DOE/EIS–0355

Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Final Environmental Impact Statement

July 2005

Volumes IV
Chapters 4–5
Comment Responses

U.S. Department of Energy

Office of Environmental Management

Contents

Volume IV

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Volume IV

Acronyms

AAVT	average annual daily traffic volume
AWQC	ambient water quality criteria
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
DOE	U.S. Department of Energy
EC	environmental concerns
EIS	environmental impact statement
EO	environmental objections
EPA	U.S. Environmental Protection Agency
EU	environmentally unsatisfactory
FEMA	Federal Emergency Management Agency
FY	fiscal year
gpm	gallons per minute
HDPE	high-density polyethylene
HEW	U.S. Department of Health, Education, and Welfare
HI	hazard index
ID	identification
IUC	International Uranium (USA) Corporation
LO	Lack of Objection
µg/L	micrograms per liter
MCMIS	Motor Carrier Management Information System
mg/L	milligrams per liter
NAS	National Academy of Sciences
NEPA	National Environmental Policy Act
NESHAPs	National Standards for Hazardous Air Pollutants
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
pCi/L	picocuries per liter
PMF	Probable Maximum Flood
RME	reasonable maximum exposure
SHPO	State Historic Preservation Officer
SOWP	Site Observational Work Plan
TDS	total dissolved solids
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UMTRCA	Uranium Mill Tailings Radiation Control Act
USF&WS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WL	working level

4.0 Responses

This section provides DOE's responses to the comments submitted during the 90-day public comment period. DOE also considered any comments received after the comment period officially ended. As in Chapter 3.0, index tables are provided to assist commentors in finding the responses to their own comments or to others' comments, including those of the cooperating agencies.

4.1 Response Index Tables

Tables 4−1, 4−2, and 4−3 parallel Tables 3−1, 3−2, and 3−3 (see Section 3.1) in structure and content. Page numbers shown in these tables refer to the page in Section 4.2 where the text of a summary comment or comment document starts, followed by DOE's response. The tables also show the page numbers in Chapter 3 where a summary comment or comment document appears.

End of current text

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15	Robins, Donna Robi	Individual	4–71	3–71
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26	Darke, John	Individual	4–84	3–75
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67	Knight, Carl	Ute Mountain Ute Tribe	4–171	3–119
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104	Lowe, Janet	Grand County	4–258	3–158
105	McCleary, Jeff	Individual	4–260	3–159
106	Thuesen, Jim	Individual	4–263	3–161
107	Regehr, Ron	Individual	4–266	3–162
108	Graham, Audrey	Individual	4–267	3–163
109	Stolfa, Dave	Individual	4–269	3–163
110	Darke, John	Individual	4–270	3–164
111	Cozzens, Dave	Individual	4–274	3–166
112	Webb, Chris	City of Blanding, City Manager	4–275	3–167
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114	Loux, Robert	Nevada Agency for Nuclear Projects	4–281	3–171
115	Broughton, B.A.	Individual	4–78	3–72
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126	Juenger, Kate	Individual	4–71	3–71
127	McCleary, Jeff and Wren	Individual	4–286	3–177
128	Jones, Patricia	Individual	4–71	3–71
129	Sculpt, Lia	Individual	4–78	3–72
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132	Smith, Loura	Individual	4–71	3–71
133	Root, Don	Individual	4–71	3–71
134	Noonan, Laura	Individual	4–78	3–72
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142	Roslund, Dan	Individual	4–71	3–71
143	Lyons, Holly	Individual	4–71	3–71
144	Rabiee, Sheryl	Individual	4–71	3–71
145	Bassik, Ken	Individual	4–71	3–71
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148	Lanphear, Michelle	Individual	4–71	3–71
149	Reinhard, Frank	Individual	4–71	3–71
150	Natkin, Jr., Robert E.	Individual	4–71	3–71
151	Whitley, Joan	Individual	4–71	3–71
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153	Lowenberg, Herman and Grace	Individual	4–71	3–71
154	Dunn, Barbara	Individual	4–71	3–71
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156	Norris, Thomas	Individual	4–71	3–71
157	Gore, Douglas	Individual	4–71	3–71
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164	Schauer, Ellen	Individual	4–71	3–71
165	Ludwigsndg	Individual	4–71	3–71
166	Warner, Rob	Individual	4–71	3–71
167	Kuhlman, David B.	Individual	4–71	3–71
168	Romero, Julie	Individual	4–78	3–72
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170	Painter, Robert, Anne, and Alexander	Individual	4–71	3–71
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172	Psichogios, Tom	Individual	4–71	3–71
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179	Corrales, Max	Individual	4–71	3–71
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181	Wildenthal, Bryan H.	Individual	4–71	3–71
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183	August, Gary	Individual	4–71	3–71
184	Rasmussen, Glen McFadden	Individual	4–71	3–71
185	Fanestil, Darrell D.	Individual	4–71	3–71
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194	Barad, Dean	Individual	4–71	3–71
195	von Eichhorn, John H.	Individual	4–71	3–71
196	valindp	Individual	4–78	3–72
197	Trogden, Stephanie	Individual	4–71	3–71
198	Gallagher, Bruce	Individual	4–71	3–71
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200	Fisher, Steve and Amanda	Individual	4–71	3–71
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202	Acerro, Theresa	Individual	4–71	3–71
203	Hughes, Tom and Lois	Individual	4–71	3–71
204	Greenspan, Julie	Individual	4–71	3–71
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219	Ringer, CE	Individual	4–71	3–71
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223	Haley, Luckie	Individual	4–71	3–71
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227	Lindbloom, Robert	Individual	4–71	3–71
228	Pluth, Karen	Individual	4–71	3–71
229	Brown, Phyllis	Individual	4–71	3–71
230	Barnard, Janet A.	Individual	4–71	3–71
231	Hayes, Jenna	Individual	4–71	3–71
232	Mifflin, Robert H.	Individual	4–78	3–72
233	Breisch, Susan	Individual	4–71	3–71
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235	Thibault, Laura	Individual	4–71	3–71
236	Weir, Barbara G. Campbell	Individual	4–71	3–71
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244	Murico, Ed	Individual	4–71	3–71
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248	Curtis, Cheryl	Individual	4–71	3–71
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250	Cooke, Sarah	Individual	4–71	3–71
251	Knighton, Jesse and Jane	Individual	4–71	3–71
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258	Leonard, John P.	Individual	4–78	3–72
259	Groth, Heidi	Individual	4–71	3–71
260	Fishman, Barbara	Individual	4–71	3–71
261	Hernandez, Greg and Lorie	Individual	4–71	3–71
262	Calvano, Rita	Individual	4–71	3–71
263	Carter, Brady	Individual	4–71	3–71
264	Oblak, Denise	Utah Guides and Outfitters Association	4–299	3–184
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266	Reed, Jess	Individual	4–78	3–72
267	Boling, William C.	Deleted-Duplicate of Document #121		
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269	David	Individual	4–302	3–186
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271	Pfeidough	Individual	4–71	3–71
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274	Angelico, Dean and Phyllis	Individual	4–71	3–71
275	Bracey, Michael	Individual	4–71	3–71
276	Irwin, Keith G.	Individual	4–71	3–71
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279	Dailey-White, Laurel	Individual	4–71	3–71
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281	Papayoanou, David C.	Individual	4–71	3–71
282	Frederick, Cari	Individual	4–71	3–71
283	Mecke, James	Individual	4–71	3–71
284	McKay, Linda	Individual	4–71	3–71
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295	Driban, Glenn	Individual	4–71	3–71
296	Ampe, Tim	Individual	4–71	3–71
297	Weston, Steve C.	Padre Dam Municipal Water District	4–71	3–71
298	Paz, Nils	Individual	4–71	3–71
299	Wayne, Vincent and Deborah	Individual	4–71	3–71
300	Johnson, Ferd	Individual	4–71	3–71
301	Rhodes, Steve	Individual	4–71	3–71
302	Wilson, Lisa	Individual	4–71	3–71
303	Garity, Tom	Individual	4–71	3–71
304	Beck, Mike and Gina	Individual	4–71	3–71
305	Chipman, Cheryl	Individual	4–71	3–71
306	McNeely, Jerry	Grand County Council	4–303	3–187
307	Darke, John	Individual	4–312	3–192
308	Brasow, Carl	Deleted-Not an EIS comment		
309	Strell, Lia	Individual	4–71	3–71
310	Anonymous 1	Individual	4–78	3–72
311	Hudack, Linda	Individual	4–71	3–71
312	Gross, Bonnie	Individual	4–71	3–71
313	Keiler, Randy	Individual	4–71	3–71
314	Petrovitch, Michael	Individual	4–78	3–72
315	Balistrary, Frank	Individual	4–71	3–71
316	Anonymous 2	Individual	4–71	3–71
317	McDaniel, Tim	Individual	4–71	3–71
318	Gomez, David	Individual	4–78	3–72
319	Hess, Carlene	Individual	4–71	3–71
320	Anderson, Jane	Individual	4–71	3–71
321	Tobario, Steve	Individual	4–71	3–71
322	Smith, Laura	Individual	4–71	3–71
323	Larson, Pete	Individual	4–71	3–71
324	Coleman, Stacy	Individual	4–71	3–71
325	Piper, David	Individual	4–71	3–71
326	Holgate, Frank	Individual	4–71	3–71
327	Laura, Diana	Individual	4–71	3–71
328	Mezlan, Bernice	Individual	4–71	3–71
329	Winston, Richard	Individual	4–71	3–71
330	Tiontek, Tana	Individual	4–71	3–71
331	Barca, Ron	Individual	4–71	3–71
332	Espanol, Joseph	Individual	4–71	3–71
333	Cohee, Terry	Individual	4–71	3–71
334	Phillips, Sally	Individual	4–71	3–71
335	Honneker, Mary	Individual	4–71	3–71
336	Schoeller, Ann	Individual	4–71	3–71
337	Falor, Beverly	Individual	4–71	3–71
338	Keliher, Pat	Individual	4–71	3–71

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343	Townsend, Roger	Individual	4–71	3–71
344	Huntsman, Jr. Jon M.	State of Utah	4-313	3–194
345	Hackley, Pam	Individual	4–316	3–196
346	Fliegel, Myron	U.S. Nuclear Regulatory Commission	4–329	3–201
347	Hess, John R.	Individual	4–71	3–71
348	Brant, Richard H.	Individual	4–71	3–71
349	Martin, Lori	Individual	4–71	3–71
350	Nelson, Karen	Individual	4–71	3–71
351	Binyon, Jean	Sierra Club, Utah Chapter	4–338	3–207
352	Pickard, Kathy	Individual	4–71	3–71
353	Hedden, Bill	Deleted-Replaced by Document #555		
354	Swisshelm, Richard	Individual	4–71	3–71
355	Moskowitz, Grant	Individual	4–71	3–71
356	Patten, Terese	Individual	4–71	3–71
357	Stolfa, Marilyn S.	Individual	4–71	3–71
358	Wyandt, Paul	Individual	4–71	3–71
359	Barker, John H.	Individual	4–71	3–71
360	Hurley, Mike and Barbara	Individual	4–71	3–71
361	Starbuck, Willaim L.	Individual	4–71	3–71
362	Lennon, Judy	Individual	4–71	3–71
363	Cherry	Individual	4–71	3–71
364	Noyes, Jessica	Individual	4–78	3–72
365	James, Todd M.	Individual	4–78	3–72
366	Choi, Joseph	Individual	4–78	3–72
367	Medina, Edgar	Individual	4–71	3–71
368	Martin, Andrea	Individual	4–78	3–72
369	Klein, Chris	Individual	4–71	3–71
370	Doty, Taylor	Individual	4–71	3–71
371	Moya, Jade	Individual	4–78	3–72
372	Murico, Donna	Individual	4–71	3–71
373	Shanske, Donna	Individual	4–78	3–72
374	Black, Steve	Individual	4–78	3–72
375	Wilk, James	Individual	4–71	3–71
376	Matheson, Jim	Deleted, never formally submitted to DOE as a comment		
377	Walsh, Justin	Individual	4–71	3–71
378	lhart	Individual	4–353	3–215
379	Harrington, John	Individual	4–71	3–71
380	Herron, Rex	Individual	4–71	3–71
381	Wilson, Susan	Individual	4–71	3–71
382	Galassini, Dina	Individual	4–71	3–71
383	Wooldridge, Forrest	Individual	4–78	3–72
384	Olazabal, Addie	EDAW, Inc.	4–71	3–71
385	Straus, Charles R.	Individual	4–71	3–71
386	Rodriguez, Faye	The Marika Group	4–71	3–71
387	Sander, Luther and Eileen	Individual	4–71	3–71
388	Blume, Donald	Individual	4–71	3–71

Table 4−1. Index of Responses by Document Number (continued)

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389	Lewis, Stephen and Mary	Individual	4–77	3–72
390	Ringer, Charles E.	Individual	4–71	3–71
391	Haselfeld, Dianne	Individual	4–71	3–71
392	Butterfield, Jean and Michael	Individual	4–71	3–71
393	Lemen, Sherry	Individual	4–78	3–72
394	Grancell, Alvin	Individual	4–78	3–72
395	Manzer, Anne	Individual	4–78	3–72
396	Oster, Delores A.	Individual	4–71	3–71
397	Vestal, Rita	Individual	4–71	3–71
398	Mira, Julia	Individual	4–71	3–71
399	Bowden, Karen	Individual	4–71	3–71
400	Bannister, Daryl	Individual	4–71	3–71
401	Rouse, Bronwyn M.	Individual	4–78	3–72
402	Binyon, Michael L.	Individual	4–71	3–71
403	Rutledge, Barbara	Individual	4–78	3–72
404	Inskip, Eleanor	Individual	4–71	3–71
405	Vega III, Vladimir	Individual	4–78	3–72
406	Alton, Diane	Individual	4–71	3–71
407	Andykaz	Individual	4–71	3–71
408	Seymour, Richard and Barbara	Individual	4–71	3–71
409	Thompson, David A.	Kearny High Educational Center	4–71	3–71
410	Welch, Dana Franklin	Individual	4–71	3–71
411	Weiler, Geoffrey and Elizabeth	Individual	4–71	3–71
412	Messenger, Thomas J.	Individual	4–71	3–71
413	Peppin, Kip	Individual	4–71	3–71
414	Kanwischer, Kari	Individual	4–71	3–71
415	Thompson, Eleanor	Individual	4–71	3–71
416	Mnichowski, Brittany	Individual	4–71	3–71
417	Thompson, David	San Diego Community College District	4–71	3–71
418	Peck, Vera	Individual	4–71	3–71
419	M, Ana	Individual	4–71	3–71
420	Martin, Eric	Individual	4–71	3–71
421	Thompson, Mr.	Kearny High School	4–71	3–71
422	Dreifuss, Jeanine	Shiley Center for Orthopaedic	4–71	3–71
423	Jouflas, Sandy Hughes	Individual	4–71	3–71
424	Barton, John and Mildred	Individual	4–71	3–71
425	Jett, Lynne	Individual	4–71	3–71
426	Marks, Chris	Individual	4–71	3–71
427	Stafford, Richard A.	Individual	4–356	3–216
428	Rice, Tom	Deleted-Duplicate of Document #549		
429	Dohrenwend, John C.	University of Arizona	4–360	3–219
430	Chorpenning, Patrick	Individual	4–71	3–71
431	Smith, Hector	Individual	4–71	3–71
432	Moore, Amanda	Individual	4–71	3–71
433	Kain, Nancy	Individual	4–361	3–235
434	Showalter, Patricia	Individual	4–71	3–71
435	Curley, Patricia L.	Individual	4–78	3–72
436	Kiffmeyer, Donald	Individual	4–71	3–71

Table 4−1. Index of Responses by Document Number (continued)

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437	Spensley, June	Individual	4–71	3–71
438	Ambrose, Laura, Jeff, Brett, and Cole	Individual	4–71	3–71
439	Lilskippy	Individual	4–71	3–71
440	Lenards, Steve	Individual	4–78	3–72
441	Holenstein, Christian	Individual	4–71	3–71
442	Berryhill, Tamarah	Individual	4–71	3–71
443	Palmer, Anita	Point Loma Nazarene University	4–71	3–71
444	Owens, Stephen A.	Arizona Department of Environmental Quality	4–362	3–236
445	Stapleton, Maureen A.	San Diego County Water Authority	4–370	3–241
446	Nelson, Charles	Individual	4–372	3–242
447	Anonymous San Diego	Individual	4–78	3–72
448	Hunnington, Arthur	Individual	4–71	3–71
449	Stark, Carol	Individual	4–71	3–71
450	Beeman, Daniel	Individual	4–71	3–71
451	Wilson, Jennifer	Individual	4–71	3–71
452	Nichols, Joe	Individual	4–71	3–71
453	Yuskin, Joe	Individual	4–71	3–71
454	Stark, John	Individual	4–71	3–71
455	Dickerman, Karen	Individual	4–71	3–71
456	Noyes, Kirt	Individual	4–71	3–71
457	Phillips, Mauricette	Individual	4–71	3–71
458	MCL Studio	Individual	4–71	3–71
459	Olivas, Nelson	Deleted-Not an EIS comment		
460	McDonough, Nora Jane	Individual	4–78	3–72
461	Young, Ruby	Individual	4–71	3–71
462	Jenkins, Sharon	Individual	4–71	3–71
463	Rosenwald, Althia	Individual	4–71	3–71
464	Honecker, Carl	Individual	4–71	3–71
465	Wooley, Carol	Individual	4–71	3–71
466	Spicer, Duane	Individual	4–71	3–71
467	Leer, Joanne	Individual	4–71	3–71
468	Schafer, Laura	Individual	4–71	3–71
469	Foletta, Lorel	Individual	4–78	3–72
470	Adams, Muriel	Individual	4–71	3–71
471	Orr, Nancy	Individual	4–71	3–71
472	Wagner, Steve	Individual	4–71	3–71
473	Brown, Virginia	Individual	4–71	3–71
474	Little, Andrea	Individual	4–71	3–71
475	Bruckell, Cindy	Individual	4–71	3–71
476	Emerine, Connie	Individual	4–71	3–71
477	Anonymous Feb 16	Individual	4–71	3–71
478	Anonymous 1 Feb 16	Individual	4–71	3–71
479	Wayne, Erica	Individual	4–71	3–71
480	Vairo, Inge	Individual	4–71	3–71
481	Burnett, Jake	Individual	4–71	3–71
482	Cosmeadodge, Katherine	Individual	4–71	3–71
483	Lewis, Lois & Laurence	Individual	4–71	3–71
484	Bose, Norman	Individual	4–71	3–71

Table 4−1. Index of Responses by Document Number (continued)

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485	Molina, Roxanne	Individual	4–71	3–71
486	McCain, Suzanne	Individual	4–71	3–71
487	Wynn, Tina	Individual	4–71	3–71
488	Sakrison, Dave	City of Moab, Mayor	4–373	3–244
489	Williams, Christy	KZMU	4–71	3–71
490	Mello, Fran	Individual	4–78	3–72
491	Tiwald, William	Individual	4–71	3–71
492	Nordling, Thea	Individual	4–71	3–71
493	mtb35	Individual	4–71	3–71
494	Cross, Janice	Individual	4–71	3–71
495	See, Steve	Individual	4–71	3–71
496	Schubert, Gabriele	Individual	4–71	3–71
497	Schroeder, Rosemary	Individual	4–71	3–71
498	Pearson, Candee	Individual	4–71	3–71
499	McDougal, Michele	McDougal & Associates	4–71	3–71
500	Anthony, Linda R.	Individual	4–71	3–71
501	Lovell, Cecila	Individual	4–71	3–71
502	McGrath, Anne S.	Individual	4–71	3–71
503	Stratton, Bill and Ferne	Individual	4–71	3–71
504	Suarez, Michael K.	Individual	4–380	3–247
505	Suarez, Mary	Individual	4–382	3–248
506	Corson, Katherine E.	Individual	4–71	3–71
507	Brinn, Charlene	Individual	4–71	3–71
508	Conklin, Diane	Individual	4–71	3–71
509	Stapleton, Maureen	Deleted-Not an EIS comment		
510	DuBois, William	Individual	4–71	3–71
511	Schettler, Robert	Individual	4–71	3–71
512	Josepho, Mary	Individual	4–71	3–71
513	Marshall, Jan & Jim	Individual	4–71	3–71
514	Wiltse, David	Individual	4–71	3–71
515	Millard, Charles	Individual	4–384	3–249
516	Case, Patricia	Individual	4–71	3–71
517	Breneman Jr., Tom	Individual	4–71	3–71
518	Belcher, Barbara	Century 21 Carole Realty	4–71	3–71
519	James, Gordon	Individual	4–78	3–72
520	Julian, Christian	Individual	4–71	3–71
521	Williams, Patty Ann	Individual	4–71	3–71
522	Dahl, Teresa & Marvin	Individual	4–71	3–71
523	Kosek, Shirley	Individual	4–71	3–71
524	Gleason, Vern & Lois	Individual	4–71	3–71
525	Bishop, Louise & Donn	Individual	4–71	3–71
526	Schechter, Ann & John	Individual	4–71	3–71
527	Tielens, Arthur J.	A.J. Tielens and Associates	4–386	3–250
528	Reed, Jess	Deleted-Not an EIS comment		
529	Bennett, Larry E.	Individual	4–71	3–71
530	Hughes, Billie Lois	Individual	4–71	3–71
531	Rubacalva, Manuela	Individual	4–71	3–71
532	Jackson, Henry & Jane	Individual	4–71	3–71
533	Woodfin, Debbie	Individual	4–71	3–71
534	Angel, Bradley	Greenaction for Health & Environmental Justice	4–71	3–71

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535	Moran, Mary	Individual	4–388	3–253
536	LeMontre, Sue	Individual	4–397	3–257
537	Maia, Maia	Individual	4–398	3–258
538	Leuk, Sue	Individual	4–71	3–71
539	Rivera, Madeline	Individual	4–399	3–259
540	Trenholme, Howard	Individual	4–71	3–71
541	Yancey, William B.	Individual	4–71	3–71
542	Tran, Thuy	Individual	4–71	3–71
543	Kain, Karen	Individual	4–71	3–71
544	Park, Conor	Individual	4–71	3–71
545	Pucillo, Steve	Individual	4–71	3–71
546	Dhsurf	Individual	4–71	3–71
547	Angel, Bradley	Green Action	4–400	3–260
548	Bauman, Valeria	Individual	4–71	3–71
549	Whiteskunk, Selwyn	Ute Mountain Ute Tribe	4–401	3–261
550	Brown, Frederick	Individual	4–71	3–71
551	Crick, Tim & Victoria	Individual	4–71	3–71
552	Dotson, Virgina	Individual	4–71	3–71
553	Underwood, Dennis	Metropolitan Water District of Southern California	4–411	3–272
554	Browne, Robert	Individual	4–71	3–71
555	Hedden, Bill	Grand Canyon Trust	4–426	3–295
556	Hartsfield, Sam	Port of Portland	4–457	3–312
557	Members of Congress[b]	Congress of the United States	4–458	3–313
558	Nielson, Dianne R.	Utah Department of Environmental Quality	4–461	3–316
559	Rosson, Clay	Individual	4–537	3–357
560	Carlson, Virginia	Individual	4–541	3–359
561	Braun, Joseph	Individual	4–71	3–71
562	Brown, Darcey	Individual	4–71	3–71
563	Bryant, Gary	Individual	4–71	3–71
564	Davis, Donna	Individual	4–71	3–71
565	Arnold, Chris	Individual	4–71	3–71
566	Snyder, Philip	Individual	4–71	3–71
567	Lynch, Esq. Robert	Irrigation & Electrical Districts Association of Arizona	4–551	3–362
568	Weisheit, John	Living Rivers and Colorado Riverkeeper	4–553	3–364
569	Eininger, Sue	Individual	4–71	3–71
570	Bauman, Sarah	Individual	4–71	3–71
571	Crysdale, Bonnie	Individual	4–71	3–71
572	Indergard, RG Lantz M.	Individual	4–565	3–369
573	Fong, P.E., Leighton	Glendale Water & Power	4–569	3–374
574	Roberts, Robert E.	U.S. Environmental Protection Agency	4–570	3–375
575	Ferrell, Jean	N. N. Jaeschke, Inc.	4–71	3–71
576	Goddard, Monica	Individual	4–71	3–71
577	Babbitt, James	Individual	4–71	3–71
578	Moody, Tom	Natural Channel Design, Inc.	4–71	3–71
579	Bliss, Eleanor	Individual	4–71	3–71
580	Babcock, Arlinda & Jeffrey	Individual	4–71	3–71
581	Nyman, Michael	Individual	4–71	3–71

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582	Lamm, Dorothy & Ken	Individual	4–71	3–71
583	Lebkuecher, Steve	Individual	4–71	3–71
584	Paulson, Pamela	Individual	4–71	3–71
585	Belkin, Alan	Individual	4–71	3–71
586	Lewis, Sandy & Mel	Individual	4–71	3–71
587	Farrari, Kimberly	Individual	4–71	3–71
588	Goldstein, Candace	Individual	4–71	3–71
589	Cavendish, Abbey	Individual	4–71	3–71
590	Grantham, Jerald	Individual	4–71	3–71
591	Nordby, Vonnie	MyDAS, Inc.	4–78	3–72
592	Gleason, Bill & Donna	Individual	4–71	3–71
593	Deanna	Mesa Verde Middle School	4–71	3–71
594	Edwards, David & Linda	Individual	4–78	3–72
595	Bates, Hedda	Individual	4–71	3–71
596	Desai, Kinjal	Individual	4–71	3–71
597	Carlson, Jim	Individual	4–71	3–71
598	Keeler, Bruce	Red River Canoe Company	4–633	3–402
599	Goegel, Moira	Individual	4–71	3–71
600	Cross, Dale	Individual	4–71	3–71
601	Drogin, Alice	Individual	4–71	3–71
602	Paterson, Lisa	Individual	4–635	3–403
603	Metzler, Allison	Individual	4–71	3–71
604	Lucisano, Dominic	Mesa Verde Middle School	4–71	3–71
605	Keating, Riley	Individual	4–71	3–71
606	Kirtley, Dennie	Individual	4–71	3–71
607	Lui, Samantha	Individual	4–71	3–71
608	Silva, Dennis	Individual	4–71	3–71
609	Santillo, Richard	Individual	4–71	3–71
610	O'Grady, Jean	Individual	4–71	3–71
611	Anderson, Wayne	Individual	4–71	3–71
612	VanderZanden, Karla	Canyonlands Field Institute	4–71	3–71
613	Z, Ariana	Mesa Verde Middle School	4–71	3–71
614	Cantrell, Chase	Individual	4–71	3–71
615	Bowles, Sharon	Individual	4–71	3–71
616	Hartge, Torie	Individual	4–71	3–71
617	Rodeheaver, Vonda	Individual	4–71	3–71
618	Watkins, Cameron	Individual	4–71	3–71
619	Hagen, Melena	Individual	4–71	3–71
620	Lewis, Bradley	Individual	4–71	3–71
621	Murahovscaia, Nadejda	Point Loma Nazarene University	4–71	3–71
622	Bowles, Philip	Individual	4–71	3–71
623	Johnston, Ashley	Individual	4–71	3–71
624	Irwin, Constance	Point Loma Nazarene University	4–71	3–71
625	Barker, James	Individual	4–71	3–71
626	Wu, John	Individual	4–71	3–71
627	Giannini, James	Individual	4–71	3–71
628	Cranmer, Jana	Point Loma Nazarene University	4–71	3–71
629	Ovando-Knutson, Cynthia	Point Loma Nazarene University	4–71	3–71

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631	Lazaro, Melissa	Individual	4–71	3–71
632	Moser, Alicia	Individual	4–71	3–71
633	Mickle, Joanna	Individual	4–71	3–71
634	Rabello, Dianne	Point Loma Nazarene University	4–71	3–71
635	Jafry, Patricia	Individual	4–71	3–71
636	May, Myrna	Individual	4–71	3–71
637	Gates, Jamie	Individual	4–71	3–71
638	Peterson, Tara	Individual	4–71	3–71
639	Pagan, Beryl	Individual	4–71	3–71
640	Atkins, Dr. Sue	Point Loma Nazarene University	4–71	3–71
641	Leon, Susie	Individual	4–71	3–71
642	Northam, Elizabeth	Individual	4–71	3–71
643	Sandoval, Gerardo	Individual	4–71	3–71
644	Street, Stacey	Klassen Hall	4–71	3–71
645	Mentzer, Danielle	Klassen Hall	4–71	3–71
646	Davis, Jesse	Individual	4–71	3–71
647	Gregg, Julie	Individual	4–71	3–71
648	Loyko, Megan	Individual	4–71	3–71
649	Serrano, Indra	Finch Hall A-2	4–71	3–71
650	Allen, Aimee	Individual	4–71	3–71
651	Pedersen, Dr. Keith	Point Loma Nazarene University	4–71	3–71
652	Horak, Benjamin	Individual	4–71	3–71
653	Maier, Jean	Individual	4–71	3–71
654	Pilewski, Laura	Individual	4–71	3–71
655	dwhittemore	Individual	4–78	3–72
656	Goldman, Richard	Individual	4–71	3–71
657	Nyman, Suiko Dam	Individual	4–71	3–71
658	Groenewold, Jason	Healthy Environment Alliance of Utah	4–71	3–71
659	McCarn, Dan	Individual	4–71	3–71
660	Coffey, Chris	Individual	4–71	3–71
661	Giffin, Patty	Individual	4–71	3–71
662	Roberts, Harold	International Uranium (USA) Corporation	4–636	3–404
663	Goddard, Terry	Office of the Attorney General	4–650	3–412
664	Bennett, Dr. Jean	Individual	4–71	3–71
665	Noyes, Kurt	Individual	4–71	3–71
666	Smith, Margaret	Individual	4–71	3–71
667	Gregory, Jeannie	San Diego Natural History Museum	4–71	3–71
668	Martin, Andrea	Individual	4–71	3–71
669	Kamala, Laura	Grand Canyon Trust	4–652	3–413
670	Hodge, Gordon	Individual	4–71	3–71
671	Osborne, Ken	Individual	4–71	3–71
672	Peschong, Jon	Duratek Federal Services	4–654	3–414
673	Clark, Monette	Individual	4–655	3–415
674	Stoker, David	Individual	4–71	3–71
675	Ting, Jantrue	Individual	4–71	3–71

Table 4−1. Index of Responses by Document Number (continued)

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676	Smith, Stephen	Individual	4–71	3–71
677	Jones, Kalen	Individual	4–71	3–71
678	Stolfa, Dave	Individual	4–71	3–71
679	Melious, Rachele	Individual	4–71	3–71
680	Zapotocky, David	Individual	4–71	3–71
681	Chan, Victor	Individual	4–71	3–71
682	Rayner, Lisa	Individual	4–71	3–71
683	Underhill, Janice	Individual	4–71	3–71
684	Weber, Ivan	Weber Sustainability Consulting	4–659	3–417
685	Bain, Frank	Individual	4–71	3–71
686	Hess, John	Individual	4–71	3–71
687	Harvey, Sally	Individual	4–71	3–71
688	Chambliss, Jessie B.	Deleted-Not an EIS comment		
689	McNeely, Jerry	Grand County Council	4–667	3–421
690	Sjostedt, Susanne	Deleted-Not an EIS comment		
691	Bleakley, Caroline	Deleted-Not an EIS comment		
692	Capano, Sandra and Richard	Individual	4–71	3–71
693	Csanadi, William C. and Beata M.	Individual	4–71	3–71
694	Bifulci, Danielle	Individual	4–71	3–71
695	Doran, Liza	Individual	4–71	3–71
696	Bruno, Jeanne-Marie	Park Water Company	4–675	3–426
697	Ostler, Jim	Individual	4–71	3–71
698	Pope, Carl	Sierra Club	4–71	3–71
699	Livermore, Dave and Bellagamba, Susan	The Nature Conservancy	4–677	3–427
700	McEwen, Marjorie Larock	Individual	4–71	3–71
701	LaBlond, Juanita E.	Individual	4–71	3–71
702	Kent, Dan	Red Rocks Forest	4–71	3–71
703	Chalmers, Diana	Individual	4–71	3–71
704	Terebey, Nicholas	Individual	4–71	3–71
705	Mercandetti, Ann E. Smith	Individual	4–71	3–71
706	Fields, Sarah M.	Glen Canyon Group	4–691	3–434
707	Fields, Sarah M.	Individual	4–733	3–466
708	Anonymous 5	Individual	4–78	3–72
709	Alsup, Adel	Individual	4–71	3–71
710	McLeod, Al	Individual	4–71	3–71
711	Regier, Alex	Individual	4–71	3–71
712	Stiff, Anna	Individual	4–71	3–71
713	Anonymous 6	Individual	4–71	3–71
714	Cuba, Bernice	Individual	4–71	3–71
715	Anonymous 7	Individual	4–71	3–71
716	Anonymous 8	Individual	4–71	3–71
717	Anonymous 9	Individual	4–71	3–71
718	Foster, Anthony	Individual	4–71	3–71
719	Celine, Audrey	Individual	4–71	3–71
720	Milner, Cynthia	Individual	4–71	3–71
721	Smith, Cynthia	Individual	4–71	3–71
722	Coram, Betty	Individual	4–71	3–71
723	Celine, Sherry	Individual	4–71	3–71
724	Hao, Chong	Individual	4–71	3–71

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725	Cohen, Connie	Individual	4–71	3–71
726	Seawell, Earnest N.	Individual	4–71	3–71
727	Lill, Dave	Individual	4–71	3–71
728	Everist, David	Individual	4–71	3–71
729	King, Deanna	Individual	4–71	3–71
730	Rounkles, Diane	Individual	4–78	3–72
731	Freed, Doris	Individual	4–71	3–71
732	Chen, Jay	Deleted-Not an EIS comment		
733	Marillo, Eve	Individual	4–71	3–71
734	Moore, Evelyn	Individual	4–78	3–72
735	Houston, Gail	Individual	4–71	3–71
736	Bennett, James	Individual	4–78	3–72
737	Austin, Janina	Individual	4–71	3–71
738	Taylor, Joanne A.	Individual	4–71	3–71
739	Yonker, Joanne	Individual	4–71	3–71
740	John	Individual	4–71	3–71
741	Cafry, John	Individual	4–71	3–71
742	Stewart, Katherine	Individual	4–71	3–71
743	Woodard, Joan	Individual	4–71	3–71
744	Sharon	Individual	4–71	3–71
745	Hotchkiss, Lita	Individual	4–78	3–72
746	Barker, M. J.	Individual	4–71	3–71
747	Burke, Mack	Individual	4–71	3–71
748	Leason, Mark	Individual	4–71	3–71
749	Drogin, Ken	Individual	4–71	3–71
750	Duncan, Michael	Individual	4–71	3–71
751	McDougal, Michele	Individual	4–71	3–71
752	Wurth, Michelle	Individual	4–71	3–71
753	Blair, Patricia	Individual	4–71	3–71
754	Huckaby, Marlene	Individual	4–71	3–71
755	Reed, Mary	Individual	4–71	3–71
756	Mattewson, Phillip L.	Individual	4–71	3–71
757	Stern, Rochelle	Individual	4–78	3–72
758	Karcher, Samuel	Individual	4–71	3–71
759	Hughes, Sandy & Harold	Individual	4–71	3–71
760	Suplee, Serena	Individual	4–71	3–71
761	Woodard, Patty	Individual	4–78	3–72
762	Fugit, Victoria	Individual	4–71	3–71
763	Rains, Gail	Individual	4–79	3–72
764	Armour, Peggy	Individual	4–79	3–72
765	St Raynis	Individual	4–79	3–72
766	Singer, Kay	Individual	4–79	3–72
767	Stefanow, Jennifer	Individual	4–79	3–72
768	Paley, Jan	Individual	4–79	3–72
769	Griffith, Dian	Individual	4–79	3–72
770	McCloud, Russell	Individual	4–79	3–72
771	Bauchau, Clara	Individual	4–79	3–72
772	Bauchau, Mijanou	Individual	4–79	3–72
773	Bauchau, Enduit	Individual	4–79	3–72
774	English, Rebecca	Individual	4–79	3–72
775	Villavicencio, Alan	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
776	Moore, Kristie	Individual	4–79	3–72
777	G.H., Sara	Individual	4–79	3–72
778	Anderson, Ellen	Individual	4–79	3–72
779	Hoyt, Jennifer	Individual	4–79	3–72
780	Manto, Jonathan	Individual	4–79	3–72
781	Ross, Aimee	Individual	4–79	3–72
782	Dukes, John	Individual	4–79	3–72
783	Stewart, Diane	Individual	4–79	3–72
784	Freel, Elizabeth Sloan	Individual	4–79	3–72
785	Orcholski, Gerald	Individual	4–79	3–72
786	Holmes, Ronald	Individual	4–79	3–72
787	Minde, Cynthia	Individual	4–79	3–72
788	Williams, Susan	Individual	4–79	3–72
789	Curnow, Connie	Individual	4–79	3–72
790	Barnard, Michele L.	Individual	4–79	3–72
791	Stokes, Debra	Individual	4–79	3–72
792	Petrowski, Todd	Individual	4–79	3–72
793	Lisi, Julius	Individual	4–79	3–72
794	Carr, Donna	Individual	4–79	3–72
795	Kempter, Shahido	Individual	4–79	3–72
796	Morris, Ray	Individual	4–79	3–72
797	Marshall, Sandy	Individual	4–79	3–72
798	Loeff, Peter	Individual	4–79	3–72
799	Glazer, Steve	Individual	4–79	3–72
800	Reyes, Fran	Individual	4–79	3–72
801	Berliner, Diane	Individual	4–79	3–72
802	Granich, Sandra	Individual	4–79	3–72
803	Spallina, Jann	Individual	4–79	3–72
804	Thompson, Stephen	Individual	4–79	3–72
805	McLaughlin, Laurie	Individual	4–79	3–72
806	Bruner, Scott M.	Individual	4–79	3–72
807	Key, Lonnie	Individual	4–79	3–72
808	Hoffman, Wendy	Individual	4–79	3–72
809	Slawson, Camly	Individual	4–79	3–72
810	Albright, Evan	Individual	4–79	3–72
811	Wagoner, Robyn	Individual	4–79	3–72
812	Clark, Frances	Individual	4–79	3–72
813	Garcia, Jeffery A.	Individual	4–79	3–72
814	Bassett, Anne	Individual	4–79	3–72
815	Lo, Donovan	Individual	4–71	3–71
816	Munk, David	Individual	4–79	3–72
817	Schneider, Marilyn	Individual	4–79	3–72
818	Clark, Pamela	Individual	4–79	3–72
819	Dowling, Anna	Individual	4–79	3–72
820	Springer, Paul	Individual	4–79	3–72
821	Niel, Roma	Individual	4–79	3–72
822	Johnson, Emily	Individual	4–79	3–72
823	Rocker, Carol	Individual	4–79	3–72
824	Moore, Estella	Individual	4–79	3–72
825	Aguilar, Felix	Individual	4–79	3–72
826	Kosmicki, Teresa	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
827	Quinn, April	Individual	4–79	3–72
828	De Morelli, David	Individual	4–79	3–72
829	Schacht, Troy	Individual	4–79	3–72
830	Coburn, Bruce	Individual	4–79	3–72
831	Walworth, David	Individual	4–79	3–72
832	Gaede, Marnie	Individual	4–79	3–72
833	Gale, Jennifer	Individual	4–79	3–72
834	Peirce, Roger	Individual	4–79	3–72
835	Luedecke, Alison J.	Individual	4–79	3–72
836	Koo, Rebecca	Individual	4–79	3–72
837	Shanahan, Timothy	Individual	4–79	3–72
838	Loar, Carol	Individual	4–79	3–72
839	Robison, Anne	Individual	4–79	3–72
840	Bell, Ray	Individual	4–79	3–72
841	O'Shea, Desmond	Individual	4–79	3–72
842	Ackerman, Frank A.	Individual	4–79	3–72
843	Emery, Michael	Individual	4–79	3–72
844	Hahn, Dr. Dee	Individual	4–79	3–72
845	Garrett, Katherine	Individual	4–79	3–72
846	Shively, Kelly	Individual	4–79	3–72
847	Scotti, O. Bisogno	Individual	4–79	3–72
848	Apkarian, Jennifer	Individual	4–79	3–72
849	Goldstein, Judith	Individual	4–79	3–72
850	Nicolaisen, Jaime	Individual	4–79	3–72
851	Provenzano, James	Individual	4–79	3–72
852	Perry, Mary Ann Tomasko	Individual	4–79	3–72
853	Galello, Pat	Individual	4–79	3–72
854	Baker, Connie	Individual	4–79	3–72
855	Berman, Nancy	Individual	4–79	3–72
856	Robinson, Saliane	Individual	4–79	3–72
857	Weinhold, Robert	Individual	4–79	3–72
858	Anderson, Russ	Individual	4–79	3–72
859	Riddell, John	Individual	4–79	3–72
860	Lynn, Sheree	Individual	4–79	3–72
861	Wallace, Sondra	Individual	4–79	3–72
862	Kurz, Robert R.	Individual	4–79	3–72
863	Lippert, Virginia	Individual	4–79	3–72
864	Kaplan, Morris	Individual	4–79	3–72
865	Bailey, Ellen	Individual	4–79	3–72
866	Adkins, Elizabeth	Individual	4–79	3–72
867	Ross, Marie	Individual	4–79	3–72
868	Lewis, Gail	Individual	4–79	3–72
869	Indermuehle, Timothy	Individual	4–79	3–72
870	Lawrence, Vicki	Individual	4–79	3–72
871	Weiner, Maury	Individual	4–79	3–72
872	Miller, Nathan A.	Individual	4–79	3–72
873	Zeissler, Chandra	Individual	4–79	3–72
874	Januzelli, David	Individual	4–79	3–72
875	Henze, Christine	Individual	4–79	3–72
876	Odin, Jane	Individual	4–79	3–72
877	Reed, Lisa	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
878	Wenner, M. W.	Individual	4–79	3–72
879	Masters, Athena	Individual	4–79	3–72
880	Nolte, Linda PhD,	Individual	4–79	3–72
881	Lyman, Anne	Individual	4–79	3–72
882	Goggins, Alan	Individual	4–79	3–72
883	Bryan, D.	Individual	4–79	3–72
884	Stratford, S. J.	Individual	4–79	3–72
885	Rieber, Emily	Individual	4–79	3–72
886	Landau, D.	Individual	4–79	3–72
887	Frazier, Anne	Individual	4–79	3–72
888	Werner, Kirstyn	Individual	4–79	3–72
889	Greeson, Kathryn	Individual	4–79	3–72
890	Busse, Barbara	Individual	4–79	3–72
891	Watkins, Billie	Individual	4–79	3–72
892	Richards, Susan	Individual	4–79	3–72
893	Healy, Leah	Individual	4–79	3–72
894	Hall, Brook & Linda	Individual	4–79	3–72
895	Weller, Ross	Individual	4–79	3–72
896	Sears, Michael	Individual	4–79	3–72
897	Manewal, William	Individual	4–79	3–72
898	McDermott, Ann	Individual	4–79	3–72
899	Nacheff, Marni	Individual	4–79	3–72
900	Ruegg, Leona	Individual	4–79	3–72
901	Feuer, Heather	Individual	4–79	3–72
902	Stewart, Richard	Individual	4–79	3–72
903	Griest, Fred	Individual	4–79	3–72
904	Ransom, Jill	Individual	4–79	3–72
905	Bowman, Nan Singh	Individual	4–79	3–72
906	Liese, Suzanne	Individual	4–79	3–72
907	Harris, Kelly	Individual	4–79	3–72
908	Caico, Anthony	Individual	4–79	3–72
909	Warren, Betsie	Individual	4–79	3–72
910	Cooney, Erin	Individual	4–79	3–72
911	Confectioner, Vira	Individual	4–79	3–72
912	Anelli, Darla	Individual	4–79	3–72
913	Reich, Andrew	Individual	4–79	3–72
914	Jenkins, Basil	Individual	4–79	3–72
915	Brown, Ronald	Individual	4–79	3–72
916	Bretz, William	Individual	4–79	3–72
917	Klohr, Antonia	Individual	4–79	3–72
918	Bousseau, M.	Individual	4–79	3–72
919	Root, Charlene	Individual	4–79	3–72
920	Bowman, Margaret	Individual	4–79	3–72
921	Speer, Kirsten	Individual	4–79	3–72
922	Maccallum, Crawford	Individual	4–79	3–72
923	Cramer, Mary Ann	Individual	4–79	3–72
924	Aguirre, Patricia	Individual	4–79	3–72
925	Day-Evers, Julianne	Individual	4–79	3–72
926	Griffithq, Dian	Individual	4–79	3–72
927	Melin, Ronnie	Individual	4–79	3–72
928	Palmer, Mara	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
929	Faich, Ron	Individual	4–79	3–72
930	Millhollen, Candice	Individual	4–79	3–72
931	Dougherty, Mona	Individual	4–79	3–72
932	Scott, Sidney Ramsden	Individual	4–79	3–72
933	Harrod, Katherine	Individual	4–79	3–72
934	Wiser, Steven J.	Individual	4–79	3–72
935	Brittenbach, Dennis	Individual	4–79	3–72
936	Morton, Jeffery	Individual	4–79	3–72
937	Harrour, Linda	Individual	4–79	3–72
938	Herman, Kathy	Individual	4–79	3–72
939	Kaehn, Max	Individual	4–79	3–72
940	Graham, Kimberley	Individual	4–79	3–72
941	V, Sakura	Individual	4–79	3–72
942	Miller, Paul	Individual	4–79	3–72
943	Waldref, Lois	Individual	4–79	3–72
944	Tracey, Kayta	Individual	4–79	3–72
945	Keeney, Sharon	Individual	4–79	3–72
946	Dunn, Sheryl	Individual	4–79	3–72
947	Claudio, Hereen	Individual	4–79	3–72
948	Young, Chad	Individual	4–79	3–72
949	Shockley, Mark	Individual	4–79	3–72
950	Gardiner, Shayna	Individual	4–79	3–72
951	Levin, Robert	Individual	4–79	3–72
952	Spensley, Gail	Individual	4–79	3–72
953	Youngson, Patricia	Individual	4–79	3–72
954	Harper, Mark	Individual	4–79	3–72
955	Perryman, Joann	Individual	4–79	3–72
956	Schweitzer, Hilde	Individual	4–79	3–72
957	Dameron, Susan	Individual	4–79	3–72
958	Chavez, Kerry	Individual	4–79	3–72
959	Carr, Gaile & Bob	Individual	4–79	3–72
960	McKuhen, Susan	Individual	4–79	3–72
961	Anderson, Clifford	Individual	4–79	3–72
962	Heinrichsdorff, G.	Individual	4–79	3–72
963	Kerr, Barbara	Individual	4–79	3–72
964	Jenkins, Jon	Individual	4–79	3–72
965	Rolland, Terri	Individual	4–79	3–72
966	Bertetta, Thomas	Individual	4–79	3–72
967	Gibson, Jim	Individual	4–79	3–72
968	Sutphin, Madelaine	Individual	4–79	3–72
969	Frank, Lee	Individual	4–79	3–72
970	Levy, Mark	Individual	4–79	3–72
971	Taylor, Robert	Individual	4–79	3–72
972	France, Catherine	Individual	4–79	3–72
973	Holland, Patrick W.	Individual	4–79	3–72
974	Banoczy, Jennifer	Individual	4–79	3–72
975	Van Zee, Drew	Individual	4–79	3–72
976	Piloyan, Diana	Individual	4–79	3–72
977	Feldman, Mark	Individual	4–79	3–72
978	Bright, Jeff	Individual	4–79	3–72
979	Enevoldsen, David	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
980	Olson, Ruth	Individual	4–79	3–72
981	La Follette, Peter	Individual	4–79	3–72
982	Brzeczek, Amy	Individual	4–79	3–72
983	Moore, Lynne	Individual	4–79	3–72
984	Marine, Duke	Individual	4–79	3–72
985	Dee, Diana	Individual	4–79	3–72
986	Cavallo, Sharon	Individual	4–79	3–72
987	Daniels, Patricia	Individual	4–79	3–72
988	Gonzalez, Autumn	Individual	4–79	3–72
989	Muller, Audrey	Individual	4–79	3–72
990	Silvers, Catherine	Individual	4–79	3–72
991	Crowley, Lawrence	Individual	4–79	3–72
992	Bennett, Jean	Individual	4–79	3–72
993	Tonsberg, B.	Individual	4–79	3–72
994	Greenman, Jessea	Individual	4–79	3–72
995	Brost, Hety	Individual	4–79	3–72
996	Follingstad, Gretel	Individual	4–79	3–72
997	Brown, Kimberley	Individual	4–79	3–72
998	Edmonson, Scott	Individual	4–79	3–72
999	Buech, Heidi	Individual	4–79	3–72
1000	Lewis, Donna	Individual	4–79	3–72
1001	Morander, Billy	Individual	4–79	3–72
1002	Strauss, Mark	Individual	4–79	3–72
1003	Shaw, Michael	Individual	4–79	3–72
1004	Sebastian, Joseph	Individual	4–79	3–72
1005	Sakacs, John	Individual	4–79	3–72
1006	Perkins, Randi	Individual	4–79	3–72
1007	Rose, Pandora	Individual	4–79	3–72
1008	Ferguson, Tom	Individual	4–79	3–72
1009	Tom, Janette	Individual	4–79	3–72
1010	Rucker, Christi	Individual	4–79	3–72
1011	Scianna, Maria	Individual	4–79	3–72
1012	Bordenave, Michael	Individual	4–79	3–72
1013	Brennan, Matt	Individual	4–79	3–72
1014	Williams, Charles	Individual	4–79	3–72
1015	Brush, Debbie	Individual	4–79	3–72
1016	Collins, Sandra	Individual	4–79	3–72
1017	Larkin, Laura	Individual	4–79	3–72
1018	Boer, Evert	Individual	4–79	3–72
1019	Terhune, Jennifer	Individual	4–79	3–72
1020	Chan, Kai	Individual	4–79	3–72
1021	Swan, Rebecca	Individual	4–79	3–72
1022	Harte, Mary Ellen	Individual	4–79	3–72
1023	Pierce, Roger	Individual	4–79	3–72
1024	Futral, Joel	Individual	4–79	3–72
1025	Ackerman, Beverly	Individual	4–79	3–72
1026	Feijo, Babi	Individual	4–79	3–72
1027	Jelinek, Alex	Individual	4–79	3–72
1028	Sigmund, Chandra	Individual	4–79	3–72
1029	Laporte, Ryan	Individual	4–79	3–72
1030	Pier, Mollie	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1031	Caton, Barbara	Individual	4–79	3–72
1032	Smith-Hileman, Joanne	Individual	4–79	3–72
1033	Overholt, Roger	Individual	4–79	3–72
1034	Peterson, Kimberly	Individual	4–79	3–72
1035	Williams, Bob	Individual	4–79	3–72
1036	Anderson, Jeffry	Individual	4–79	3–72
1037	Hall, Sarah Jane	Individual	4–79	3–72
1038	Johnson, John	Individual	4–79	3–72
1039	Lareau, Audrey	Individual	4–79	3–72
1040	Kennedy, Bill	Individual	4–79	3–72
1041	Dillon, Deb	Individual	4–79	3–72
1042	Sams, James	Individual	4–79	3–72
1043	Kelly, Alice	Individual	4–79	3–72
1044	Sefton, John	Individual	4–79	3–72
1045	Weimer, Margaret	Individual	4–79	3–72
1046	Hetherington, Lance	Individual	4–79	3–72
1047	Malmuth, Sonja	Individual	4–79	3–72
1048	Melton, Michelle	Individual	4–79	3–72
1049	Scott, John	Individual	4–79	3–72
1050	Evans, Michael W.	Individual	4–79	3–72
1051	Rytina, Jenna	Individual	4–79	3–72
1052	La Frinere, Rochelle	Individual	4–79	3–72
1053	Kline, Laree	Individual	4–79	3–72
1054	Trimble, Robert C.	Individual	4–79	3–72
1055	Kaku, Agness	Individual	4–79	3–72
1056	Evans, Dinda	Individual	4–79	3–72
1057	Santana, Kathryn	Individual	4–79	3–72
1058	Kirby, Rya	Individual	4–79	3–72
1059	Delker, Jennifer	Individual	4–79	3–72
1060	Hung, Eumy	Individual	4–79	3–72
1061	Crews, Amy	Individual	4–79	3–72
1062	Sherwood, Maris	Individual	4–79	3–72
1063	Bookidis, Paul	Individual	4–79	3–72
1064	Erickson, Karen	Individual	4–79	3–72
1065	Foss, Janice	Individual	4–79	3–72
1066	Raghav, Shyla	Individual	4–79	3–72
1067	Winterer, Ted	Individual	4–79	3–72
1068	Whitnah, Claudia	Individual	4–79	3–72
1069	Gagomiros, Keith	Individual	4–79	3–72
1070	Rudolph, Ana	Individual	4–79	3–72
1071	Oravec, Lora J.	Individual	4–79	3–72
1072	Tabib, Michael	Individual	4–79	3–72
1073	Ives, Brandon	Individual	4–79	3–72
1074	Zahller, Guy	Individual	4–79	3–72
1075	Mungle, Terri	Individual	4–79	3–72
1076	Pan, Pinky Jain	Individual	4–79	3–72
1077	Bolt, Patricia	Individual	4–79	3–72
1078	Viglia, Peter	Individual	4–79	3–72
1079	Weber, Majill-Lee	Individual	4–79	3–72
1080	Parisi-Smith, Nicole	Individual	4–79	3–72
1081	Lien, David	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

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1082	Harrington, Chris	Individual	4–79	3–72
1083	Maddox, Melvyn	Individual	4–79	3–72
1084	Kirschling, Karen	Individual	4–79	3–72
1085	Barker, Helen	Individual	4–79	3–72
1086	Seymour, Laurie S.	Individual	4–79	3–72
1087	Campbell, Amy	Individual	4–79	3–72
1088	Mclean, Sarah	Individual	4–79	3–72
1089	Folsom, Susan	Individual	4–79	3–72
1090	Starke-Livermore, Shanna	Individual	4–79	3–72
1091	Osman, Kristen	Individual	4–79	3–72
1092	Ganz, Shiela	Individual	4–79	3–72
1093	DaSilva, Ena	Individual	4–79	3–72
1094	Stimmel, Rodney	Individual	4–79	3–72
1095	Jones, Allan B.	Individual	4–79	3–72
1096	Doob, Jennifer	Individual	4–79	3–72
1097	Hudgins, William G.	Individual	4–79	3–72
1098	Booth, Howard	Individual	4–79	3–72
1099	Rubens, Mari	Individual	4–79	3–72
1100	Pennington, Heather	Individual	4–79	3–72
1101	Urani, Thomas B.	Individual	4–79	3–72
1102	DuPont, Collette	Individual	4–79	3–72
1103	Wagner, G. Blu	Individual	4–79	3–72
1104	Seidler, Chuck	Individual	4–79	3–72
1105	Zarchin, Paul	Individual	4–79	3–72
1106	Navarrete, Paloma	Individual	4–79	3–72
1107	de Greiff, Juan	Individual	4–79	3–72
1108	Tutihasi, R-Laurraine	Individual	4–79	3–72
1109	Bremner, Marlene	Individual	4–79	3–72
1110	Hanley, Jim	Individual	4–79	3–72
1111	Jenvey, Lottie	Individual	4–79	3–72
1112	Riley, Deborah Cloven	Individual	4–79	3–72
1113	Williams, Seanna	Individual	4–79	3–72
1114	Wolters, Mel	Individual	4–79	3–72
1115	Carlson, Cathleen A.	Individual	4–79	3–72
1116	Stone, Jim	Individual	4–79	3–72
1117	Woodcock, Angela	Individual	4–79	3–72
1118	Woodcock, Angela	Deleted-Duplicate of Document #1117		
1119	Wolf, Rachel	Individual	4–79	3–72
1120	Tuckman, Roy	Individual	4–79	3–72
1121	Reimers, Andy	Individual	4–79	3–72
1122	Scherek, Roxane	Individual	4–79	3–72
1123	Fischer, John	Individual	4–79	3–72
1124	Spotts, Richard	Individual	4–79	3–72
1125	Irwin, Craig	Individual	4–79	3–72
1126	Khalsa, Mha Atma	Individual	4–79	3–72
1127	Roberson, Keegan	Individual	4–79	3–72
1128	Macdonald, BC	Individual	4–79	3–72
1129	Bunch, Christopher	Individual	4–79	3–72
1130	Moore, Jackie	Individual	4–79	3–72
1131	Crowell, Sam	Individual	4–79	3–72
1132	Blalack, Russell	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1133	Riddle, Donna	Individual	4–79	3–72
1134	Thomas, Kim	Individual	4–79	3–72
1135	Brownrigg, Sarah	Individual	4–79	3–72
1136	Johnston, Bob	Individual	4–79	3–72
1137	Manning, Alexis	Individual	4–79	3–72
1138	Thomas, Lori	Individual	4–79	3–72
1139	Key, Lynda	Individual	4–79	3–72
1140	Kite, Karen	Individual	4–79	3–72
1141	Barnes, Joel	Individual	4–79	3–72
1142	Papi, Maria	Individual	4–79	3–72
1143	March, Marie	Individual	4–79	3–72
1144	Clark, Brad	Individual	4–79	3–72
1145	Spitz, Marlene T.	Individual	4–79	3–72
1146	Garland, Wayne	Individual	4–79	3–72
1147	Price, Hedy	Individual	4–79	3–72
1148	Havens, Craig	Individual	4–79	3–72
1149	York, Carole	Individual	4–79	3–72
1150	Jones, Penni	Individual	4–79	3–72
1151	Romero, Monika	Individual	4–79	3–72
1152	Davidson, Jon	Individual	4–79	3–72
1153	Fayman, Bruce	Individual	4–79	3–72
1154	Huser, Verne	Individual	4–79	3–72
1155	Keefer, Nina	Individual	4–79	3–72
1156	Newcomer, David	Individual	4–79	3–72
1157	Dupre, Christine	Individual	4–79	3–72
1158	Rodda, Beth	Individual	4–79	3–72
1159	Bajwa, Raghbir	Individual	4–79	3–72
1160	Chase, Lisa	Individual	4–79	3–72
1161	Jempel, Marilyn	Individual	4–79	3–72
1162	Wayne, Jerry	Individual	4–79	3–72
1163	Breiding, Joan	Individual	4–79	3–72
1164	Khan, Nezer	Individual	4–79	3–72
1165	Markus, Mary	Individual	4–79	3–72
1166	Samenfeld, Herbert	Individual	4–79	3–72
1167	McMillan, Erik	Individual	4–79	3–72
1168	Langdon, Christine	Individual	4–71	3–71
1169	Brown, Myrna	Individual	4–79	3–72
1170	Wong, Teresa	Individual	4–79	3–72
1171	Cobb, Dean	Individual	4–79	3–72
1172	Randall, Holly	Individual	4–79	3–72
1173	Verry, James	Individual	4–79	3–72
1174	Vangi-Stern, Eva	Individual	4–79	3–72
1175	Rosher, Ellen	Individual	4–79	3–72
1176	Soraghan, Conor	Individual	4–79	3–72
1177	Dudrick, Roseann	Individual	4–79	3–72
1178	Henderson, Sharrie	Individual	4–79	3–72
1179	Berman, Irwin and Lila	Individual	4–79	3–72
1180	Berman, Lila and Irv	Individual	4–79	3–72
1181	Spencer, Gayle	Individual	4–79	3–72
1182	Declario, A.	Individual	4–79	3–72
1183	Adams, Lani J.	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1184	Monterroso, Sara	Individual	4–79	3–72
1185	Russell, Dorothy	Individual	4–79	3–72
1186	Carren, Claire	Individual	4–79	3–72
1187	Sheets, Kevin	Individual	4–79	3–72
1188	Kearns, D	Individual	4–79	3–72
1189	Schuler, Urs	Individual	4–79	3–72
1190	Landin, Mireya	Individual	4–79	3–72
1191	Carr-Fingerle, Joelyn	Individual	4–79	3–72
1192	Diehl, Marina	Individual	4–79	3–72
1193	McClintock, Catherine	Individual	4–79	3–72
1194	Parker, Vaughan	Individual	4–79	3–72
1195	Seltzer, Robert	Individual	4–79	3–72
1196	Dennis, Larry	Individual	4–79	3–72
1197	Rousselot, Patrick	Individual	4–79	3–72
1198	Kleinert, Julie	Individual	4–79	3–72
1199	Embrey, Stephanie	Individual	4–79	3–72
1200	Fein, M D	Individual	4–79	3–72
1201	Nabas, Jeff	Individual	4–79	3–72
1202	Weisz, Russel	Individual	4–79	3–72
1203	Morgan, Jacob	Individual	4–79	3–72
1204	Saltzman, Barry	Individual	4–79	3–72
1205	Richardson, Matthew	Individual	4–79	3–72
1206	Weymouth, Douglass	Individual	4–79	3–72
1207	Newton, Peter	Individual	4–79	3–72
1208	Triplett, Tia	Individual	4–79	3–72
1209	Sankey, Diana	Individual	4–79	3–72
1210	Peirce, Susan	Individual	4–79	3–72
1211	Grossman, Paul B	Individual	4–79	3–72
1212	Karsh, Lynn	Individual	4–79	3–72
1213	Mierau, Gary	Individual	4–79	3–72
1214	Basnar, Lee	Individual	4–79	3–72
1215	Burian-Mohr, Eleanor	Individual	4–79	3–72
1216	Patrickson, Shela	Individual	4–79	3–72
1217	Bauer, Gwynne	Individual	4–79	3–72
1218	Hicks, David	Individual	4–79	3–72
1219	Suhy, Jim	Individual	4–79	3–72
1220	Aguado, Barbara	Individual	4–79	3–72
1221	Huupponen, Tristen	Individual	4–79	3–72
1222	Ewing, Tracy	Individual	4–79	3–72
1223	Roden, Tessa	Individual	4–79	3–72
1224	Cuddeback, Ken	Individual	4–79	3–72
1225	Drake, Mercy	Individual	4–79	3–72
1226	Noah, Ian	Individual	4–79	3–72
1227	Hamel, Bob	Individual	4–79	3–72
1228	Fielder, Lynn	Individual	4–79	3–72
1229	Dunn, Eddy	Individual	4–79	3–72
1230	Carmichael, Jan	Individual	4–79	3–72
1231	Trujillo, Rebecca	Individual	4–79	3–72
1232	Anderson, Corina	Individual	4–79	3–72
1233	Brook, Dan	Dept of Soc	4–79	3–72
1234	Fahlberg, Maureen	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1235	Riley, Callie	Individual	4–79	3–72
1236	Clark, Dustin	Individual	4–79	3–72
1237	Cupp, Jonathan	Individual	4–79	3–72
1238	Moore, Judy	Individual	4–79	3–72
1239	Hayes, Sara	Individual	4–79	3–72
1240	Evans, Lauren	Individual	4–79	3–72
1241	Riley, Raymond	Individual	4–79	3–72
1242	Miller, Lisa	Individual	4–79	3–72
1243	Blackwell, Randi	Individual	4–79	3–72
1244	Ellis, David	Individual	4–79	3–72
1245	Woo, Howard	Individual	4–79	3–72
1246	Wahose, Mare	Individual	4–79	3–72
1247	Samuels, Harold A	Individual	4–79	3–72
1248	Marsten, Catherine	Individual	4–79	3–72
1249	Collins, Brian	Individual	4–79	3–72
1250	Smeal, Mindy A	Individual	4–79	3–72
1251	Kaczmarek, Periel	Individual	4–79	3–72
1252	DeBo/Stauffer, Melanie	Individual	4–79	3–72
1253	Marugg, Cynthia	Individual	4–79	3–72
1254	Peer, Kevin	Individual	4–79	3–72
1255	Clark, Dustin	Deleted-Duplicate of Document #1236		
1256	Shelton, Brand	Individual	4–79	3–72
1257	Overstreet, Jan	Individual	4–79	3–72
1258	Wallner, Mary Ann	Individual	4–79	3–72
1259	Mason, Barbara	Individual	4–79	3–72
1260	Stutz, Kathleen G	Individual	4–79	3–72
1261	Hudson, Joan	Individual	4–79	3–72
1262	Nemeth, Teresa	Individual	4–79	3–72
1263	Gauthier-Campbell, Catherine	Individual	4–79	3–72
1264	Heintzelman, Chris	Individual	4–79	3–72
1265	Wohl, Ellen	Department of Earth Resources Colorado State University	4–79	3–72
1266	King, Jayne L	Individual	4–79	3–72
1267	Drake, Cindi	Individual	4–79	3–72
1268	Berglas, Silvia	Individual	4–79	3–72
1269	Bryant, Richard	Individual	4–79	3–72
1270	Kluscor, Carmen	Individual	4–79	3–72
1271	Dicamillo, Jessica	Individual	4–79	3–72
1272	M., Lexi	Individual	4–79	3–72
1273	Kollmeyer, Charlotte	Individual	4–79	3–72
1274	Warne, Pete	Individual	4–79	3–72
1275	O'Donnell, Kelly	Individual	4–79	3–72
1276	Valenzuela, Andrea	Individual	4–79	3–72
1277	Harper, Laura	Individual	4–79	3–72
1278	Pierce, Deborah	Individual	4–79	3–72
1279	Young, Mary	Individual	4–79	3–72
1280	Dzienius, Susan	Individual	4–79	3–72
1281	Williams, Janet	Individual	4–79	3–72
1282	Lauder, Leona L	Individual	4–79	3–72
1283	Whitcomb, Matthew S	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1284	Lyon, Jay	Individual	4–79	3–72
1285	Wilber, Douglas	Individual	4–79	3–72
1286	Mallard, Angela	Individual	4–79	3–72
1287	Miller, Nancy	Individual	4–79	3–72
1288	Bernacchi, Carol	Individual	4–79	3–72
1289	Kay, Joni	Individual	4–79	3–72
1290	Zoline, Abigail	Individual	4–79	3–72
1291	Latham, Zach	Individual	4–79	3–72
1292	Whitcomb, Paulette	Individual	4–79	3–72
1293	Heinold, Christian	Individual	4–79	3–72
1294	Reilly, Robert	Individual	4–79	3–72
1295	Lee, Debra	Individual	4–79	3–72
1296	Burger, Bitsa	Individual	4–79	3–72
1297	Goitein, Ernest	Individual	4–79	3–72
1298	Brandon, Victoria	Individual	4–79	3–72
1299	Gilland, James	Individual	4–79	3–72
1300	Plotkin, Christine	Individual	4–79	3–72
1301	Roach, Kenneth	Individual	4–79	3–72
1302	Hoxeng, Jessica	Individual	4–79	3–72
1303	Landowne, Deborah	Individual	4–79	3–72
1304	Houghton, Jack	Individual	4–79	3–72
1305	Pena, Debbie	Individual	4–79	3–72
1306	Segall-Anable, Linda	Individual	4–79	3–72
1307	Brown, Brenda	Individual	4–79	3–72
1308	Laplaca, Nancy	Individual	4–79	3–72
1309	Webber, Rita	Individual	4–79	3–72
1310	Buss, Jennie	Individual	4–79	3–72
1311	Fritzler, Cyndi	Individual	4–79	3–72
1312	Hahler, Pamela	Individual	4–79	3–72
1313	Young, Jennifer	Individual	4–79	3–72
1314	Hotchkiss, John	Individual	4–79	3–72
1315	Esmond, Scott	Individual	4–79	3–72
1316	Pollock, Jeri	Individual	4–79	3–72
1317	Johnson, Kim	Individual	4–79	3–72
1318	Sanford, Julie	Individual	4–79	3–72
1319	Benson, Richard	Individual	4–79	3–72
1320	Kemmerer, David	Individual	4–79	3–72
1321	Johnson, Kim	Deleted-Duplicate of Document #1317		
1322	Vertrees, Gerald	Individual	4–79	3–72
1323	Signorile, Karen	Individual	4–79	3–72
1324	Taylor, Steven	Individual	4–79	3–72
1325	Conroy, Thomas	Individual	4–79	3–72
1326	Pierpont, Leslie	Individual	4–79	3–72
1327	Neuhauser, Alice	Individual	4–79	3–72
1328	Tyler, Steve	Individual	4–79	3–72
1329	Souza, Michael	Individual	4–79	3–72
1330	Michals, Jessica	Individual	4–79	3–72
1331	Donatoni, Matthew	Individual	4–79	3–72
1332	Burgett, Jessica	Individual	4–79	3–72
1333	Pollard, Jason	Individual	4–79	3–72
1334	Thomas, Kevin	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1335	Kemmerer, Carol	Individual	4–79	3–72
1336	Gerety, Sheryl Lynn	Individual	4–79	3–72
1337	Firshein, David	Individual	4–79	3–72
1338	Galloway, Jeanette	Individual	4–79	3–72
1339	Specht, Chris	Individual	4–79	3–72
1340	Evans, Nancy	Individual	4–79	3–72
1341	Cahill, Tom	Individual	4–79	3–72
1342	Schilder, Mary	Individual	4–79	3–72
1343	Womble, Jeffrey	Individual	4–79	3–72
1344	Meierdierck, Jay	Individual	4–79	3–72
1345	Oden, Beth	Individual	4–79	3–72
1346	Schaffer, Gabe	Individual	4–79	3–72
1347	Reynolds, Debra	Individual	4–79	3–72
1348	Cerello, Robert M	Individual	4–79	3–72
1349	Piper, Gayle	Individual	4–79	3–72
1350	Lyon, Kelly	Individual	4–79	3–72
1351	Thing, Susan	Individual	4–79	3–72
1352	Cirina, Cathy	Individual	4–79	3–72
1353	Arikat, Amin	Individual	4–79	3–72
1354	Barile, Dominic	Individual	4–79	3–72
1355	Turek, Gabriella	Individual	4–79	3–72
1356	Hempel, Marilyn	Individual	4–79	3–72
1357	Marsh, Marie	Individual	4–79	3–72
1358	Musco, Danielle	Point Loma Nazarene University	4–71	3–71
1359	Ferullo, Michael	Deleted-Not an EIS comment		
1360	Saith, Arun	Individual	4–71	3–71
1361	Le, Timmy	Individual	4–71	3–71
1362	Gonzalez, Michael BA, BS, MBA, JD	UC San Diego	4–71	3–71
1363	Nyman, Suiko Dam	Individual	4–71	3–71
1364	Kambak, Jackie	Individual	4–78	3–72
1365	Luckyman	Individual	4–71	3–71
1366	Isensee, Chris	Individual	4–79	3–72
1367	Thompson, Mr.	Deleted-Duplicate of Document #421		
1368	Davenport, James H.	Colorado River Commission of Nevada	4–736	3–468
1369	Hunter, Duncan	Deleted-Not an EIS comment		
1370	Bostic, Wayne	Individual	4–71	3–71
1371	Mishiwiec, Sr., David F.	Individual	4–71	3–71
1372	Alexander, Bob	Individual	4–71	3–71
1373	Colosimo, Joe	Individual	4–78	3–72
1374	Hartung, Doug	Individual	4–71	3–71
1375	Price, Roberta	Individual	4–78	3–72
1376	Farhana	Individual	4–71	3–71
1377	Leichtling, Suzanne	Individual	4–81	3–73
1378	Hughes, Shannon	Individual	4–81	3–73
1379	Breiding, Joan	Individual	4–81	3–73
1380	Burger, Bitsa	Individual	4–81	3–73
1381	Bernstein, Bob	Individual	4–81	3–73
1382	Baughman, Jamie	Individual	4–81	3–73
1383	Gustus, Robin	Individual	4–81	3–73

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1384	Burton, G.	Individual	4–81	3–73
1385	Fedorchuk, Justina	Individual	4–81	3–73
1386	Burbridge, Scott	Individual	4–81	3–73
1387	Bernstein, Linda	Individual	4–81	3–73
1388	Rogers, Lila	Individual	4–81	3–73
1389	Copeland, Lisa	Individual	4–81	3–73
1390	Sobanski, Sandra	Individual	4–81	3–73
1391	Howell, Jr., Ruben J.	Individual	4–81	3–73
1392	Zlevor, JoAnne	Individual	4–81	3–73
1393	Nadelman, Fred	Individual	4–81	3–73
1394	Chase, Maureen	Individual	4–81	3–73
1395	Wells, Kimball	Individual	4–81	3–73
1396	Feinstein, Dianne	U.S. Senate	4–739	3–471
1397	Rivera, Gloria A.	Imperial Irrigation District	4–71	3–71
1398	Smith, Darrell H.	Salt Lake County Council of Governments	4–741	3–473
1399	Morgan, Edward C.	Town of Carefree	4–71	3–71
1400	Zimmerman, Gerald R.	Colorado River Board of California	4–742	3–478
1401	Smith, Edward D. "Tito"	Chemehuevi Indian Tribe	4–71	3–71
1402	McDowell, Nora	Fort Mojave Indian Tribe	4–71	3–71
1403	Hedden, Bill	Deleted-Not an EIS comment		
1404	Fields, Sarah M.	Individual	4–746	3–482
1405	Brian, Danielle	Project on Government Oversight	4–764	3–492
1406	Dobyns, Mary	Individual	4–71	3–71
1407	Goodlove, Glenn	Individual	4–71	3–71
1408	Schulze, Jane Carney	Individual	4–71	3–71
1409	Pinzon, Genny	Individual	4–78	3–72
1410	Hobza, Tony	Individual	4–71	3–71
1411	Hurd, Thomas	Individual	4–78	3–72
1412	Holmes, Jennifer	Individual	4–71	3–71
1413	Kantola, Angela T.	Individual	4–71	3–71
1414	Elliott, Rob	Arizona Raft Adventures, Inc.	4–78	3–72
1415	Fred	Individual	4–71	3–71
1416	Henry, Will	Point Loma Nazarene University	4–71	3–71
1417	Pamper, John	Individual	4–78	3–72
1418	Castlevega	Individual	4–71	3–71
1419	Diener, Evelyn	Individual	4–71	3–71
1420	Games, John	Individual	4–78	3–72
1421	Cowie, Laura	Individual	4–71	3–71
1422	Paul, Courtney	Individual	4–71	3–71
1423	Schroeder, Sandra	Individual	4–71	3–71
1424	Paul, Nichole	Individual	4–71	3–71
1425	Hobbs, Terri	Individual	4–71	3–71
1426	O'Connell, Colleen	Individual	4–71	3–71
1427	Wong, Lauren	Individual	4–71	3–71
1428	Bray, Emily	Individual	4–71	3–71
1429	Sussman, Deb	Individual	4–71	3–71
1430	Darke, John	Individual	4–766	3–494
1431	Landrum, Sheryl	Individual	4–71	3–71

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1432	Gosnell, James	Individual	4–767	3–495
1433	Inaba, Nancy	Individual	4–71	3–71
1434	Bailey, Janeen and Wyane	Individual	4–71	3–71
1435	Ridder, Ross	Direct Marketing Resources, Inc.	4–71	3–71
1436	Baldwin, Rob	Individual	4–78	3–72
1437	Repp, David	Individual	4–71	3–71
1438	Rajgopal, Rohini	Individual	4–71	3–71
1439	Waclawik, Matthew	Individual	4–71	3–71
1440	Moore, Marsha	Individual	4–71	3–71
1441	Pembersee, Gary	Individual	4–71	3–71
1442	Juskalian, Lee	Individual	4–71	3–71
1443	Koda, Dennis	Individual	4–71	3–71
1444	Keck, Marcella L.	Individual	4–71	3–71
1445	Roache, Kevin	Individual	4–71	3–71
1446	Evans, Laura	Individual	4–71	3–71
1447	Call, Russ	Individual	4–71	3–71
1448	C., J.A.	Individual	4–71	3–71
1449	Smolin, Ron	Individual	4–71	3–71
1450	Joyal, Lou Ann	Individual	4–79	3–72
1451	Voss, Barbara	Individual	4–79	3–72
1452	Waring, Dawn	Individual	4–79	3–72
1453	Ransom, G. Harry	Individual	4–79	3–72
1454	Graham, Ariel	Individual	4–79	3–72
1455	Baker, Tanya	Individual	4–79	3–72
1456	Hanks, Kim	Individual	4–79	3–72
1457	Sanders, Gary	Individual	4–79	3–72
1458	Schlomberg, Kurt	Individual	4–79	3–72
1459	Pasichnyk, Richard	Individual	4–79	3–72
1460	Faulk, Janeen	Individual	4–79	3–72
1461	Denny, Rachael	Individual	4–79	3–72
1462	Deutsch, Eileen	Individual	4–79	3–72
1463	Groome, Malcolm	Individual	4–79	3–72
1464	Garvin, Michael	Individual	4–79	3–72
1465	Dye, Claire	Individual	4–79	3–72
1466	Norton, Asiel	Individual	4–79	3–72
1467	Benson, Sheila	Individual	4–79	3–72
1468	Kitchin, Millie	Individual	4–79	3–72
1469	Estes, Douglas	Individual	4–79	3–72
1470	Landis-Hanna, Amanda	Individual	4–79	3–72
1471	Shockley, Mark	Deleted-Duplicate of Document #949		
1472	Quilici, Jill	Individual	4–79	3–72
1473	Taylor, Linda Lee	Individual	4–79	3–72
1474	Wiget Ii, Francis X.	Individual	4–79	3–72
1475	Kjonaas, Raechel	Individual	4–79	3–72
1476	Greiner, Tony	Individual	4–79	3–72
1477	Brown, Keri	Individual	4–79	3–72
1478	Zamora, Delilah	Individual	4–79	3–72
1479	Salgado, Diego	Individual	4–79	3–72
1480	Fuller, Michelle	Individual	4–79	3–72
1481	Ryan, Bela	Individual	4–79	3–72

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1482	Tamminen, Lenn	Individual	4–79	3–72
1483	Strawn, Lori	Individual	4–79	3–72
1484	Zeldas, Sandy	Individual	4–79	3–72
1485	Leenerts, Kathleen	Individual	4–79	3–72
1486	Parkinson, Jean	Individual	4–79	3–72
1487	Enders, Todd	Individual	4–79	3–72
1488	Greene, Jack	Individual	4–79	3–72
1489	Bergman, Barbie	Individual	4–79	3–72
1490	Heilpern, Slim	Individual	4–79	3–72
1491	Soderlind, Johan	Individual	4–79	3–72
1492	Hollister, Richard	Individual	4–79	3–72
1493	White, Sharlene	Individual	4–79	3–72
1494	Peeplez, Kelle	Individual	4–79	3–72
1495	Bogear, Lee A.	Individual	4–79	3–72
1496	Kirschbaum, Norton and Sara	Individual	4–79	3–72
1497	Bushnell, Martha	Individual	4–79	3–72
1498	Rashall, Rosa	Individual	4–79	3–72
1499	Williams, Jane	California Communities Against Toxics	4–71	3–71
1500	Harper, David	Mohave Cultural Preservation Program	4–71	3–71
1501	Eddy, Jr., Daniel	Colorado River Indian Tribes	4–769	3–496
1502	Mitchell, William and Leslie	Individual	4–71	3–71
1503	Juan-Sanders, Vivian	Inter Tribal Council of Arizona	4–770	3–498
1504	Wolfe, John	Individual	4–71	3–71
1505	Beeman, Daniel	Individual	4–78	3–72
1506	Costa, Eileen	Individual	4–71	3–71
1507	Landis-Hanna, Amanda	Individual	4–81	3–73
1508	Harlib, Amy	Individual	4–81	3–73
1509	Townshend, Arianne	Individual	4–81	3–73
1510	Beckner, Azel	Individual	4–81	3–73
1511	Jenkins, Basil	Individual	4–81	3–73
1512	MacKer, Bonnie	Individual	4–81	3–73
1513	Stanersen, Brad	Individual	4–81	3–73
1514	Rex, Carrie	Individual	4–81	3–73
1515	Muhs, Casey	Individual	4–81	3–73
1516	Sampson, Christie	Individual	4–81	3–73
1517	Maron, Country	Individual	4–81	3–73
1518	Daughterty, Crystal	Individual	4–81	3–73
1519	Bonk, Dale	Individual	4–81	3–73
1520	Lord, Danyel	Individual	4–81	3–73
1521	Dunkleberger, David	Individual	4–81	3–73
1522	Szymanski, Debbie	Individual	4–81	3–73
1523	Reynolds, Debra	Individual	4–81	3–73
1524	Costa, Demelza	Individual	4–81	3–73
1525	Kroth, Denise	Individual	4–81	3–73
1526	Radcliffe, Donald	Individual	4–81	3–73
1527	Dunn, Eddy	Individual	4–81	3–73
1528	Cubero, Edward	Individual	4–81	3–73
1529	Royer, Erica	Individual	4–81	3–73
1530	De La Ossa, Farid	Individual	4–81	3–73
1531	Sanders, Gary	Individual	4–81	3–73

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1532	Sullivan, Gayle	Individual	4–81	3–73
1533	Nash, Gloria	Individual	4–81	3–73
1534	Rhodes, Harriet	Individual	4–81	3–73
1535	Steffens, Howard	Individual	4–81	3–73
1536	Jorgensen, James	Individual	4–81	3–73
1537	Blackiston, Janeanne	Individual	4–81	3–73
1538	Foss, Janice	Individual	4–81	3–73
1539	Walden, Jeanette	Individual	4–81	3–73
1540	Andrews, Jenna	Individual	4–81	3–73
1541	Derzon, Jim	Individual	4–81	3–73
1542	Miller, John Davidson	Individual	4–81	3–73
1543	Mock, John	Individual	4–81	3–73
1544	Manto, Jonathan	Individual	4–81	3–73
1545	Edwards, Judi	Individual	4–81	3–73
1546	Vincent, Judy	Individual	4–81	3–73
1547	Wixon, Karen	Individual	4–81	3–73
1548	Ravenstein, Kate	Individual	4–81	3–73
1549	Rode, Katharine	Individual	4–81	3–73
1550	Gardner, Katherine	Individual	4–81	3–73
1551	Steele, Kathleen	Individual	4–81	3–73
1552	Herren, Ken	Individual	4–81	3–73
1553	Powanda, Kim	Individual	4–81	3–73
1554	Hanson, Kristin	Individual	4–81	3–73
1555	Aviles, Lauren & Olivia	Individual	4–81	3–73
1556	Raddish, Leah	Individual	4–81	3–73
1557	Marshall, Lisa	Individual	4–81	3–73
1558	Jenvey, Lottie	Individual	4–81	3–73
1559	Blue, Malcolm	Individual	4–81	3–73
1560	Layden, Marcella	Individual	4–81	3–73
1561	Babcock, Maria	Individual	4–81	3–73
1562	Corriere, Marianne	Individual	4–81	3–73
1563	Feldman, Mark	Individual	4–81	3–73
1564	Maddox, Melvyn	Individual	4–81	3–73
1565	Loscaizo-Stumpf, Merry	Individual	4–81	3–73
1566	Chase, Michael	Individual	4–81	3–73
1567	MacDougall, Mike	Individual	4–81	3–73
1568	Allen, Monique	Individual	4–81	3–73
1569	Fanos, Nancy	Individual	4–81	3–73
1570	Spears, Nancy	Individual	4–81	3–73
1571	Oggiono, Nanette	Individual	4–81	3–73
1572	Masek, Norma	Individual	4–81	3–73
1573	Brawn, Pam	Individual	4–81	3–73
1574	Martinsen, Paula	Individual	4–81	3–73
1575	Joannidis, Peter	Individual	4–81	3–73
1576	C'De Baca, Phillip	Individual	4–81	3–73
1577	Pooni, Ranjit	Individual	4–81	3–73
1578	Long, Rebecca	Individual	4–81	3–73
1579	Wilkinson, Richard	Individual	4–81	3–73
1580	Blackiston, Robert	Individual	4–81	3–73
1581	Loucks, Robert	Individual	4–81	3–73
1582	Schultz, Robert	Individual	4–81	3–73

Table 4−1. Index of Responses by Document Number (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1583	Press, Roland	Individual	4–81	3–73
1584	Avila, Ron	Individual	4–81	3–73
1585	Weisz, Russell	Individual	4–81	3–73
1586	Schwartz, Sally	Individual	4–81	3–73
1587	Monterroso, Sara	Individual	4–81	3–73
1588	Wozniak, Shawn	Individual	4–81	3–73
1589	Feyne, Stephanie	Individual	4–81	3–73
1590	Glazer, Steve	Individual	4–81	3–73
1591	McClain, Trent	Individual	4–81	3–73
1592	Boyd, Veronika	Individual	4–81	3–73
1593	Whitacre, Vickie	Individual	4–81	3–73
1594	Bonsignore, Victoria	Individual	4–81	3–73
1595	Hatch, Orrin	Deleted−Duplicate of Document #119		
1596	Bennett, Robert F.	Deleted−Duplicate of Document #119		
1597	Cannon, Chris	Deleted−Duplicate of Document #119		
1598	Matheson, Jim	Deleted−Duplicate of Document #119		
1599	Bishop, Rob	Deleted−Duplicate of Document #119		
1600	Rich, Diane	Individual	4–71	3–71
1601	Williams, David	Deleted-Not an EIS comment		

[a]Signatories: Orrin G. Hatch, U.S. Senator
Robert F. Bennett, U.S. Senator
Chris Cannon, U.S. Representative
Jim Matheson, U.S. Representative
Rob Bishop, U.S. Representative

[b]Signatories: Jim Matheson, U.S. Representative
Chris Cannon, U.S. Representative
Grace Napolitano, U.S. Representative
David Dreier, U.S. Representative
Lucille Roybal-Allard, U.S. Representative
Bob Filner, U.S. Representative
Shelley Berkley, U.S. Representative
J.D. Hayworth, U.S. Representative
Dennis Cardoza, U.S. Representative
Susan Davis, U.S. Representative
Mark Udall, U.S. Representative
Henry Waxman, U.S. Representative
Juanita Millender-McDonald, U.S. Representative
Rick Renzi, U.S. Representative
George Miller, U.S. Representative
Rob Bishop, U.S. Representative
Joe Baca, U.S. Representative
Linda Sanchez, U.S. Representative
Raul Grijalva, U.S. Representative
Jeff Flake, U.S. Representative
Hilda Solis, U.S. Representative

Table 4–2. Index of Responses by Last Name

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
253	A Concerned Reader	Individual	4–71	3–71
161	Aarestad, Kevin	Individual	4–71	3–71
247	Abbott, Susan	Individual	4–71	3–71
202	Acerro, Theresa	Individual	4–71	3–71
1025	Ackerman, Beverly	Individual	4–79	3–72
842	Ackerman, Frank A.	Individual	4–79	3–72
1183	Adams, Lani J.	Individual	4–79	3–72
470	Adams, Muriel	Individual	4–71	3–71
866	Adkins, Elizabeth	Individual	4–79	3–72
1220	Aguado, Barbara	Individual	4–79	3–72
825	Aguilar, Felix	Individual	4–79	3–72
924	Aguirre, Patricia	Individual	4–79	3–72
212	Alaris	Individual	4–71	3–71
810	Albright, Evan	Individual	4–79	3–72
1372	Alexander, Bob	Individual	4–71	3–71
246	Alexander, James P. and Pamela G.	Individual	4–71	3–71
650	Allen, Aimee	Individual	4–71	3–71
40	Allen, Duncan	Individual	4–78	3–72
1568	Allen, Monique	Individual	4–81	3–73
709	Alsup, Adel	Individual	4–71	3–71
406	Alton, Diane	Individual	4–71	3–71
438	Ambrose, Laura, Jeff, Brett, and Cole	Individual	4–71	3–71
296	Ampe, Tim	Individual	4–71	3–71
961	Anderson, Clifford	Individual	4–79	3–72
1232	Anderson, Corina	Individual	4–79	3–72
778	Anderson, Ellen	Individual	4–79	3–72
320	Anderson, Jane	Individual	4–71	3–71
1036	Anderson, Jeffry	Individual	4–79	3–72
858	Anderson, Russ	Individual	4–79	3–72
611	Anderson, Wayne	Individual	4–71	3–71
1540	Andrews, Jenna	Individual	4–81	3–73
407	Andykaz	Individual	4–71	3–71
912	Anelli, Darla	Individual	4–79	3–72
71	Angel, Bradley	Green Action for Health and Environmental Justice	4–184	3–125
99	Angel, Bradley	Green Action for Health and Environmental Justice	4–247	3–153
534	Angel, Bradley	Greenaction for Health & Environmental Justice	4–71	3–71
547	Angel, Bradley	Green Action	4–400	3–260
274	Angelico, Dean and Phyllis	Individual	4–71	3–71
310	Anonymous 1	Individual	4–78	3–72
478	Anonymous 1 Feb 16	Individual	4–71	3–71
316	Anonymous 2	Individual	4–71	3–71
339	Anonymous 3	Individual	4–71	3–71
342	Anonymous 4	Individual	4–71	3–71
708	Anonymous 5	Individual	4–78	3–72
713	Anonymous 6	Individual	4–71	3–71
715	Anonymous 7	Individual	4–71	3–71
716	Anonymous 8	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
717	Anonymous 9	Individual	4–71	3–71
477	Anonymous Feb 16	Individual	4–71	3–71
447	Anonymous San Diego	Individual	4–78	3–72
500	Anthony, Linda R.	Individual	4–71	3–71
848	Apkarian, Jennifer	Individual	4–79	3–72
174	Applen, Kathleen	Individual	4–71	3–71
1353	Arikat, Amin	Individual	4–79	3–72
764	Armour, Peggy	Individual	4–79	3–72
565	Arnold, Chris	Individual	4–71	3–71
74	Atcitty, Elaine	White Mesa Ute Indian Tribe	4–195	3–129
640	Atkins, Dr. Sue	Point Loma Nazarene University	4–71	3–71
183	August, Gary	Individual	4–71	3–71
737	Austin, Janina	Individual	4–71	3–71
1584	Avila, Ron	Individual	4–81	3–73
1555	Aviles, Lauren & Olivia	Individual	4–81	3–73
577	Babbitt, James	Individual	4–71	3–71
580	Babcock, Arlinda & Jeffrey	Individual	4–71	3–71
1561	Babcock, Maria	Individual	4–81	3–73
69	Badback, Yolanda	Individual	4–177	3–122
48	Bailey, Carrie	Individual	4–71	3–71
865	Bailey, Ellen	Individual	4–79	3–72
1434	Bailey, Janeen and Wyane	Individual	4–71	3–71
685	Bain, Frank	Individual	4–71	3–71
1159	Bajwa, Raghbir	Individual	4–79	3–72
854	Baker, Connie	Individual	4–79	3–72
43	Baker, Pamela W.	Individual	4–97	3–86
59	Baker, Quentin	Individual	4–71	3–71
1455	Baker, Tanya	Individual	4–79	3–72
1436	Baldwin, Rob	Individual	4–78	3–72
315	Balistrary, Frank	Individual	4–71	3–71
186	Banks, Tanya	Individual	4–71	3–71
400	Bannister, Daryl	Individual	4–71	3–71
974	Banoczy, Jennifer	Individual	4–79	3–72
194	Barad, Dean	Individual	4–71	3–71
331	Barca, Ron	Individual	4–71	3–71
1354	Barile, Dominic	Individual	4–79	3–72
1085	Barker, Helen	Individual	4–79	3–72
625	Barker, James	Individual	4–71	3–71
359	Barker, John H.	Individual	4–71	3–71
746	Barker, M. J.	Individual	4–71	3–71
230	Barnard, Janet A.	Individual	4–71	3–71
790	Barnard, Michele L.	Individual	4–79	3–72
1141	Barnes, Joel	Individual	4–79	3–72
147	Barnett, Tim	Individual	4–71	3–71
424	Barton, John and Mildred	Individual	4–71	3–71
1214	Basnar, Lee	Individual	4–79	3–72
814	Bassett, Anne	Individual	4–79	3–72
145	Bassik, Ken	Individual	4–71	3–71
595	Bates, Hedda	Individual	4–71	3–71
30	Bates, Tony	Individual	4–78	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
771	Bauchau, Clara	Individual	4–79	3–72
773	Bauchau, Enduit	Individual	4–79	3–72
772	Bauchau, Mijanou	Individual	4–79	3–72
1217	Bauer, Gwynne	Individual	4–79	3–72
1382	Baughman, Jamie	Individual	4–81	3–73
570	Bauman, Sarah	Individual	4–71	3–71
548	Bauman, Valeria	Individual	4–71	3–71
73	Beck, Dudley	Individual	4–193	3–128
304	Beck, Mike and Gina	Individual	4–71	3–71
1510	Beckner, Azel	Individual	4–81	3–73
450	Beeman, Daniel	Individual	4–71	3–71
1505	Beeman, Daniel	Individual	4–78	3–72
518	Belcher, Barbara	Century 21 Carole Realty	4–71	3–71
585	Belkin, Alan	Individual	4–71	3–71
840	Bell, Ray	Individual	4–79	3–72
226	Beneventi, Alan	Individual	4–71	3–71
664	Bennett, Dr. Jean	Individual	4–71	3–71
736	Bennett, James	Individual	4–78	3–72
992	Bennett, Jean	Individual	4–79	3–72
11	Bennett, Jean M.	Individual	4–71	3–71
529	Bennett, Larry E.	Individual	4–71	3–71
1596	Bennett, Robert F.	Deleted−Duplicate of Document #119		
60	Benson, Ashley	John Burroughs School	4–71	3–71
1319	Benson, Richard	Individual	4–79	3–72
1467	Benson, Sheila	Individual	4–79	3–72
1268	Berglas, Silvia	Individual	4–79	3–72
1489	Bergman, Barbie	Individual	4–79	3–72
801	Berliner, Diane	Individual	4–79	3–72
1179	Berman, Irwin and Lila	Individual	4–79	3–72
1180	Berman, Lila and Irv	Individual	4–79	3–72
855	Berman, Nancy	Individual	4–79	3–72
1288	Bernacchi, Carol	Individual	4–79	3–72
1381	Bernstein, Bob	Individual	4–81	3–73
1387	Bernstein, Linda	Individual	4–81	3–73
442	Berryhill, Tamarah	Individual	4–71	3–71
966	Bertetta, Thomas	Individual	4–79	3–72
18	Bickel, Bettina	Individual	4–71	3–71
694	Bifulci, Danielle	Individual	4–71	3–71
351	Binyon, Jean	Sierra Club, Utah Chapter	4–338	3–207
402	Binyon, Michael L.	Individual	4–71	3–71
525	Bishop, Louise & Donn	Individual	4–71	3–71
1599	Bishop, Rob	Deleted−Duplicate of Document #119		
39	Black, John K.	Individual	4–71	3–71
374	Black, Steve	Individual	4–78	3–72
1537	Blackiston, Janeanne	Individual	4–81	3–73
1580	Blackiston, Robert	Individual	4–81	3–73
1243	Blackwell, Randi	Individual	4–79	3–72
753	Blair, Patricia	Individual	4–71	3–71
1132	Blalack, Russell	Individual	4–79	3–72
691	Bleakley, Caroline	Deleted-Not an EIS comment		
87	Bliss, Eleanor	Grand Canyon Trust	4–224	3–145

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
579	Bliss, Eleanor	Individual	4–71	3–71
19	Blue, Jenny	Individual	4–71	3–71
1559	Blue, Malcolm	Individual	4–81	3–73
388	Blume, Donald	Individual	4–71	3–71
85	Bodner, David	Individual	4–220	3–143
50	Bodner, David W.	Individual	4–71	3–71
1018	Boer, Evert	Individual	4–79	3–72
1495	Bogear, Lee A.	Individual	4–79	3–72
121	Boling, William C.	Individual	4–71	3–71
267	Boling, William C.	Deleted-Duplicate of Document #121		
1077	Bolt, Patricia	Individual	4–79	3–72
182	Bolton, Barbara	Individual	4–71	3–71
1519	Bonk, Dale	Individual	4–81	3–73
1594	Bonsignore, Victoria	Individual	4–81	3–73
1063	Bookidis, Paul	Individual	4–79	3–72
1098	Booth, Howard	Individual	4–79	3–72
1012	Bordenave, Michael	Individual	4–79	3–72
484	Bose, Norman	Individual	4–71	3–71
1370	Bostic, Wayne	Individual	4–71	3–71
918	Bousseau, M.	Individual	4–79	3–72
399	Bowden, Karen	Individual	4–71	3–71
178	Bowers, Bruce and Ruth	Individual	4–71	3–71
622	Bowles, Philip	Individual	4–71	3–71
615	Bowles, Sharon	Individual	4–71	3–71
920	Bowman, Margaret	Individual	4–79	3–72
905	Bowman, Nan Singh	Individual	4–79	3–72
32	Boyd, Dunston F.	Individual	4–78	3–72
1592	Boyd, Veronika	Individual	4–81	3–73
275	Bracey, Michael	Individual	4–71	3–71
44	Bradford, Cleal	Individual	4–77	3–72
1298	Brandon, Victoria	Individual	4–79	3–72
348	Brant, Richard H.	Individual	4–71	3–71
308	Brasow, Carl	Deleted-Not an EIS comment		
561	Braun, Joseph	Individual	4–71	3–71
1573	Brawn, Pam	Individual	4–81	3–73
1428	Bray, Emily	Individual	4–71	3–71
1163	Breiding, Joan	Individual	4–79	3–72
1379	Breiding, Joan	Individual	4–81	3–73
233	Breisch, Susan	Individual	4–71	3–71
1109	Bremner, Marlene	Individual	4–79	3–72
517	Breneman Jr., Tom	Individual	4–71	3–71
1013	Brennan, Matt	Individual	4–79	3–72
916	Bretz, William	Individual	4–79	3–72
1405	Brian, Danielle	Project on Government Oversight	4–764	3–492
978	Bright, Jeff	Individual	4–79	3–72
507	Brinn, Charlene	Individual	4–71	3–71
935	Brittenbach, Dennis	Individual	4–79	3–72
1233	Brook, Dan	Dept of Soc	4–79	3–72
995	Brost, Hety	Individual	4–79	3–72
115	Broughton, B.A.	Individual	4–78	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1307	Brown, Brenda	Individual	4–79	3–72
562	Brown, Darcey	Individual	4–71	3–71
550	Brown, Frederick	Individual	4–71	3–71
141	Brown, Joel	Individual	4–71	3–71
1477	Brown, Keri	Individual	4–79	3–72
997	Brown, Kimberley	Individual	4–79	3–72
256	Brown, Lynn	Individual	4–71	3–71
1169	Brown, Myrna	Individual	4–79	3–72
229	Brown, Phyllis	Individual	4–71	3–71
915	Brown, Ronald	Individual	4–79	3–72
473	Brown, Virginia	Individual	4–71	3–71
554	Browne, Robert	Individual	4–71	3–71
1135	Brownrigg, Sarah	Individual	4–79	3–72
475	Bruckell, Cindy	Individual	4–71	3–71
806	Bruner, Scott M.	Individual	4–79	3–72
696	Bruno, Jeanne-Marie	Park Water Company	4–675	3–426
1015	Brush, Debbie	Individual	4–79	3–72
883	Bryan, D.	Individual	4–79	3–72
563	Bryant, Gary	Individual	4–71	3–71
1269	Bryant, Richard	Individual	4–79	3–72
982	Brzeczek, Amy	Individual	4–79	3–72
999	Buech, Heidi	Individual	4–79	3–72
1129	Bunch, Christopher	Individual	4–79	3–72
1386	Burbridge, Scott	Individual	4–81	3–73
1296	Burger, Bitsa	Individual	4–79	3–72
1380	Burger, Bitsa	Individual	4–81	3–73
1332	Burgett, Jessica	Individual	4–79	3–72
1215	Burian-Mohr, Eleanor	Individual	4–79	3–72
747	Burke, Mack	Individual	4–71	3–71
481	Burnett, Jake	Individual	4–71	3–71
1384	Burton, G.	Individual	4–81	3–73
224	Buser, John Paul	Individual	4–71	3–71
1497	Bushnell, Martha	Individual	4–79	3–72
1310	Buss, Jennie	Individual	4–79	3–72
890	Busse, Barbara	Individual	4–79	3–72
392	Butterfield, Jean and Michael	Individual	4–71	3–71
1448	C., J.A.	Individual	4–71	3–71
741	Cafry, John	Individual	4–71	3–71
1341	Cahill, Tom	Individual	4–79	3–72
908	Caico, Anthony	Individual	4–79	3–72
1447	Call, Russ	Individual	4–71	3–71
262	Calvano, Rita	Individual	4–71	3–71
1087	Campbell, Amy	Individual	4–79	3–72
96	Campbell, Jack	Individual	4–241	3–151
1597	Cannon, Chris	Deleted−Duplicate of Document #119		
614	Cantrell, Chase	Individual	4–71	3–71
692	Capano, Sandra and Richard	Individual	4–71	3–71
5	Cardella, Sylvia	Individual	4–71	3–71
270	Carey, Shreya	Individual	4–71	3–71
1115	Carlson, Cathleen A.	Individual	4–79	3–72
95	Carlson, Jim	Individual	4–240	3–150

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
597	Carlson, Jim	Individual	4–71	3–71
215	Carlson, Vanessa	Individual	4–71	3–71
560	Carlson, Virginia	Individual	4–541	3–359
1230	Carmichael, Jan	Individual	4–79	3–72
794	Carr, Donna	Individual	4–79	3–72
959	Carr, Gaile & Bob	Individual	4–79	3–72
1186	Carren, Claire	Individual	4–79	3–72
1191	Carr-Fingerle, Joelyn	Individual	4–79	3–72
263	Carter, Brady	Individual	4–71	3–71
516	Case, Patricia	Individual	4–71	3–71
139	Castillo, Debbie	Individual	4–71	3–71
1418	Castlevega	Individual	4–71	3–71
1031	Caton, Barbara	Individual	4–79	3–72
986	Cavallo, Sharon	Individual	4–79	3–72
589	Cavendish, Abbey	Individual	4–71	3–71
1576	C'De Baca, Phillip	Individual	4–81	3–73
719	Celine, Audrey	Individual	4–71	3–71
723	Celine, Sherry	Individual	4–71	3–71
1348	Cerello, Robert M	Individual	4–79	3–72
703	Chalmers, Diana	Individual	4–71	3–71
688	Chambliss, Jessie B.	Deleted-Not an EIS comment		
1020	Chan, Kai	Individual	4–79	3–72
681	Chan, Victor	Individual	4–71	3–71
1160	Chase, Lisa	Individual	4–79	3–72
1394	Chase, Maureen	Individual	4–81	3–73
1566	Chase, Michael	Individual	4–81	3–73
188	Chavarria, Al	Individual	4–71	3–71
958	Chavez, Kerry	Individual	4–79	3–72
732	Chen, Jay	Deleted-Not an EIS comment		
363	Cherry	Individual	4–71	3–71
305	Chipman, Cheryl	Individual	4–71	3–71
366	Choi, Joseph	Individual	4–78	3–72
430	Chorpenning, Patrick	Individual	4–71	3–71
58	Christie, Richard Lance	Association for the Tree of Life	4–122	3–99
1352	Cirina, Cathy	Individual	4–79	3–72
1144	Clark, Brad	Individual	4–79	3–72
117	Clark, David P.	Individual	4–71	3–71
1236	Clark, Dustin	Individual	4–79	3–72
1255	Clark, Dustin	Deleted-Duplicate of Document #1236		
812	Clark, Frances	Individual	4–79	3–72
673	Clark, Monette	Individual	4–655	3–415
818	Clark, Pamela	Individual	4–79	3–72
947	Claudio, Hereen	Individual	4–79	3–72
28	Cloud, Neil B.	Southern Ute Indian Tribe	4–87	3–78
1171	Cobb, Dean	Individual	4–79	3–72
830	Coburn, Bruce	Individual	4–79	3–72
660	Coffey, Chris	Individual	4–71	3–71
333	Cohee, Terry	Individual	4–71	3–71
725	Cohen, Connie	Individual	4–71	3–71
324	Coleman, Stacy	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1249	Collins, Brian	Individual	4–79	3–72
1016	Collins, Sandra	Individual	4–79	3–72
1373	Colosimo, Joe	Individual	4–78	3–72
911	Confectioner, Vira	Individual	4–79	3–72
119	Congressional Delegation of Utah[a]	U.S. Senators and Representatives	4–283	3–174
508	Conklin, Diane	Individual	4–71	3–71
242	Conklin, Sara	Individual	4–71	3–71
245	Conner, Carolyn	Individual	4–71	3–71
1325	Conroy, Thomas	Individual	4–79	3–72
250	Cooke, Sarah	Individual	4–71	3–71
910	Cooney, Erin	Individual	4–79	3–72
1389	Copeland, Lisa	Individual	4–81	3–73
722	Coram, Betty	Individual	4–71	3–71
179	Corrales, Max	Individual	4–71	3–71
1562	Corriere, Marianne	Individual	4–81	3–73
506	Corson, Katherine E.	Individual	4–71	3–71
482	Cosmeadodge, Katherine	Individual	4–71	3–71
1524	Costa, Demelza	Individual	4–81	3–73
1506	Costa, Eileen	Individual	4–71	3–71
1421	Cowie, Laura	Individual	4–71	3–71
111	Cozzens, Dave	Individual	4–274	3–166
923	Cramer, Mary Ann	Individual	4–79	3–72
628	Cranmer, Jana	Point Loma Nazarene University	4–71	3–71
1061	Crews, Amy	Individual	4–79	3–72
551	Crick, Tim & Victoria	Individual	4–71	3–71
600	Cross, Dale	Individual	4–71	3–71
494	Cross, Janice	Individual	4–71	3–71
1131	Crowell, Sam	Individual	4–79	3–72
991	Crowley, Lawrence	Individual	4–79	3–72
571	Crysdale, Bonnie	Individual	4–71	3–71
693	Csanadi, William C. and Beata M.	Individual	4–71	3–71
714	Cuba, Bernice	Individual	4–71	3–71
1528	Cubero, Edward	Individual	4–81	3–73
1224	Cuddeback, Ken	Individual	4–79	3–72
290	Cuidera, Charles	Individual	4–71	3–71
1237	Cupp, Jonathan	Individual	4–79	3–72
435	Curley, Patricia L.	Individual	4–78	3–72
789	Curnow, Connie	Individual	4–79	3–72
248	Curtis, Cheryl	Individual	4–71	3–71
522	Dahl, Teresa & Marvin	Individual	4–71	3–71
279	Dailey-White, Laurel	Individual	4–71	3–71
957	Dameron, Susan	Individual	4–79	3–72
987	Daniels, Patricia	Individual	4–79	3–72
25	Darke, John	Individual	4–83	3–74
26	Darke, John	Individual	4–84	3–75
27	Darke, John	Individual	4–86	3−77
37	Darke, John	Individual	4–94	3–84
38	Darke, John	Deleted-Duplicate of Document #37		
42	Darke, John	Individual	4–95	3–85

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
110	Darke, John	Individual	4–270	3–164
307	Darke, John	Individual	4–312	3–192
1430	Darke, John	Individual	4–766	3–494
1093	DaSilva, Ena	Individual	4–79	3–72
1518	Daughterty, Crystal	Individual	4–81	3–73
1368	Davenport, James H.	Colorado River Commission of Nevada	4–736	3–468
269	David	Individual	4–302	3–186
61	Davidson, Dale	Individual	4–71	3–71
1152	Davidson, Jon	Individual	4–79	3–72
564	Davis, Donna	Individual	4–71	3–71
646	Davis, Jesse	Individual	4–71	3–71
192	Davis, Paul	Individual	4–71	3–71
925	Day-Evers, Julianne	Individual	4–79	3–72
1107	de Greiff, Juan	Individual	4–79	3–72
1530	De La Ossa, Farid	Individual	4–81	3–73
828	De Morelli, David	Individual	4–79	3–72
593	Deanna	Mesa Verde Middle School	4–71	3–71
1252	DeBo/Stauffer, Melanie	Individual	4–79	3–72
1182	Declario, A.	Individual	4–79	3–72
985	Dee, Diana	Individual	4–79	3–72
1059	Delker, Jennifer	Individual	4–79	3–72
1196	Dennis, Larry	Individual	4–79	3–72
1461	Denny, Rachael	Individual	4–79	3–72
1541	Derzon, Jim	Individual	4–81	3–73
596	Desai, Kinjal	Individual	4–71	3–71
1462	Deutsch, Eileen	Individual	4–79	3–72
546	Dhsurf	Individual	4–71	3–71
1271	Dicamillo, Jessica	Individual	4–79	3–72
455	Dickerman, Karen	Individual	4–71	3–71
265	Diehl, Linda Provence	Individual	4–71	3–71
1192	Diehl, Marina	Individual	4–79	3–72
1419	Diener, Evelyn	Individual	4–71	3–71
1041	Dillon, Deb	Individual	4–79	3–72
1406	Dobyns, Mary	Individual	4–71	3–71
47	Dohrenwend, John C.	Individual	4–115	3–96
429	Dohrenwend, John C.	University of Arizona	4–360	3–219
1331	Donatoni, Matthew	Individual	4–79	3–72
1096	Doob, Jennifer	Individual	4–79	3–72
695	Doran, Liza	Individual	4–71	3–71
552	Dotson, Virgina	Individual	4–71	3–71
370	Doty, Taylor	Individual	4–71	3–71
931	Dougherty, Mona	Individual	4–79	3–72
819	Dowling, Anna	Individual	4–79	3–72
1267	Drake, Cindi	Individual	4–79	3–72
1225	Drake, Mercy	Individual	4–79	3–72
422	Dreifuss, Jeanine	Shiley Center for Orthopaedic	4–71	3–71
295	Driban, Glenn	Individual	4–71	3–71
601	Drogin, Alice	Individual	4–71	3–71
749	Drogin, Ken	Individual	4–71	3–71
252	Du, Lisa	Individual	4–78	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
510	DuBois, William	Individual	4–71	3–71
1177	Dudrick, Roseann	Individual	4–79	3–72
249	Duffy, Lorrain	Individual	4–71	3–71
782	Dukes, John	Individual	4–79	3–72
750	Duncan, Michael	Individual	4–71	3–71
1521	Dunkleberger, David	Individual	4–81	3–73
154	Dunn, Barbara	Individual	4–71	3–71
1229	Dunn, Eddy	Individual	4–79	3–72
1527	Dunn, Eddy	Individual	4–81	3–73
241	Dunn, Louis	Individual	4–71	3–71
946	Dunn, Sheryl	Individual	4–79	3–72
1102	DuPont, Collette	Individual	4–79	3–72
1157	Dupre, Christine	Individual	4–79	3–72
655	dwhittemore	Individual	4–78	3–72
1465	Dye, Claire	Individual	4–79	3–72
1280	Dzienius, Susan	Individual	4–79	3–72
1501	Eddy, Jr., Daniel	Colorado River Indian Tribes	4–769	3–496
998	Edmonson, Scott	Individual	4–79	3–72
594	Edwards, David & Linda	Individual	4–78	3–72
1545	Edwards, Judi	Individual	4–81	3–73
569	Eininger, Sue	Individual	4–71	3–71
1414	Elliott, Rob	Arizona Raft Adventures, Inc.	4–78	3–72
1244	Ellis, David	Individual	4–79	3–72
1199	Embrey, Stephanie	Individual	4–79	3–72
476	Emerine, Connie	Individual	4–71	3–71
843	Emery, Michael	Individual	4–79	3–72
1487	Enders, Todd	Individual	4–79	3–72
979	Enevoldsen, David	Individual	4–79	3–72
774	English, Rebecca	Individual	4–79	3–72
1064	Erickson, Karen	Individual	4–79	3–72
1315	Esmond, Scott	Individual	4–79	3–72
332	Espanol, Joseph	Individual	4–71	3–71
1469	Estes, Douglas	Individual	4–79	3–72
1056	Evans, Dinda	Individual	4–79	3–72
1446	Evans, Laura	Individual	4–71	3–71
1240	Evans, Lauren	Individual	4–79	3–72
1050	Evans, Michael W.	Individual	4–79	3–72
1340	Evans, Nancy	Individual	4–79	3–72
728	Everist, David	Individual	4–71	3–71
1222	Ewing, Tracy	Individual	4–79	3–72
146	Fahey, Janice	Individual	4–71	3–71
1234	Fahlberg, Maureen	Individual	4–79	3–72
929	Faich, Ron	Individual	4–79	3–72
337	Falor, Beverly	Individual	4–71	3–71
185	Fanestil, Darrell D.	Individual	4–71	3–71
1569	Fanos, Nancy	Individual	4–81	3–73
1376	Farhana	Individual	4–71	3–71
587	Farrari, Kimberly	Individual	4–71	3–71
1460	Faulk, Janeen	Individual	4–79	3–72
1153	Fayman, Bruce	Individual	4–79	3–72
1385	Fedorchuk, Justina	Individual	4–81	3–73

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1026	Feijo, Babi	Individual	4–79	3–72
1200	Fein, M D	Individual	4–79	3–72
1396	Feinstein, Dianne	U.S. Senate	4–739	3–471
977	Feldman, Mark	Individual	4–79	3–72
1563	Feldman, Mark	Individual	4–81	3–73
1008	Ferguson, Tom	Individual	4–79	3–72
575	Ferrell, Jean	N. N. Jaeschke, Inc.	4–71	3–71
1359	Ferullo, Michael	Deleted-Not an EIS comment		
901	Feuer, Heather	Individual	4–79	3–72
1589	Feyne, Stephanie	Individual	4–81	3–73
1228	Fielder, Lynn	Individual	4–79	3–72
72	Fields, Sarah	Individual	4–189	3–127
79	Fields, Sarah	Sierra Club	4–205	3–135
81	Fields, Sarah	Sierra Club	4–208	3–137
103	Fields, Sarah	Sierra Club	4–256	3–157
706	Fields, Sarah M.	Glen Canyon Group	4–691	3–434
707	Fields, Sarah M.	Individual	4–733	3–466
1404	Fields, Sarah M.	Individual	4–746	3–482
254	Fink, Keith	University of San Diego	4–71	3–71
1337	Firshein, David	Individual	4–79	3–72
1123	Fischer, John	Individual	4–79	3–72
200	Fisher, Steve and Amanda	Individual	4–71	3–71
260	Fishman, Barbara	Individual	4–71	3–71
93	Fitzburgh, Mary Beth	Individual	4–235	3–149
346	Fliegel, Myron	U.S. Nuclear Regulatory Commission	4–329	3–201
469	Foletta, Lorel	Individual	4–78	3–72
996	Follingstad, Gretel	Individual	4–79	3–72
1089	Folsom, Susan	Individual	4–79	3–72
573	Fong, P.E., Leighton	Glendale Water & Power	4–569	3–374
1065	Foss, Janice	Individual	4–79	3–72
1538	Foss, Janice	Individual	4–81	3–73
718	Foster, Anthony	Individual	4–71	3–71
972	France, Catherine	Individual	4–79	3–72
969	Frank, Lee	Individual	4–79	3–72
113	Frazier, Ana Marie	Diné CARE	4–278	3–168
887	Frazier, Anne	Individual	4–79	3–72
1415	Fred	Individual	4–71	3–71
282	Frederick, Cari	Individual	4–71	3–71
731	Freed, Doris	Individual	4–71	3–71
784	Freel, Elizabeth Sloan	Individual	4–79	3–72
135	Frias, Ralph A.	Individual	4–71	3–71
1311	Fritzler, Cyndi	Individual	4–79	3–72
762	Fugit, Victoria	Individual	4–71	3–71
1480	Fuller, Michelle	Individual	4–79	3–72
1024	Futral, Joel	Individual	4–79	3–72
777	G.H., Sara	Individual	4–79	3–72
221	Gabor, Peter A.	Individual	4–71	3–71
832	Gaede, Marnie	Individual	4–79	3–72
1069	Gagomiros, Keith	Individual	4–79	3–72
382	Galassini, Dina	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
833	Gale, Jennifer	Individual	4–79	3–72
853	Galello, Pat	Individual	4–79	3–72
198	Gallagher, Bruce	Individual	4–71	3–71
1338	Galloway, Jeanette	Individual	4–79	3–72
1420	Games, John	Individual	4–78	3–72
206	Gandenberger, Daniel	Individual	4–71	3–71
1092	Ganz, Shiela	Individual	4–79	3–72
813	Garcia, Jeffery A.	Individual	4–79	3–72
950	Gardiner, Shayna	Individual	4–79	3–72
1550	Gardner, Katherine	Individual	4–81	3–73
303	Garity, Tom	Individual	4–71	3–71
1146	Garland, Wayne	Individual	4–79	3–72
237	Garmen, Jon	Individual	4–71	3–71
845	Garrett, Katherine	Individual	4–79	3–72
1464	Garvin, Michael	Individual	4–79	3–72
637	Gates, Jamie	Individual	4–71	3–71
1263	Gauthier-Campbell, Catherine	Individual	4–79	3–72
51	Geiger, John	Individual	4–71	3–71
1336	Gerety, Sheryl Lynn	Individual	4–79	3–72
627	Giannini, James	Individual	4–71	3–71
967	Gibson, Jim	Individual	4–79	3–72
661	Giffin, Patty	Individual	4–71	3–71
1299	Gilland, James	Individual	4–79	3–72
2	Gilmour, Kenneth John	Individual	4–71	3–71
799	Glazer, Steve	Individual	4–79	3–72
1590	Glazer, Steve	Individual	4–81	3–73
592	Gleason, Bill & Donna	Individual	4–71	3–71
524	Gleason, Vern & Lois	Individual	4–71	3–71
576	Goddard, Monica	Individual	4–71	3–71
663	Goddard, Terry	Office of the Attorney General	4–650	3–412
599	Goegel, Moira	Individual	4–71	3–71
882	Goggins, Alan	Individual	4–79	3–72
1297	Goitein, Ernest	Individual	4–79	3–72
656	Goldman, Richard	Individual	4–71	3–71
588	Goldstein, Candace	Individual	4–71	3–71
849	Goldstein, Judith	Individual	4–79	3–72
318	Gomez, David	Individual	4–78	3–72
988	Gonzalez, Autumn	Individual	4–79	3–72
1362	Gonzalez, Michael BA, BS, MBA, JD	UC San Diego	4–71	3–71
1407	Goodlove, Glenn	Individual	4–71	3–71
77	Goodman, Margaret	Individual	4–200	3–132
157	Gore, Douglas	Individual	4–71	3–71
1432	Gosnell, James	Individual	4–767	3–495
1454	Graham, Ariel	Individual	4–79	3–72
108	Graham, Audrey	Individual	4–267	3–163
940	Graham, Kimberley	Individual	4–79	3–72
394	Grancell, Alvin	Individual	4–78	3–72
802	Granich, Sandra	Individual	4–79	3–72
590	Grantham, Jerald	Individual	4–71	3–71
1488	Greene, Jack	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
994	Greenman, Jessea	Individual	4–79	3–72
204	Greenspan, Julie	Individual	4–71	3–71
889	Greeson, Kathryn	Individual	4–79	3–72
647	Gregg, Julie	Individual	4–71	3–71
257	Gregory, Carrie	Individual	4–71	3–71
667	Gregory, Jeannie	San Diego Natural History Museum	4–71	3–71
1476	Greiner, Tony	Individual	4–79	3–72
903	Griest, Fred	Individual	4–79	3–72
769	Griffith, Dian	Individual	4–79	3–72
926	Griffithq, Dian	Individual	4–79	3–72
658	Groenewold, Jason	Healthy Environment Alliance of Utah	4–71	3–71
1463	Groome, Malcolm	Individual	4–79	3–72
312	Gross, Bonnie	Individual	4–71	3–71
1211	Grossman, Paul B	Individual	4–79	3–72
259	Groth, Heidi	Individual	4–71	3–71
1383	Gustus, Robin	Individual	4–81	3–73
97	Hackley, Pam	Individual	4–242	3–151
345	Hackley, Pam	Individual	4–316	3–196
619	Hagen, Melena	Individual	4–71	3–71
1312	Hahler, Pamela	Individual	4–79	3–72
844	Hahn, Dr. Dee	Individual	4–79	3–72
223	Haley, Luckie	Individual	4–71	3–71
894	Hall, Brook & Linda	Individual	4–79	3–72
1037	Hall, Sarah Jane	Individual	4–79	3–72
1227	Hamel, Bob	Individual	4–79	3–72
90	Hancock, Karla	Individual	4–230	3–147
1456	Hanks, Kim	Individual	4–79	3–72
1110	Hanley, Jim	Individual	4–79	3–72
152	Hansen, Laurel	Individual	4–71	3–71
1554	Hanson, Kristin	Individual	4–81	3–73
724	Hao, Chong	Individual	4–71	3–71
1508	Harlib, Amy	Individual	4–81	3–73
1500	Harper, David	Mohave Cultural Preservation Program	4–71	3–71
1277	Harper, Laura	Individual	4–79	3–72
954	Harper, Mark	Individual	4–79	3–72
1082	Harrington, Chris	Individual	4–79	3–72
379	Harrington, John	Individual	4–71	3–71
52	Harrington, Susie	Individual	4–71	3–71
907	Harris, Kelly	Individual	4–79	3–72
94	Harrison, Bruce	Individual	4–236	3–149
933	Harrod, Katherine	Individual	4–79	3–72
937	Harrour, Linda	Individual	4–79	3–72
1022	Harte, Mary Ellen	Individual	4–79	3–72
616	Hartge, Torie	Individual	4–71	3–71
556	Hartsfield, Sam	Port of Portland	4–457	3–312
1374	Hartung, Doug	Individual	4–71	3–71
687	Harvey, Sally	Individual	4–71	3–71
391	Haselfeld, Dianne	Individual	4–71	3–71
8	Hastings, Nora Lee	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1595	Hatch, Orrin	Deleted−Duplicate of Document #119		
17	Haugen, Bob	Individual	4–71	3–71
1148	Havens, Craig	Individual	4–79	3–72
180	Hawk, Tim, Michal, and Pauline	Individual	4–71	3–71
231	Hayes, Jenna	Individual	4–71	3–71
1239	Hayes, Sara	Individual	4–79	3–72
201	Hayutin, Joyce	Individual	4–71	3–71
49	Hazen, Gary	Individual	4–71	3–71
88	Hazen, Gary	Individual	4–228	3–146
893	Healy, Leah	Individual	4–79	3–72
65	Heart, Manuel	Ute Mountain Ute Tribe	4–163	3–116
100	Hedden, Bill	Grand Canyon Trust	4–250	3–154
353	Hedden, Bill	Deleted-Replaced by Document #555		
555	Hedden, Bill	Grand Canyon Trust	4–426	3–295
1403	Hedden, Bill	Deleted-Not an EIS comment		
1490	Heilpern, Slim	Individual	4–79	3–72
1293	Heinold, Christian	Individual	4–79	3–72
962	Heinrichsdorff, G.	Individual	4–79	3–72
1264	Heintzelman, Chris	Individual	4–79	3–72
220	Hemlock, Thomas	Individual	4–71	3–71
1356	Hempel, Marilyn	Individual	4–79	3–72
1178	Henderson, Sharrie	Individual	4–79	3–72
255	Hendricks, Bonnie	EDAW, Inc.	4–71	3–71
1416	Henry, Will	Point Loma Nazarene University	4–71	3–71
875	Henze, Christine	Individual	4–79	3–72
938	Herman, Kathy	Individual	4–79	3–72
261	Hernandez, Greg and Lorie	Individual	4–71	3–71
169	Hernandez, Julie	Individual	4–71	3–71
1552	Herren, Ken	Individual	4–81	3–73
155	Herriman, Wesley and Carol	Individual	4–71	3–71
380	Herron, Rex	Individual	4–71	3–71
319	Hess, Carlene	Individual	4–71	3–71
686	Hess, John	Individual	4–71	3–71
347	Hess, John R.	Individual	4–71	3–71
1046	Hetherington, Lance	Individual	4–79	3–72
1218	Hicks, David	Individual	4–79	3–72
292	Higgins, Catherine A.	Individual	4–71	3–71
123	Hill, Lu-Gray	Individual	4–71	3–71
238	Hill, Robert D.	Individual	4–71	3–71
175	Hilliard, Lucy Bastida	Individual	4–71	3–71
116	Hinds, Don	Individual	4–71	3–71
1425	Hobbs, Terri	Individual	4–71	3–71
1410	Hobza, Tony	Individual	4–71	3–71
670	Hodge, Gordon	Individual	4–71	3–71
808	Hoffman, Wendy	Individual	4–79	3–72
441	Holenstein, Christian	Individual	4–71	3–71
326	Holgate, Frank	Individual	4–71	3–71
973	Holland, Patrick W.	Individual	4–79	3–72
1492	Hollister, Richard	Individual	4–79	3–72
1412	Holmes, Jennifer	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
222	Holmes, Linda	Individual	4–71	3–71
786	Holmes, Ronald	Individual	4–79	3–72
464	Honecker, Carl	Individual	4–71	3–71
335	Honneker, Mary	Individual	4–71	3–71
652	Horak, Benjamin	Individual	4–71	3–71
1314	Hotchkiss, John	Individual	4–79	3–72
745	Hotchkiss, Lita	Individual	4–78	3–72
1304	Houghton, Jack	Individual	4–79	3–72
735	Houston, Gail	Individual	4–71	3–71
1391	Howell, Jr., Ruben J.	Individual	4–81	3–73
1302	Hoxeng, Jessica	Individual	4–79	3–72
779	Hoyt, Jennifer	Individual	4–79	3–72
754	Huckaby, Marlene	Individual	4–71	3–71
311	Hudack, Linda	Individual	4–71	3–71
1097	Hudgins, William G.	Individual	4–79	3–72
1261	Hudson, Joan	Individual	4–79	3–72
530	Hughes, Billie Lois	Individual	4–71	3–71
759	Hughes, Sandy & Harold	Individual	4–71	3–71
1378	Hughes, Shannon	Individual	4–81	3–73
203	Hughes, Tom and Lois	Individual	4–71	3–71
1060	Hung, Eumy	Individual	4–79	3–72
448	Hunnington, Arthur	Individual	4–71	3–71
1369	Hunter, Duncan	Deleted-Not an EIS comment		
344	Huntsman, Jr. Jon M.	State of Utah	4-313	3–194
1411	Hurd, Thomas	Individual	4–78	3–72
360	Hurley, Mike and Barbara	Individual	4–71	3–71
280	Hurley, Tamara	Individual	4–71	3–71
1154	Huser, Verne	Individual	4–79	3–72
1221	Huupponen, Tristen	Individual	4–79	3–72
1433	Inaba, Nancy	Individual	4–71	3–71
572	Indergard, RG Lantz M.	Individual	4–565	3–369
869	Indermuehle, Timothy	Individual	4–79	3–72
91	Inskip, Eleanor	Individual	4–231	3–147
404	Inskip, Eleanor	Individual	4–71	3–71
624	Irwin, Constance	Point Loma Nazarene University	4–71	3–71
1125	Irwin, Craig	Individual	4–79	3–72
276	Irwin, Keith G.	Individual	4–71	3–71
1366	Isensee, Chris	Individual	4–79	3–72
1073	Ives, Brandon	Individual	4–79	3–72
532	Jackson, Henry & Jane	Individual	4–71	3–71
635	Jafry, Patricia	Individual	4–71	3–71
519	James, Gordon	Individual	4–78	3–72
365	James, Todd M.	Individual	4–78	3–72
874	Januzelli, David	Individual	4–79	3–72
1027	Jelinek, Alex	Individual	4–79	3–72
1161	Jempel, Marilyn	Individual	4–79	3–72
914	Jenkins, Basil	Individual	4–79	3–72
1511	Jenkins, Basil	Individual	4–81	3–73
964	Jenkins, Jon	Individual	4–79	3–72
462	Jenkins, Sharon	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1111	Jenvey, Lottie	Individual	4–79	3–72
1558	Jenvey, Lottie	Individual	4–81	3–73
425	Jett, Lynne	Individual	4–71	3–71
1575	Joannidis, Peter	Individual	4–81	3–73
740	John	Individual	4–71	3–71
35	Johnson, Brenda	Deleted-Withdrawn by the U.S. Department of the Interior		
822	Johnson, Emily	Individual	4–79	3–72
300	Johnson, Ferd	Individual	4–71	3–71
1038	Johnson, John	Individual	4–79	3–72
1317	Johnson, Kim	Individual	4–79	3–72
1321	Johnson, Kim	Deleted-Duplicate of Document #1317		
623	Johnston, Ashley	Individual	4–71	3–71
1136	Johnston, Bob	Individual	4–79	3–72
1095	Jones, Allan B.	Individual	4–79	3–72
23	Jones, Ed.D., Robert A.	The Empty Bell	4–71	3–71
677	Jones, Kalen	Individual	4–71	3–71
217	Jones, Laverne and R.W.	Individual	4–71	3–71
128	Jones, Patricia	Individual	4–71	3–71
1150	Jones, Penni	Individual	4–79	3–72
1536	Jorgensen, James	Individual	4–81	3–73
512	Josepho, Mary	Individual	4–71	3–71
423	Jouflas, Sandy Hughes	Individual	4–71	3–71
1450	Joyal, Lou Ann	Individual	4–79	3–72
1503	Juan-Sanders, Vivian	Inter Tribal Council of Arizona	4–770	3–498
126	Juenger, Kate	Individual	4–71	3–71
520	Julian, Christian	Individual	4–71	3–71
1442	Juskalian, Lee	Individual	4–71	3–71
1251	Kaczmarek, Periel	Individual	4–79	3–72
939	Kaehn, Max	Individual	4–79	3–72
543	Kain, Karen	Individual	4–71	3–71
433	Kain, Nancy	Individual	4–361	3–235
1055	Kaku, Agness	Individual	4–79	3–72
669	Kamala, Laura	Grand Canyon Trust	4–652	3–413
1364	Kambak, Jackie	Individual	4–78	3–72
1413	Kantola, Angela T.	Individual	4–71	3–71
414	Kanwischer, Kari	Individual	4–71	3–71
864	Kaplan, Morris	Individual	4–79	3–72
758	Karcher, Samuel	Individual	4–71	3–71
1212	Karsh, Lynn	Individual	4–79	3–72
1289	Kay, Joni	Individual	4–79	3–72
1188	Kearns, D	Individual	4–79	3–72
605	Keating, Riley	Individual	4–71	3–71
1444	Keck, Marcella L.	Individual	4–71	3–71
1155	Keefer, Nina	Individual	4–79	3–72
598	Keeler, Bruce	Red River Canoe Company	4–633	3–402
945	Keeney, Sharon	Individual	4–79	3–72
313	Keiler, Randy	Individual	4–71	3–71
338	Keliher, Pat	Individual	4–71	3–71
1043	Kelly, Alice	Individual	4–79	3–72
1335	Kemmerer, Carol	Individual	4–79	3–72
1320	Kemmerer, David	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
795	Kempter, Shahido	Individual	4–79	3–72
1040	Kennedy, Bill	Individual	4–79	3–72
702	Kent, Dan	Red Rocks Forest	4–71	3–71
53	Kercheu, Rob	Individual	4–71	3–71
963	Kerr, Barbara	Individual	4–79	3–72
243	Kerr, G.R.	Individual	4–71	3–71
807	Key, Lonnie	Individual	4–79	3–72
1139	Key, Lynda	Individual	4–79	3–72
1126	Khalsa, Mha Atma	Individual	4–79	3–72
1164	Khan, Nezer	Individual	4–79	3–72
436	Kiffmeyer, Donald	Individual	4–71	3–71
729	King, Deanna	Individual	4–71	3–71
1266	King, Jayne L	Individual	4–79	3–72
1058	Kirby, Rya	Individual	4–79	3–72
1496	Kirschbaum, Norton and Sara	Individual	4–79	3–72
1084	Kirschling, Karen	Individual	4–79	3–72
606	Kirtley, Dennie	Individual	4–71	3–71
1468	Kitchin, Millie	Individual	4–79	3–72
1140	Kite, Karen	Individual	4–79	3–72
1475	Kjonaas, Raechel	Individual	4–79	3–72
369	Klein, Chris	Individual	4–71	3–71
1198	Kleinert, Julie	Individual	4–79	3–72
1053	Kline, Laree	Individual	4–79	3–72
917	Klohr, Antonia	Individual	4–79	3–72
1270	Kluscor, Carmen	Individual	4–79	3–72
67	Knight, Carl	Ute Mountain Ute Tribe	4–171	3–119
66	Knight, Terry	Ute Mountain Ute Tribe	4–167	3–118
251	Knighton, Jesse and Jane	Individual	4–71	3–71
1443	Koda, Dennis	Individual	4–71	3–71
1273	Kollmeyer, Charlotte	Individual	4–79	3–72
836	Koo, Rebecca	Individual	4–79	3–72
523	Kosek, Shirley	Individual	4–71	3–71
826	Kosmicki, Teresa	Individual	4–79	3–72
13	Kranz, Roy	Individual	4–71	3–71
1525	Kroth, Denise	Individual	4–81	3–73
167	Kuhlman, David B.	Individual	4–71	3–71
862	Kurz, Robert R.	Individual	4–79	3–72
981	La Follette, Peter	Individual	4–79	3–72
1052	La Frinere, Rochelle	Individual	4–79	3–72
278	La Rosa, Frank and Evelyn	Individual	4–71	3–71
701	LaBlond, Juanita E.	Individual	4–71	3–71
208	LaFontaine, Paul M.	Individual	4–71	3–71
207	Lake, Mark	Individual	4–71	3–71
582	Lamm, Dorothy & Ken	Individual	4–71	3–71
213	Landa, Suzanne	Individual	4–297	3–183
886	Landau, D.	Individual	4–79	3–72
1190	Landin, Mireya	Individual	4–79	3–72
1470	Landis-Hanna, Amanda	Individual	4–79	3–72
1507	Landis-Hanna, Amanda	Individual	4–81	3–73
1303	Landowne, Deborah	Individual	4–79	3–72
1431	Landrum, Sheryl	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1168	Langdon, Christine	Individual	4–71	3–71
148	Lanphear, Michelle	Individual	4–71	3–71
1308	Laplaca, Nancy	Individual	4–79	3–72
1029	Laporte, Ryan	Individual	4–79	3–72
1039	Lareau, Audrey	Individual	4–79	3–72
1017	Larkin, Laura	Individual	4–79	3–72
323	Larson, Pete	Individual	4–71	3–71
1291	Latham, Zach	Individual	4–79	3–72
1282	Lauder, Leona L	Individual	4–79	3–72
327	Laura, Diana	Individual	4–71	3–71
870	Lawrence, Vicki	Individual	4–79	3–72
1560	Layden, Marcella	Individual	4–81	3–73
631	Lazaro, Melissa	Individual	4–71	3–71
1361	Le, Timmy	Individual	4–71	3–71
748	Leason, Mark	Individual	4–71	3–71
583	Lebkuecher, Steve	Individual	4–71	3–71
1295	Lee, Debra	Individual	4–79	3–72
1485	Leenerts, Kathleen	Individual	4–79	3–72
467	Leer, Joanne	Individual	4–71	3–71
75	Lehi, Malcom	White Mesa Ute Administration	4–197	3–130
1377	Leichtling, Suzanne	Individual	4–81	3–73
393	Lemen, Sherry	Individual	4–78	3–72
288	Lemons, Helene E.	Individual	4–71	3–71
536	LeMontre, Sue	Individual	4–397	3–257
440	Lenards, Steve	Individual	4–78	3–72
362	Lennon, Judy	Individual	4–71	3–71
641	Leon, Susie	Individual	4–71	3–71
258	Leonard, John P.	Individual	4–78	3–72
538	Leuk, Sue	Individual	4–71	3–71
951	Levin, Robert	Individual	4–79	3–72
970	Levy, Mark	Individual	4–79	3–72
620	Lewis, Bradley	Individual	4–71	3–71
1000	Lewis, Donna	Individual	4–79	3–72
868	Lewis, Gail	Individual	4–79	3–72
483	Lewis, Lois & Laurence	Individual	4–71	3–71
586	Lewis, Sandy & Mel	Individual	4–71	3–71
389	Lewis, Stephen and Mary	Individual	4–77	3–72
378	lhart	Individual	4–353	3–215
1081	Lien, David	Individual	4–79	3–72
24	Lien, David A.	Individual	4–71	3–71
906	Liese, Suzanne	Individual	4–79	3–72
727	Lill, Dave	Individual	4–71	3–71
439	Lilskippy	Individual	4–71	3–71
227	Lindbloom, Robert	Individual	4–71	3–71
863	Lippert, Virginia	Individual	4–79	3–72
98	Lippman, Bob	Castle Valley Town Council	4–243	3–151
46	Lippman, Robert	Deleted-Duplicate of Document #136		
136	Lippman, Robert	Castle Valley Town Council	4–292	3–179
793	Lisi, Julius	Individual	4–79	3–72
474	Little, Andrea	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
699	Livermore, Dave and Bellagamba, Susan	The Nature Conservancy	4–677	3–427
815	Lo, Donovan	Individual	4–71	3–71
838	Loar, Carol	Individual	4–79	3–72
798	Loeff, Peter	Individual	4–79	3–72
1578	Long, Rebecca	Individual	4–81	3–73
1520	Lord, Danyel	Individual	4–81	3–73
1565	Loscaizo-Stumpf, Merry	Individual	4–81	3–73
1581	Loucks, Robert	Individual	4–81	3–73
114	Loux, Robert	Nevada Agency for Nuclear Projects	4–281	3–171
501	Lovell, Cecila	Individual	4–71	3–71
104	Lowe, Janet	Grand County	4–258	3–158
153	Lowenberg, Herman and Grace	Individual	4–71	3–71
648	Loyko, Megan	Individual	4–71	3–71
604	Lucisano, Dominic	Mesa Verde Middle School	4–71	3–71
1365	Luckyman	Individual	4–71	3–71
165	Ludwigsndg	Individual	4–71	3–71
835	Luedecke, Alison J.	Individual	4–79	3–72
607	Lui, Samantha	Individual	4–71	3–71
881	Lyman, Anne	Individual	4–79	3–72
567	Lynch, Esq. Robert	Irrigation & Electrical Districts Association of Arizona	4–551	3–362
860	Lynn, Sheree	Individual	4–79	3–72
1284	Lyon, Jay	Individual	4–79	3–72
1350	Lyon, Kelly	Individual	4–79	3–72
143	Lyons, Holly	Individual	4–71	3–71
419	M, Ana	Individual	4–71	3–71
1272	M., Lexi	Individual	4–79	3–72
922	Maccallum, Crawford	Individual	4–79	3–72
1128	Macdonald, BC	Individual	4–79	3–72
1567	MacDougall, Mike	Individual	4–81	3–73
1512	MacKer, Bonnie	Individual	4–81	3–73
1083	Maddox, Melvyn	Individual	4–79	3–72
1564	Maddox, Melvyn	Individual	4–81	3–73
537	Maia, Maia	Individual	4–398	3–258
653	Maier, Jean	Individual	4–71	3–71
1286	Mallard, Angela	Individual	4–79	3–72
1047	Malmuth, Sonja	Individual	4–79	3–72
897	Manewal, William	Individual	4–79	3–72
1137	Manning, Alexis	Individual	4–79	3–72
780	Manto, Jonathan	Individual	4–79	3–72
1544	Manto, Jonathan	Individual	4–81	3–73
395	Manzer, Anne	Individual	4–78	3–72
1143	March, Marie	Individual	4–79	3–72
733	Marillo, Eve	Individual	4–71	3–71
984	Marine, Duke	Individual	4–79	3–72
426	Marks, Chris	Individual	4–71	3–71
1165	Markus, Mary	Individual	4–79	3–72
1517	Maron, Country	Individual	4–81	3–73
1357	Marsh, Marie	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
513	Marshall, Jan & Jim	Individual	4–71	3–71
1557	Marshall, Lisa	Individual	4–81	3–73
797	Marshall, Sandy	Individual	4–79	3–72
272	Marshall, Victoria	Individual	4–71	3–71
1248	Marsten, Catherine	Individual	4–79	3–72
368	Martin, Andrea	Individual	4–78	3–72
668	Martin, Andrea	Individual	4–71	3–71
420	Martin, Eric	Individual	4–71	3–71
349	Martin, Lori	Individual	4–71	3–71
1574	Martinsen, Paula	Individual	4–81	3–73
1253	Marugg, Cynthia	Individual	4–79	3–72
1572	Masek, Norma	Individual	4–81	3–73
1259	Mason, Barbara	Individual	4–79	3–72
879	Masters, Athena	Individual	4–79	3–72
177	Mather, Elizabeth L.	Individual	4–71	3–71
376	Matheson, Jim	Deleted, never formally submitted to DOE as a comment		
1598	Matheson, Jim	Deleted−Duplicate of Document #119		
756	Mattewson, Phillip L.	Individual	4–71	3–71
636	May, Myrna	Individual	4–71	3–71
486	McCain, Suzanne	Individual	4–71	3–71
659	McCarn, Dan	Individual	4–71	3–71
1591	McClain, Trent	Individual	4–81	3–73
105	McCleary, Jeff	Individual	4–260	3–159
127	McCleary, Jeff and Wren	Individual	4–286	3–177
1193	McClintock, Catherine	Individual	4–79	3–72
770	McCloud, Russell	Individual	4–79	3–72
56	McDaniel, LaRue	Individual	4–77	3–72
317	McDaniel, Tim	Individual	4–71	3–71
898	McDermott, Ann	Individual	4–79	3–72
36	McDermott, Patrick	Community of Bluff	4–92	3–83
460	McDonough, Nora Jane	Individual	4–78	3–72
499	McDougal, Michele	McDougal & Associates	4–71	3–71
751	McDougal, Michele	Individual	4–71	3–71
1402	McDowell, Nora	Fort Mojave Indian Tribe	4–71	3–71
700	McEwen, Marjorie Larock	Individual	4–71	3–71
502	McGrath, Anne S.	Individual	4–71	3–71
284	McKay, Linda	Individual	4–71	3–71
960	McKuhen, Susan	Individual	4–79	3–72
458	MCL Studio	Individual	4–71	3–71
6	McLaughlin, Blair	Individual	4–71	3–71
805	McLaughlin, Laurie	Individual	4–79	3–72
1088	Mclean, Sarah	Individual	4–79	3–72
710	McLeod, Al	Individual	4–71	3–71
1167	McMillan, Erik	Individual	4–79	3–72
306	McNeely, Jerry	Grand County Council	4–303	3–187
689	McNeely, Jerry	Grand County Council	4–667	3–421
283	Mecke, James	Individual	4–71	3–71
367	Medina, Edgar	Individual	4–71	3–71
1344	Meierdierck, Jay	Individual	4–79	3–72
927	Melin, Ronnie	Individual	4–79	3–72
679	Melious, Rachele	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
490	Mello, Fran	Individual	4–78	3–72
1048	Melton, Michelle	Individual	4–79	3–72
557	Members of Congress[b]	Congress of the United States	4–458	3–313
645	Mentzer, Danielle	Klassen Hall	4–71	3–71
705	Mercandetti, Ann E. Smith	Individual	4–71	3–71
412	Messenger, Thomas J.	Individual	4–71	3–71
603	Metzler, Allison	Individual	4–71	3–71
328	Mezlan, Bernice	Individual	4–71	3–71
1330	Michals, Jessica	Individual	4–79	3–72
225	Michiwiec, Sr., David F.	Individual	4–71	3–71
633	Mickle, Joanna	Individual	4–71	3–71
1213	Mierau, Gary	Individual	4–79	3–72
232	Mifflin, Robert H.	Individual	4–78	3–72
515	Millard, Charles	Individual	4–384	3–249
1542	Miller, John Davidson	Individual	4–81	3–73
1242	Miller, Lisa	Individual	4–79	3–72
1287	Miller, Nancy	Individual	4–79	3–72
872	Miller, Nathan A.	Individual	4–79	3–72
942	Miller, Paul	Individual	4–79	3–72
930	Millhollen, Candice	Individual	4–79	3–72
720	Milner, Cynthia	Individual	4–71	3–71
787	Minde, Cynthia	Individual	4–79	3–72
398	Mira, Julia	Individual	4–71	3–71
1371	Mishiwiec, Sr., David F.	Individual	4–71	3–71
1502	Mitchell, William and Leslie	Individual	4–71	3–71
416	Mnichowski, Brittany	Individual	4–71	3–71
1543	Mock, John	Individual	4–81	3–73
485	Molina, Roxanne	Individual	4–71	3–71
289	Monroe, Roby	Individual	4–71	3–71
1184	Monterroso, Sara	Individual	4–79	3–72
1587	Monterroso, Sara	Individual	4–81	3–73
578	Moody, Tom	Natural Channel Design, Inc.	4–71	3–71
432	Moore, Amanda	Individual	4–71	3–71
824	Moore, Estella	Individual	4–79	3–72
734	Moore, Evelyn	Individual	4–78	3–72
1130	Moore, Jackie	Individual	4–79	3–72
1238	Moore, Judy	Individual	4–79	3–72
776	Moore, Kristie	Individual	4–79	3–72
983	Moore, Lynne	Individual	4–79	3–72
1440	Moore, Marsha	Individual	4–71	3–71
630	Mooring, Dr. Michael	Point Loma Nazarene University	4–71	3–71
535	Moran, Mary	Individual	4–388	3–253
1001	Morander, Billy	Individual	4–79	3–72
285	Moreau, Donna	Individual	4–78	3–72
159	Moreno, Patrice	Individual	4–78	3–72
277	Morgal, Rick	Individual	4–71	3–71
130	Morgan, Doc	Individual	4–71	3–71
1399	Morgan, Edward C.	Town of Carefree	4–71	3–71
1203	Morgan, Jacob	Individual	4–79	3–72
76	Morgan, Manuel	San Juan County Commission	4–198	3–131

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
796	Morris, Ray	Individual	4–79	3–72
218	Morrow, Ivy	Individual	4–71	3–71
936	Morton, Jeffery	Individual	4–79	3–72
632	Moser, Alicia	Individual	4–71	3–71
355	Moskowitz, Grant	Individual	4–71	3–71
371	Moya, Jade	Individual	4–78	3–72
493	mtb35	Individual	4–71	3–71
1515	Muhs, Casey	Individual	4–81	3–73
989	Muller, Audrey	Individual	4–79	3–72
1075	Mungle, Terri	Individual	4–79	3–72
816	Munk, David	Individual	4–79	3–72
20	Munroe, Rich	Individual	4–71	3–71
621	Murahovscaia, Nadejda	Point Loma Nazarene University	4–71	3–71
372	Murico, Donna	Individual	4–71	3–71
244	Murico, Ed	Individual	4–71	3–71
1358	Musco, Danielle	Point Loma Nazarene University	4–71	3–71
1201	Nabas, Jeff	Individual	4–79	3–72
899	Nacheff, Marni	Individual	4–79	3–72
1393	Nadelman, Fred	Individual	4–81	3–73
1533	Nash, Gloria	Individual	4–81	3–73
150	Natkin, Jr., Robert E.	Individual	4–71	3–71
1106	Navarrete, Paloma	Individual	4–79	3–72
446	Nelson, Charles	Individual	4–372	3–242
350	Nelson, Karen	Individual	4–71	3–71
162	Nelson, Mark H.	Individual	4–71	3–71
1262	Nemeth, Teresa	Individual	4–79	3–72
211	Netanya	Individual	4–71	3–71
1327	Neuhauser, Alice	Individual	4–79	3–72
1156	Newcomer, David	Individual	4–79	3–72
190	Newell, James	Individual	4–71	3–71
1207	Newton, Peter	Individual	4–79	3–72
452	Nichols, Joe	Individual	4–71	3–71
850	Nicolaisen, Jaime	Individual	4–79	3–72
821	Niel, Roma	Individual	4–79	3–72
34	Nielsen, M. Gail	Individual	4–91	3–82
558	Nielson, Dianne R.	Utah Department of Environmental Quality	4–461	3–316
1226	Noah, Ian	Individual	4–79	3–72
880	Nolte, Linda PhD,	Individual	4–79	3–72
134	Noonan, Laura	Individual	4–78	3–72
591	Nordby, Vonnie	MyDAS, Inc.	4–78	3–72
492	Nordling, Thea	Individual	4–71	3–71
156	Norris, Thomas	Individual	4–71	3–71
642	Northam, Elizabeth	Individual	4–71	3–71
1466	Norton, Asiel	Individual	4–79	3–72
364	Noyes, Jessica	Individual	4–78	3–72
456	Noyes, Kirt	Individual	4–71	3–71
665	Noyes, Kurt	Individual	4–71	3–71
581	Nyman, Michael	Individual	4–71	3–71
657	Nyman, Suiko Dam	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

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1363	Nyman, Suiko Dam	Individual	4–71	3–71
101	Oblak, Denise	Utah Guides and Outfitters Association	4–254	3–156
264	Oblak, Denise	Utah Guides and Outfitters Association	4–299	3–184
1426	O'Connell, Colleen	Individual	4–71	3–71
1345	Oden, Beth	Individual	4–79	3–72
876	Odin, Jane	Individual	4–79	3–72
1275	O'Donnell, Kelly	Individual	4–79	3–72
1571	Oggiono, Nanette	Individual	4–81	3–73
610	O'Grady, Jean	Individual	4–71	3–71
384	Olazabal, Addie	EDAW, Inc.	4–71	3–71
459	Olivas, Nelson	Deleted-Not an EIS comment		
980	Olson, Ruth	Individual	4–79	3–72
1071	Oravec, Lora J.	Individual	4–79	3–72
785	Orcholski, Gerald	Individual	4–79	3–72
9	Orr, Joe	Individual	4–71	3–71
471	Orr, Nancy	Individual	4–71	3–71
671	Osborne, Ken	Individual	4–71	3–71
841	O'Shea, Desmond	Individual	4–79	3–72
1091	Osman, Kristen	Individual	4–79	3–72
396	Oster, Delores A.	Individual	4–71	3–71
697	Ostler, Jim	Individual	4–71	3–71
629	Ovando-Knutson, Cynthia	Point Loma Nazarene University	4–71	3–71
1033	Overholt, Roger	Individual	4–79	3–72
1257	Overstreet, Jan	Individual	4–79	3–72
444	Owens, Stephen A.	Arizona Department of Environmental Quality	4–362	3–236
131	Padilla, Randy	Individual	4–71	3–71
639	Pagan, Beryl	Individual	4–71	3–71
170	Painter, Robert, Anne, and Alexander	Individual	4–71	3–71
768	Paley, Jan	Individual	4–79	3–72
240	Palfy, Frank and Joy	Individual	4–71	3–71
443	Palmer, Anita	Point Loma Nazarene University	4–71	3–71
928	Palmer, Mara	Individual	4–79	3–72
1417	Pamper, John	Individual	4–78	3–72
1076	Pan, Pinky Jain	Individual	4–79	3–72
281	Papayoanou, David C.	Individual	4–71	3–71
1142	Papi, Maria	Individual	4–79	3–72
1080	Parisi-Smith, Nicole	Individual	4–79	3–72
544	Park, Conor	Individual	4–71	3–71
1194	Parker, Vaughan	Individual	4–79	3–72
1486	Parkinson, Jean	Individual	4–79	3–72
1459	Pasichnyk, Richard	Individual	4–79	3–72
602	Paterson, Lisa	Individual	4–635	3–403
1216	Patrickson, Shela	Individual	4–79	3–72
356	Patten, Terese	Individual	4–71	3–71
1422	Paul, Courtney	Individual	4–71	3–71
1424	Paul, Nichole	Individual	4–71	3–71
584	Paulson, Pamela	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

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298	Paz, Nils	Individual	4–71	3–71
498	Pearson, Candee	Individual	4–71	3–71
193	Peck, Jr., John	Individual	4–71	3–71
418	Peck, Vera	Individual	4–71	3–71
651	Pedersen, Dr. Keith	Point Loma Nazarene University	4–71	3–71
1494	Peeplez, Kelle	Individual	4–79	3–72
1254	Peer, Kevin	Individual	4–79	3–72
834	Peirce, Roger	Individual	4–79	3–72
1210	Peirce, Susan	Individual	4–79	3–72
1441	Pembersee, Gary	Individual	4–71	3–71
1305	Pena, Debbie	Individual	4–79	3–72
1100	Pennington, Heather	Individual	4–79	3–72
124	Peppin, Catherine A.	Individual	4–71	3–71
413	Peppin, Kip	Individual	4–71	3–71
1006	Perkins, Randi	Individual	4–79	3–72
852	Perry, Mary Ann Tomasko	Individual	4–79	3–72
955	Perryman, Joann	Individual	4–79	3–72
672	Peschong, Jon	Duratek Federal Services	4–654	3–414
1034	Peterson, Kimberly	Individual	4–79	3–72
638	Peterson, Tara	Individual	4–71	3–71
293	Petrig, Jason C.	Individual	4–71	3–71
314	Petrovitch, Michael	Individual	4–78	3–72
792	Petrowski, Todd	Individual	4–79	3–72
271	Pfeidough	Individual	4–71	3–71
457	Phillips, Mauricette	Individual	4–71	3–71
334	Phillips, Sally	Individual	4–71	3–71
352	Pickard, Kathy	Individual	4–71	3–71
1030	Pier, Mollie	Individual	4–79	3–72
1278	Pierce, Deborah	Individual	4–79	3–72
1023	Pierce, Roger	Individual	4–79	3–72
1326	Pierpont, Leslie	Individual	4–79	3–72
41	Pierson, Lloyd M.	Individual	4–71	3–71
654	Pilewski, Laura	Individual	4–71	3–71
976	Piloyan, Diana	Individual	4–79	3–72
1409	Pinzon, Genny	Individual	4–78	3–72
325	Piper, David	Individual	4–71	3–71
1349	Piper, Gayle	Individual	4–79	3–72
1300	Plotkin, Christine	Individual	4–79	3–72
228	Pluth, Karen	Individual	4–71	3–71
239	Pogue, Ann	Individual	4–71	3–71
62	Policaro, Don	Individual	4–71	3–71
1333	Pollard, Jason	Individual	4–79	3–72
1316	Pollock, Jeri	Individual	4–79	3–72
1577	Pooni, Ranjit	Individual	4–81	3–73
698	Pope, Carl	Sierra Club	4–71	3–71
1553	Powanda, Kim	Individual	4–81	3–73
1583	Press, Roland	Individual	4–81	3–73
1147	Price, Hedy	Individual	4–79	3–72
1375	Price, Roberta	Individual	4–78	3–72
851	Provenzano, James	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
176	Psichogios, Mary	Individual	4–71	3–71
172	Psichogios, Tom	Individual	4–71	3–71
545	Pucillo, Steve	Individual	4–71	3–71
1472	Quilici, Jill	Individual	4–79	3–72
827	Quinn, April	Individual	4–79	3–72
634	Rabello, Dianne	Point Loma Nazarene University	4–71	3–71
144	Rabiee, Sheryl	Individual	4–71	3–71
1526	Radcliffe, Donald	Individual	4–81	3–73
1556	Raddish, Leah	Individual	4–81	3–73
1066	Raghav, Shyla	Individual	4–79	3–72
763	Rains, Gail	Individual	4–79	3–72
1438	Rajgopal, Rohini	Individual	4–71	3–71
158	Rand, Stephen	Individual	4–71	3–71
138	Rand, Stephen and Carol	Individual	4–71	3–71
1172	Randall, Holly	Individual	4–79	3–72
1453	Ransom, G. Harry	Individual	4–79	3–72
904	Ransom, Jill	Individual	4–79	3–72
1498	Rashall, Rosa	Individual	4–79	3–72
184	Rasmussen, Glen McFadden	Individual	4–71	3–71
1548	Ravenstein, Kate	Individual	4–81	3–73
682	Rayner, Lisa	Individual	4–71	3–71
68	Redhouse, John	Diné CARE	4–176	3–121
266	Reed, Jess	Individual	4–78	3–72
528	Reed, Jess	Deleted-Not an EIS comment		
877	Reed, Lisa	Individual	4–79	3–72
755	Reed, Mary	Individual	4–71	3–71
107	Regehr, Ron	Individual	4–266	3–162
711	Regier, Alex	Individual	4–71	3–71
913	Reich, Andrew	Individual	4–79	3–72
1294	Reilly, Robert	Individual	4–79	3–72
1121	Reimers, Andy	Individual	4–79	3–72
149	Reinhard, Frank	Individual	4–71	3–71
209	Rekus, Dale	Individual	4–71	3–71
1437	Repp, David	Individual	4–71	3–71
1514	Rex, Carrie	Individual	4–81	3–73
800	Reyes, Fran	Individual	4–79	3–72
1347	Reynolds, Debra	Individual	4–79	3–72
1523	Reynolds, Debra	Individual	4–81	3–73
1534	Rhodes, Harriet	Individual	4–81	3–73
301	Rhodes, Steve	Individual	4–71	3–71
428	Rice, Tom	Deleted-Duplicate of Document #549		
1600	Rich, Diane	Individual	4–71	3–71
892	Richards, Susan	Individual	4–79	3–72
1205	Richardson, Matthew	Individual	4–79	3–72
140	Richardson, Tom	Individual	4–71	3–71
859	Riddell, John	Individual	4–79	3–72
1435	Ridder, Ross	Direct Marketing Resources, Inc.	4–71	3–71
1133	Riddle, Donna	Individual	4–79	3–72
885	Rieber, Emily	Individual	4–79	3–72
1235	Riley, Callie	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
1112	Riley, Deborah Cloven	Individual	4–79	3–72
1241	Riley, Raymond	Individual	4–79	3–72
219	Ringer, CE	Individual	4–71	3–71
390	Ringer, Charles E.	Individual	4–71	3–71
64	Rippy, Jeff	Deleted-Not an EIS comment		
1397	Rivera, Gloria A.	Imperial Irrigation District	4–71	3–71
539	Rivera, Madeline	Individual	4–399	3–259
1301	Roach, Kenneth	Individual	4–79	3–72
1445	Roache, Kevin	Individual	4–71	3–71
1127	Roberson, Keegan	Individual	4–79	3–72
662	Roberts, Harold	International Uranium (USA) Corporation	4–636	3–404
3	Roberts, Ricky	Northern Arizona University	4–71	3–71
574	Roberts, Robert E.	U.S. Environmental Protection Agency	4–570	3–375
15	Robins, Donna Robi	Individual	4–71	3–71
856	Robinson, Saliane	Individual	4–79	3–72
839	Robison, Anne	Individual	4–79	3–72
210	Roccoforte, Marilyn and Vito	Individual	4–71	3–71
823	Rocker, Carol	Individual	4–79	3–72
1158	Rodda, Beth	Individual	4–79	3–72
1549	Rode, Katharine	Individual	4–81	3–73
617	Rodeheaver, Vonda	Individual	4–71	3–71
1223	Roden, Tessa	Individual	4–79	3–72
386	Rodriguez, Faye	The Marika Group	4–71	3–71
1388	Rogers, Lila	Individual	4–81	3–73
10	Rogers, MD, Alan	Individual	4–71	3–71
965	Rolland, Terri	Individual	4–79	3–72
168	Romero, Julie	Individual	4–78	3–72
1151	Romero, Monika	Individual	4–79	3–72
919	Root, Charlene	Individual	4–79	3–72
133	Root, Don	Individual	4–71	3–71
1007	Rose, Pandora	Individual	4–79	3–72
463	Rosenwald, Althia	Individual	4–71	3–71
1175	Rosher, Ellen	Individual	4–79	3–72
142	Roslund, Dan	Individual	4–71	3–71
781	Ross, Aimee	Individual	4–79	3–72
4	Ross, John & Margaret	Individual	4–71	3–71
867	Ross, Marie	Individual	4–79	3–72
559	Rosson, Clay	Individual	4–537	3–357
730	Rounkles, Diane	Individual	4–78	3–72
401	Rouse, Bronwyn M.	Individual	4–78	3–72
1197	Rousselot, Patrick	Individual	4–79	3–72
1529	Royer, Erica	Individual	4–81	3–73
531	Rubacalva, Manuela	Individual	4–71	3–71
1099	Rubens, Mari	Individual	4–79	3–72
1010	Rucker, Christi	Individual	4–79	3–72
1070	Rudolph, Ana	Individual	4–79	3–72
900	Ruegg, Leona	Individual	4–79	3–72
199	Rumsey, Eric J.	Individual	4–71	3–71
1185	Russell, Dorothy	Individual	4–79	3–72
84	Russell, Steve	Individual	4–217	3–142

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
403	Rutledge, Barbara	Individual	4–78	3–72
1481	Ryan, Bela	Individual	4–79	3–72
1051	Rytina, Jenna	Individual	4–79	3–72
1360	Saith, Arun	Individual	4–71	3–71
1005	Sakacs, John	Individual	4–79	3–72
83	Sakrison, Dave	City of Moab, Mayor	4–213	3–140
488	Sakrison, Dave	City of Moab, Mayor	4–373	3–244
1479	Salgado, Diego	Individual	4–79	3–72
1204	Saltzman, Barry	Individual	4–79	3–72
1166	Samenfeld, Herbert	Individual	4–79	3–72
1516	Sampson, Christie	Individual	4–81	3–73
1042	Sams, James	Individual	4–79	3–72
1247	Samuels, Harold A	Individual	4–79	3–72
387	Sander, Luther and Eileen	Individual	4–71	3–71
1457	Sanders, Gary	Individual	4–79	3–72
1531	Sanders, Gary	Individual	4–81	3–73
643	Sandoval, Gerardo	Individual	4–71	3–71
1318	Sanford, Julie	Individual	4–79	3–72
1209	Sankey, Diana	Individual	4–79	3–72
1057	Santana, Kathryn	Individual	4–79	3–72
609	Santillo, Richard	Individual	4–71	3–71
234	Saporito, Gloria	Individual	4–71	3–71
187	saueronthegreen	Individual	4–71	3–71
829	Schacht, Troy	Individual	4–79	3–72
468	Schafer, Laura	Individual	4–71	3–71
1346	Schaffer, Gabe	Individual	4–79	3–72
189	Schaps, Jack	Individual	4–71	3–71
164	Schauer, Ellen	Individual	4–71	3–71
526	Schechter, Ann & John	Individual	4–71	3–71
1122	Scherek, Roxane	Individual	4–79	3–72
511	Schettler, Robert	Individual	4–71	3–71
1342	Schilder, Mary	Individual	4–79	3–72
1458	Schlomberg, Kurt	Individual	4–79	3–72
817	Schneider, Marilyn	Individual	4–79	3–72
336	Schoeller, Ann	Individual	4–71	3–71
497	Schroeder, Rosemary	Individual	4–71	3–71
1423	Schroeder, Sandra	Individual	4–71	3–71
496	Schubert, Gabriele	Individual	4–71	3–71
1189	Schuler, Urs	Individual	4–79	3–72
1582	Schultz, Robert	Individual	4–81	3–73
122	Schulze, Jan R. Carney	Individual	4–71	3–71
1408	Schulze, Jane Carney	Individual	4–71	3–71
1586	Schwartz, Sally	Individual	4–81	3–73
956	Schweitzer, Hilde	Individual	4–79	3–72
1011	Scianna, Maria	Individual	4–79	3–72
1049	Scott, John	Individual	4–79	3–72
932	Scott, Sidney Ramsden	Individual	4–79	3–72
847	Scotti, O. Bisogno	Individual	4–79	3–72
129	Sculpt, Lia	Individual	4–78	3–72
86	Seal, Franklin	Individual	4–222	3–144
896	Sears, Michael	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
726	Seawell, Earnest N.	Individual	4–71	3–71
1004	Sebastian, Joseph	Individual	4–79	3–72
495	See, Steve	Individual	4–71	3–71
1044	Sefton, John	Individual	4–79	3–72
1306	Segall-Anable, Linda	Individual	4–79	3–72
1104	Seidler, Chuck	Individual	4–79	3–72
29	Sellers, Charlie R.	Individual	4–78	3–72
1195	Seltzer, Robert	Individual	4–79	3–72
649	Serrano, Indra	Finch Hall A-2	4–71	3–71
1086	Seymour, Laurie S.	Individual	4–79	3–72
408	Seymour, Richard and Barbara	Individual	4–71	3–71
837	Shanahan, Timothy	Individual	4–79	3–72
373	Shanske, Donna	Individual	4–78	3–72
744	Sharon	Individual	4–71	3–71
1003	Shaw, Michael	Individual	4–79	3–72
1187	Sheets, Kevin	Individual	4–79	3–72
1256	Shelton, Brand	Individual	4–79	3–72
1062	Sherwood, Maris	Individual	4–79	3–72
846	Shively, Kelly	Individual	4–79	3–72
949	Shockley, Mark	Individual	4–79	3–72
1471	Shockley, Mark	Deleted-Duplicate of Document #949		
434	Showalter, Patricia	Individual	4–71	3–71
163	Siglin, Larry	Individual	4–71	3–71
1028	Sigmund, Chandra	Individual	4–79	3–72
1323	Signorile, Karen	Individual	4–79	3–72
22	Silberberg-Peirce, Susan	Canyonlights Slides/Photography	4–71	3–71
608	Silva, Dennis	Individual	4–71	3–71
990	Silvers, Catherine	Individual	4–79	3–72
214	Simonton, Cathy	Individual	4–71	3–71
766	Singer, Kay	Individual	4–79	3–72
205	Sinnen, Ronald	Individual	4–71	3–71
690	Sjostedt, Susanne	Deleted-Not an EIS comment		
809	Slawson, Camly	Individual	4–79	3–72
1250	Smeal, Mindy A	Individual	4–79	3–72
721	Smith, Cynthia	Individual	4–71	3–71
1398	Smith, Darrell H.	Salt Lake County Council of Governments	4–741	3–473
1401	Smith, Edward D. "Tito"	Chemehuevi Indian Tribe	4–71	3–71
431	Smith, Hector	Individual	4–71	3–71
322	Smith, Laura	Individual	4–71	3–71
132	Smith, Loura	Individual	4–71	3–71
666	Smith, Margaret	Individual	4–71	3–71
676	Smith, Stephen	Individual	4–71	3–71
1032	Smith-Hileman, Joanne	Individual	4–79	3–72
1449	Smolin, Ron	Individual	4–71	3–71
566	Snyder, Philip	Individual	4–71	3–71
1390	Sobanski, Sandra	Individual	4–81	3–73
1491	Soderlind, Johan	Individual	4–79	3–72
1176	Soraghan, Conor	Individual	4–79	3–72
1329	Souza, Michael	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
287	Sowder, Judith T.	San Diego State University	4–71	3–71
803	Spallina, Jann	Individual	4–79	3–72
1570	Spears, Nancy	Individual	4–81	3–73
1339	Specht, Chris	Individual	4–79	3–72
921	Speer, Kirsten	Individual	4–79	3–72
1181	Spencer, Gayle	Individual	4–79	3–72
952	Spensley, Gail	Individual	4–79	3–72
437	Spensley, June	Individual	4–71	3–71
466	Spicer, Duane	Individual	4–71	3–71
1145	Spitz, Marlene T.	Individual	4–79	3–72
1124	Spotts, Richard	Individual	4–79	3–72
820	Springer, Paul	Individual	4–79	3–72
765	St Raynis	Individual	4–79	3–72
120	Stafford, Michael J.	Nevada Department of Administration	4–285	3–176
427	Stafford, Richard A.	Individual	4–356	3–216
1513	Stanersen, Brad	Individual	4–81	3–73
509	Stapleton, Maureen	Deleted-Not an EIS comment		
445	Stapleton, Maureen A.	San Diego County Water Authority	4–370	3–241
361	Starbuck, Willaim L.	Individual	4–71	3–71
449	Stark, Carol	Individual	4–71	3–71
454	Stark, John	Individual	4–71	3–71
1090	Starke-Livermore, Shanna	Individual	4–79	3–72
1551	Steele, Kathleen	Individual	4–81	3–73
767	Stefanow, Jennifer	Individual	4–79	3–72
1535	Steffens, Howard	Individual	4–81	3–73
294	Steinhause, Kathy	Individual	4–71	3–71
757	Stern, Rochelle	Individual	4–78	3–72
783	Stewart, Diane	Individual	4–79	3–72
742	Stewart, Katherine	Individual	4–71	3–71
902	Stewart, Richard	Individual	4–79	3–72
63	Stewart, Robert F.	Department of Interior	4–140	3–107
712	Stiff, Anna	Individual	4–71	3–71
1094	Stimmel, Rodney	Individual	4–79	3–72
674	Stoker, David	Individual	4–71	3–71
791	Stokes, Debra	Individual	4–79	3–72
109	Stolfa, Dave	Individual	4–269	3–163
678	Stolfa, Dave	Individual	4–71	3–71
357	Stolfa, Marilyn S.	Individual	4–71	3–71
1116	Stone, Jim	Individual	4–79	3–72
216	Stoneking, Link	Individual	4–71	3–71
884	Stratford, S. J.	Individual	4–79	3–72
503	Stratton, Bill and Ferne	Individual	4–71	3–71
385	Straus, Charles R.	Individual	4–71	3–71
1002	Strauss, Mark	Individual	4–79	3–72
1483	Strawn, Lori	Individual	4–79	3–72
644	Street, Stacey	Klassen Hall	4–71	3–71
309	Strell, Lia	Individual	4–71	3–71
191	Struthers, Eileen	Individual	4–71	3–71
1260	Stutz, Kathleen G	Individual	4–79	3–72
505	Suarez, Mary	Individual	4–382	3–248

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
504	Suarez, Michael K.	Individual	4–380	3–247
1219	Suhy, Jim	Individual	4–79	3–72
1532	Sullivan, Gayle	Individual	4–81	3–73
S-1	Summary Comment #1	n/a	4–71	3–71
S-2	Summary Comment #2	n/a	4–77	3–72
S-3	Summary Comment #3	n/a	4–78	3–72
S-4	Summary Comment #4	n/a	4–78	3–72
S-5	Summary Comment #5	n/a	4–79	3–72
S-6	Summary Comment #6	n/a	4–81	3–73
760	Suplee, Serena	Individual	4–71	3–71
1429	Sussman, Deb	Individual	4–71	3–71
968	Sutphin, Madelaine	Individual	4–79	3–72
1021	Swan, Rebecca	Individual	4–79	3–72
33	Swasey, G.R. and Verla	Individual	4–90	3–81
340	Sweig, Jeanne	Individual	4–71	3–71
354	Swisshelm, Richard	Individual	4–71	3–71
1522	Szymanski, Debbie	Individual	4–81	3–73
1072	Tabib, Michael	Individual	4–79	3–72
286	Taggert, Marilyn	Individual	4–78	3–72
273	Tall, Rebecca	Individual	4–78	3–72
1482	Tamminen, Lenn	Individual	4–79	3–72
82	Tanner, Rex	Grand County Council	4–210	3–139
118	Taparauskas, Irene	Individual	4–71	3–71
54	Tate, LaVerne	Individual	4–77	3–72
738	Taylor, Joanne A.	Individual	4–71	3–71
1473	Taylor, Linda Lee	Individual	4–79	3–72
971	Taylor, Robert	Individual	4–79	3–72
1324	Taylor, Steven	Individual	4–79	3–72
704	Terebey, Nicholas	Individual	4–71	3–71
1019	Terhune, Jennifer	Individual	4–79	3–72
235	Thibault, Laura	Individual	4–71	3–71
1351	Thing, Susan	Individual	4–79	3–72
1334	Thomas, Kevin	Individual	4–79	3–72
1134	Thomas, Kim	Individual	4–79	3–72
1138	Thomas, Lori	Individual	4–79	3–72
417	Thompson, David	San Diego Community College District	4–71	3–71
409	Thompson, David A.	Kearny High Educational Center	4–71	3–71
415	Thompson, Eleanor	Individual	4–71	3–71
421	Thompson, Mr.	Kearny High School	4–71	3–71
1367	Thompson, Mr.	Deleted-Duplicate of Document #421		
12	Thompson, Robert R.	Individual	4–71	3–71
804	Thompson, Stephen	Individual	4–79	3–72
106	Thuesen, Jim	Individual	4–263	3–161
527	Tielens, Arthur J.	A.J. Tielens and Associates	4–386	3–250
675	Ting, Jantrue	Individual	4–71	3–71
330	Tiontek, Tana	Individual	4–71	3–71
491	Tiwald, William	Individual	4–71	3–71
321	Tobario, Steve	Individual	4–71	3–71
1009	Tom, Janette	Individual	4–79	3–72
993	Tonsberg, B.	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
137	Town of Castle Valley	Castle Valley	4–295	3–181
343	Townsend, Roger	Individual	4–71	3–71
1509	Townshend, Arianne	Individual	4–81	3–73
944	Tracey, Kayta	Individual	4–79	3–72
542	Tran, Thuy	Individual	4–71	3–71
540	Trenholme, Howard	Individual	4–71	3–71
1054	Trimble, Robert C.	Individual	4–79	3–72
1208	Triplett, Tia	Individual	4–79	3–72
197	Trogden, Stephanie	Individual	4–71	3–71
21	Truax, Wayne	Individual	4–71	3–71
1231	Trujillo, Rebecca	Individual	4–79	3–72
1120	Tuckman, Roy	Individual	4–79	3–72
1355	Turek, Gabriella	Individual	4–79	3–72
14	Turkot, Patricia and Frank	Individual	4–71	3–71
1108	Tutihasi, R-Laurraine	Individual	4–79	3–72
1328	Tyler, Steve	Individual	4–79	3–72
683	Underhill, Janice	Individual	4–71	3–71
553	Underwood, Dennis	Metropolitan Water District of Southern California	4–411	3–272
1101	Urani, Thomas B.	Individual	4–79	3–72
941	V, Sakura	Individual	4–79	3–72
480	Vairo, Inge	Individual	4–71	3–71
1276	Valenzuela, Andrea	Individual	4–79	3–72
196	valindp	Individual	4–78	3–72
975	Van Zee, Drew	Individual	4–79	3–72
612	VanderZanden, Karla	Canyonlands Field Institute	4–71	3–71
1174	Vangi-Stern, Eva	Individual	4–79	3–72
92	Vaughn, Rita	Individual	4–234	3–148
405	Vega III, Vladimir	Individual	4–78	3–72
1173	Verry, James	Individual	4–79	3–72
1322	Vertrees, Gerald	Individual	4–79	3–72
397	Vestal, Rita	Individual	4–71	3–71
1078	Viglia, Peter	Individual	4–79	3–72
775	Villavicencio, Alan	Individual	4–79	3–72
1546	Vincent, Judy	Individual	4–81	3–73
195	von Eichhorn, John H.	Individual	4–71	3–71
125	von Koch, Mary	Individual	4–71	3–71
1451	Voss, Barbara	Individual	4–79	3–72
1439	Waclawik, Matthew	Individual	4–71	3–71
1103	Wagner, G. Blu	Individual	4–79	3–72
7	Wagner, Joanne L.	Individual	4–71	3–71
291	Wagner, Steve	Individual	4–71	3–71
472	Wagner, Steve	Individual	4–71	3–71
811	Wagoner, Robyn	Individual	4–79	3–72
1246	Wahose, Mare	Individual	4–79	3–72
102	Wait, Jeannine	Individual	4–255	3–157
1539	Walden, Jeanette	Individual	4–81	3–73
943	Waldref, Lois	Individual	4–79	3–72
31	Walker, Olene S.	State of Utah	4–88	3–79
861	Wallace, Sondra	Individual	4–79	3–72
1258	Wallner, Mary Ann	Individual	4–79	3–72

Table 4−2 Index of Responses by Last Name (continued)

Document ID Number	Name	Agency/Organization	Chapter 4 Page	Chapter 3 Page
377	Walsh, Justin	Individual	4–71	3–71
831	Walworth, David	Individual	4–79	3–72
1452	Waring, Dawn	Individual	4–79	3–72
1274	Warne, Pete	Individual	4–79	3–72
166	Warner, Rob	Individual	4–71	3–71
909	Warren, Betsie	Individual	4–79	3–72
1	Wates, Don	Individual	4–77	3–72
891	Watkins, Billie	Individual	4–79	3–72
618	Watkins, Cameron	Individual	4–71	3–71
479	Wayne, Erica	Individual	4–71	3–71
1162	Wayne, Jerry	Individual	4–79	3–72
299	Wayne, Vincent and Deborah	Individual	4–71	3–71
57	Webb, Chris	City of Blanding, City Manager	4–119	3–98
112	Webb, Chris	City of Blanding, City Manager	4–275	3–167
1309	Webber, Rita	Individual	4–79	3–72
684	Weber, Ivan	Weber Sustainability Consulting	4–659	3–417
1079	Weber, Majill-Lee	Individual	4–79	3–72
411	Weiler, Geoffrey and Elizabeth	Individual	4–71	3–71
1045	Weimer, Margaret	Individual	4–79	3–72
171	Weinbaum, Ben	Individual	4–71	3–71
871	Weiner, Maury	Individual	4–79	3–72
857	Weinhold, Robert	Individual	4–79	3–72
236	Weir, Barbara G. Campbell	Individual	4–71	3–71
78	Weisheit, John	Living Rivers	4–202	3–134
80	Weisheit, John	Living Rivers	4–207	3–136
89	Weisheit, John	Living Rivers	4–229	3–146
568	Weisheit, John	Living Rivers and Colorado Riverkeeper	4–553	3–364
1202	Weisz, Russel	Individual	4–79	3–72
1585	Weisz, Russell	Individual	4–81	3–73
410	Welch, Dana Franklin	Individual	4–71	3–71
895	Weller, Ross	Individual	4–79	3–72
1395	Wells, Kimball	Individual	4–81	3–73
878	Wenner, M. W.	Individual	4–79	3–72
888	Werner, Kirstyn	Individual	4–79	3–72
297	Weston, Steve C.	Padre Dam Municipal Water District	4–71	3–71
1206	Weymouth, Douglass	Individual	4–79	3–72
45	Whiskers, Thelma	White Mesa Concerned Community	4–100	3–87
70	Whiskers, Thelma	Individual	4–178	3–123
1593	Whitacre, Vickie	Individual	4–81	3–73
1283	Whitcomb, Matthew S	Individual	4–79	3–72
1292	Whitcomb, Paulette	Individual	4–79	3–72
1493	White, Sharlene	Individual	4–79	3–72
549	Whiteskunk, Selwyn	Ute Mountain Ute Tribe	4–401	3–261
151	Whitley, Joan	Individual	4–71	3–71
1068	Whitnah, Claudia	Individual	4–79	3–72
1474	Wiget Ii, Francis X.	Individual	4–79	3–72

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1285	Wilber, Douglas	Individual	4–79	3–72
160	Wilcox, Stephanie	Individual	4–71	3–71
181	Wildenthal, Bryan H.	Individual	4–71	3–71
375	Wilk, James	Individual	4–71	3–71
1579	Wilkinson, Richard	Individual	4–81	3–73
1035	Williams, Bob	Individual	4–79	3–72
1014	Williams, Charles	Individual	4–79	3–72
489	Williams, Christy	KZMU	4–71	3–71
1601	Williams, David	Deleted-Not an EIS comment		
1499	Williams, Jane	California Communities Against Toxics	4–71	3–71
1281	Williams, Janet	Individual	4–79	3–72
521	Williams, Patty Ann	Individual	4–71	3–71
1113	Williams, Seanna	Individual	4–79	3–72
788	Williams, Susan	Individual	4–79	3–72
173	Willis, Larry	Individual	4–71	3–71
451	Wilson, Jennifer	Individual	4–71	3–71
302	Wilson, Lisa	Individual	4–71	3–71
381	Wilson, Susan	Individual	4–71	3–71
514	Wiltse, David	Individual	4–71	3–71
329	Winston, Richard	Individual	4–71	3–71
1067	Winterer, Ted	Individual	4–79	3–72
934	Wiser, Steven J.	Individual	4–79	3–72
1547	Wixon, Karen	Individual	4–81	3–73
1265	Wohl, Ellen	Department of Earth Resources Colorado State University	4–79	3–72
16	Wolf, Barry	Individual	4–71	3–71
1119	Wolf, Rachel	Individual	4–79	3–72
1504	Wolfe, John	Individual	4–71	3–71
1114	Wolters, Mel	Individual	4–79	3–72
1343	Womble, Jeffrey	Individual	4–79	3–72
1427	Wong, Lauren	Individual	4–71	3–71
1170	Wong, Teresa	Individual	4–79	3–72
1245	Woo, Howard	Individual	4–79	3–72
743	Woodard, Joan	Individual	4–71	3–71
761	Woodard, Patty	Individual	4–78	3–72
1117	Woodcock, Angela	Individual	4–79	3–72
1118	Woodcock, Angela	Deleted-Duplicate of Document #1117		
533	Woodfin, Debbie	Individual	4–71	3–71
383	Wooldridge, Forrest	Individual	4–78	3–72
465	Wooley, Carol	Individual	4–71	3–71
1588	Wozniak, Shawn	Individual	4–81	3–73
341	Wright, Jane	Individual	4–78	3–72
626	Wu, John	Individual	4–71	3–71
752	Wurth, Michelle	Individual	4–71	3–71
358	Wyandt, Paul	Individual	4–71	3–71
487	Wynn, Tina	Individual	4–71	3–71
541	Yancey, William B.	Individual	4–71	3–71
268	Yang, James	Individual	4–71	3–71
55	Yazzie, Mary Jane	Individual	4–77	3–72
739	Yonker, Joanne	Individual	4–71	3–71

Table 4−2 Index of Responses by Last Name (continued)

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1149	York, Carole	Individual	4–79	3–72
948	Young, Chad	Individual	4–79	3–72
1313	Young, Jennifer	Individual	4–79	3–72
1279	Young, Mary	Individual	4–79	3–72
461	Young, Ruby	Individual	4–71	3–71
953	Youngson, Patricia	Individual	4–79	3–72
453	Yuskin, Joe	Individual	4–71	3–71
613	Z, Ariana	Mesa Verde Middle School	4–71	3–71
1074	Zahller, Guy	Individual	4–79	3–72
1478	Zamora, Delilah	Individual	4–79	3–72
680	Zapotocky, David	Individual	4–71	3–71
1105	Zarchin, Paul	Individual	4–79	3–72
873	Zeissler, Chandra	Individual	4–79	3–72
1484	Zeldas, Sandy	Individual	4–79	3–72
1400	Zimmerman, Gerald R.	Colorado River Board of California	4–742	3–478
1392	Zlevor, JoAnne	Individual	4–81	3–73
1290	Zoline, Abigail	Individual	4–79	3–72

[a]Signatories: Orrin G. Hatch, U.S. Senator
Robert F. Bennett, U.S. Senator
Chris Cannon, U.S. Representative
Jim Matheson, U.S. Representative
Rob Bishop, U.S. Representative

[b]Signatories: Jim Matheson, U.S. Representative
Chris Cannon, U.S. Representative
Grace Napolitano, U.S. Representative
David Dreier, U.S. Representative
Lucille Roybal-Allard, U.S. Representative
Bob Filner, U.S. Representative
Shelley Berkley, U.S. Representative
J.D. Hayworth, U.S. Representative
Dennis Cardoza, U.S. Representative
Susan Davis, U.S. Representative
Mark Udall, U.S. Representative
Henry Waxman, U.S. Representative
Juanita Millender-McDonald, U.S. Representative
Rick Renzi, U.S. Representative
George Miller, U.S. Representative
Rob Bishop, U.S. Representative
Joe Baca, U.S. Representative
Linda Sanchez, U.S. Representative
Raul Grijalva, U.S. Representative
Jeff Flake, U.S. Representative
Hilda Solis, U.S. Representative

Table 4–3. Index of Responses by Company/Organization

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City of Blanding	57	4−119	3–98
Community of Bluff	36	4−92	3–83
Department of Interior[b]	63	4−140	3–107
Grand County Council	306	4−303	3–187
	689	4−667	3–421
U.S. Environmental Protection Agency	574	4−570	3–375
U.S. Nuclear Regulatory Commission	346	4−329	3–201
Utah Department of Environmental Quality	558	4−461	3–316
Ute Mountain Ute Tribe	549	4−401	3–261

[a]San Juan County and the U.S. Army Corps of Engineers did not submit comments.
[b]Inclues BLM, NPS, and USF&WS comments.

4.2 Responses to Comments

This section provides DOE's response to each summary comment, comment document, or, if applicable, individual comment extracted from a comment document. The text of each comment is given, followed by DOE's response.

Document #S-1 Summary Comment #1

More than 650 commentors supported relocation of the tailings pile to an off-site location. Only a few of these commentors expressed a preference for a location; however, many of them offered at least one reason for wanting the tailings moved away from the Colorado River. Several of the commentors stated a preference to move the pile north of Moab to either Crescent Junction or Klondike Flats, and most of those said that their preferred transportation mode was rail. Some commentors stated that the White Mesa Mill site is an unacceptable location.

When a reason for relocation was provided, commentors typically identified one or more of the areas of uncertainties discussed in the EIS (Tables S−1 and 2−33) associated with on-site disposal as their reason(s) for preferring relocation. Fundamentally, they either challenged the validity of DOE’s assumptions or found the consequences of the uncertainties to be unacceptable. Most of these commentors gave at least one of the following reasons for supporting relocation:

1. Potential for long-term threat to the quality of the surface water (local and downstream) used for drinking and recreational purposes if the tailings were capped in place.
2. Potential for river migration to erode the tailings pile, with subsequent adverse impacts to human health and the aquatic environment.
3. Potential for 100-year floods and Probable Maximum Floods (PMFs) to release additional contaminants to the river, with subsequent adverse impacts to human health and the aquatic environment.
4. Potential for future releases of contaminants from a suspected but unconfirmed ammonia salt layer within the pile.
5. Potential for seismic events that would release additional contamination to the Colorado River.
6. Potential for an engineered disposal cell cover to fail.
7. Potential for future subsidence of the pile to river level, resulting in unacceptable impacts to surface water quality.
8. Greater costs in the long term if the tailings were left in place rather than relocated.
9. Visual and aesthetic concerns, which may detract from tourism.
10. The need to protect human health and the environment, no matter what the cost.

Many commentors who rejected the White Mesa Mill site as an off-site disposal location did so based on potential impacts to cultural resources, traditional cultural properties, environmental justice impacts, plants and animals, human health, and the potential for ground water contamination. In addition, many of these commentors expressed concern that the tailings pile was placed near the Colorado River in the first place or that DOE failed to take action sooner. Many also said that legislation passed in 2003 requires the tailings to be relocated.

Document #S-1 Summary Comment #1 - continued

Response:

DOE has considered the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, all responsible opposing views, and all public comments received on the draft EIS. Overall, approximately 90 percent of the 1,600 comment documents supported relocation of the tailings pile. Based on these considerations, in the final EIS DOE identifies off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4.

DOE's analyses indicate that any of the proposed action alternatives described in the EIS would provide long-term protection of human health and the environment. Moreover, DOE emphasizes that the final decision on which alternative will ultimately be selected and implemented will be announced in the Record of Decision, which DOE expects to issue in late 2005. As noted in the summary of more than 650 comments provided above, the public based its support for relocating the pile on a range of reasons. If these reasons have a common denominator, it is the belief that the on-site disposal alternative could, under certain scenarios, expose the public to unacceptable levels of radiation, expose aquatic organisms in the Colorado River to unacceptable levels of contamination, or both. While acknowledging these concerns, and while granting that they factored significantly into DOE's process of identifying its preferred alternative, DOE disagrees with the underlying premise that the on-site disposal alternative would not provide human health and environmental protection commensurate with the requirements of 40 CFR 192. DOE believes that the final disposal cell design, which would be developed in a remedial action plan after the Record of Decision is issued, would meet the requirements promulgated in 40 CFR 192 and would receive review and concurrence from the NRC, regardless of whether the on-site or the off-site disposal alternative were selected.

The following discussions address 10 major reasons cited by the public in support of relocating the pile ("1" through "10" above).

1. Potential for long-term threat to the quality of the surface water (local and downstream) used for drinking and recreational purposes if the tailings were capped in place.

Many commentors said that the tailings pile should be relocated simply because the pile contains radioactive and chemical contaminants that they believed could be dangerous for human consumption or that could someday undermine the recreational value of the Colorado River and downstream reservoirs. These commentors did not express any specific engineering or geological concerns (for example, that the cover might fail or that the site might be flooded). DOE acknowledges and respects these concerns and recognizes that they become moot if the pile were moved. However, if the on-site disposal alternative were selected, DOE believes a permanent disposal cell would be designed and constructed that would reliably isolate both radioactive and nonradioactive contaminants sufficiently to reduce the potential for short-term and long-term threats to human health and the environment to acceptable levels. The Department also believes that many of the general long-term health and safety concerns expressed in these comments may

Document #S-1 Summary Comment #1 - response continued

reflect an incomplete understanding of (1) the degree of hazard that the contaminants in the pile pose, (2) the engineering design parameters that would be imposed on an on-site disposal cell in order to meet the requirements promulgated in 40 CFR 192, (3) the probabilistic factors associated with both the credible and the beyond-credible release scenarios analyzed in the EIS, and (4) DOE's statutory obligations regarding the remediation of the Moab site.

2. Potential for river migration to erode the tailings pile, with subsequent adverse impacts to human health and the aquatic environment.

River migration was one of the most frequently raised concerns in both public comments and in comments received from cooperating agencies, including UDEQ and the EPA. Section 4.1.17 and Section 2.6 of the EIS discuss the potential for the Colorado River to migrate and damage the tailings pile if it were not relocated. There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss the opposing views on this issue (Section 2.6.4).

3. Potential for 100-year floods and PMFs to release additional contaminants to the river, with subsequent adverse impacts to human health and the aquatic environment.

In the EIS, DOE acknowledges the potential for the pile to be inundated during flood events and quantifies the impacts that could result from such inundation (Sections 4.1.1 and 4.1.3). If the on-site disposal alternative were selected, the side slopes would be armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures, which are described in Section 2.1.1.4 of the EIS, would further reduce the already highly unlikely chance of a catastrophic failure of an on-site disposal cell. The Department would evaluate the size and quantity of riprap required. If the on-site disposal alternative were selected, DOE would use the USGS data on potential flood velocities that might occur at the pile for the final design of the riprap side slopes and the barrier wall.

Section 4.1.17 of the EIS addresses the natural processes that could potentially cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks. These include impacts to downstream users, aquatic receptors, backwaters, terrestrial biota, and adjacent areas. The focus of the analysis is to evaluate the potential consequences of contaminants in the water and sediments of the Colorado River based on a significant (catastrophic) release of tailings. Although the likelihood of a significant release would be very small over the design life of an on-site disposal cell, this type of failure was evaluated to determine the potential consequences (risks).

4. Potential for future releases of contaminants from a suspected but unconfirmed ammonia salt layer within the pile.

The EIS acknowledges the possible existence of an ammonia salt layer in the upper 10 feet of the tailings pile and acknowledges that if this layer does exist, a second pulse of ammonia contamination may leach from the pile at some point beyond the regulatory period of 200 to 1,000 years if the pile were left in place (Section 4.1.3). Based on modeling, DOE estimated that

Document #S-1 Summary Comment #1 - response continued

the leaching effects of an ammonia salt layer would not be observed at the underlying water table for 1,000+ years and, in the absence of any remediation, could continue for about 440 years. DOE did not simulate this effect with the contaminant flow and transport model or estimate costs because the existence of the salt layer has not yet been confirmed and also because the regulatory time period for the design of the cell is 200 to 1,000 years (40 CFR 192). Furthermore, as discussed in the Site Observational Work Plan (SOWP) (Section 6), attenuation processes (i.e., biological degradation, sorption, etc.) make it likely that ammonia concentrations in the tailings fluid near the base of the pile would be considerably less. Uncertainties related to the potential salt layer are addressed in item #18 of Tables S−1 and 2−33 (Consequences of Uncertainty).

If the on-site disposal alternative were selected, DOE would conduct more detailed field studies to confirm or refute the existence of the salt layer. If the existence of the salt layer were confirmed, additional field studies would then be conducted to characterize and map the salt layer. Based on these characterizations, more reliable transport modeling would be undertaken and, based on the results, a decision would be made regarding the need for mitigation measures. If found to be necessary and appropriate, mitigation measures could include excavation and treatment of the salt layer, which could eliminate the concern over a secondary pulse of ammonia that might occur in the year 3100 time frame. However, given the still-unconfirmed nature of the data regarding the salt layer or its possible future impacts, DOE has not conducted additional characterization of the potential impacts and associated mitigation measures or evaluated costs beyond the material presented in the EIS.

DOE believes it is appropriate to defer the collection of more precise and accurate data with which to model the transport of an unconfirmed feature of the tailings pile because such information is not essential to a reasoned choice among the alternatives.

5. Potential for seismic events that might release additional contamination to the Colorado River.

Some commentors expressed concerns that an earthquake might cause an on-site disposal cell to fail. (Note: Other geologic processes, subsidence and incision, are addressed in item #7 of this response). DOE does not believe that seismic issues are a significant concern at the Moab site. The seismic characteristics of the Moab site are addressed in Section 3.1.1.4 of the EIS. In the vicinity of the site, the Moab Fault consists of two branches—the main Moab Fault and the west branch of the Moab Fault. No historical macroseismicity has been noted along the Moab Fault, and microseismicity studies have not revealed any earthquakes associated with the fault. The site area is in Uniform Building Code 1, indicating lowest potential for earthquake damage. A concentration of seismicity was evaluated in probabilistic seismic hazard analyses by Woodward-Clyde Federal Services (1996a, 1996b). On the basis of those analyses, the recommended design-peak horizontal acceleration was 0.18g. For a 10,000-year return period for a strong earthquake, this value provides the level of protection equivalent to that specified in 10 CFR 100, “Reactor Site Criteria.” The Moab Fault system is not considered a capable fault and does not pose a significant earthquake or surface-rupture threat to the present tailings pile.

Document #S-1 Summary Comment #1 - response continued

6. Potential for the engineered cover to fail.

Many commentors expressed concerns that an engineered cover for an on-site disposal cell might fail; in particular, they said that a constructed cover might not be able to achieve the specified water infiltration rate limit of 1×10^{-8} cm/s and that ground water and surface water could be adversely impacted. The commentors are correct that if the rate of water infiltration through the cap were greater than 1×10^{-8} cm/s, then higher ground water concentrations would result. If the rate of infiltration through the cap were a magnitude greater, at 1×10^{-7} cm/s, the ground water concentrations would be the same as under the No Action alternative. Under the No Action alternative, the proposed ground water concentration goal of 3 mg/L ammonia cannot be achieved. The No Action disposal alternative cover with a saturated hydraulic conductivity of 1×10^{-7} cm/s indicates that a maximum ground water concentration of approximately 6 mg/L ammonia would be achieved after 75 years. This concentration is twice as high as the ground water goal of 3 mg/L ammonia achievable for a 1×10^{-8} cm/s cover. Details of the No Action alternative cover are provided in Section 6 of the SOWP.

DOE agrees that a 1×10^{-8} cm/s cover may be difficult to construct. The uncertainty of the analytical modeling, which includes cover performance assumptions, and the effects on ground water remediation are discussed further in Tables S−1 and 2−33, item #1. However, based on technical literature (Howell and Shackelford 1997; Estronell and Daniel 1992) and experience with other cover designs (Albright et al. 2004), the Department has a reasonable assurance that a cover can be successfully constructed with saturated hydraulic conductivity values that meet the ground water protection strategy requirements (1×10^{-8} cm/s). Further, it is explicitly contemplated in the Uranium Mill Tailings Radiation Control Act (UMTRCA) that long-term stewardship, including monitoring and maintenance of the institutional and engineering controls, would be applied to a site to ensure long-term performance and protection of public health and the environment, and DOE would conduct such activities at the Moab site to ensure performance of the selected remedy.

7. Potential for future subsidence of the pile to river level, resulting in unacceptable future impacts to surface water quality.

Impacts associated with subsidence of the pile and river incision are discussed in Section 4.1.1.1 of the EIS. DOE agrees that these two geologic processes, subsidence (basin settling) and incision (cutting into bedrock by the Colorado River), would affect the tailings pile very slowly over very long periods of time. These processes are described in Section 3.1.1.4 of the EIS. The EIS acknowledges that incision and subsidence rates indicate that the impact to an on-site disposal cell over the 1,000-year regulatory design period would be to lower the elevation of the cell by approximately 1.4 feet in relation to the Colorado River. This would place the 100-year floodplain of the Colorado River about 1.4 feet higher on the east toe of the cell, creating a higher probability for flooding over time. This potential impact would be very long-term, and the proposed riprap side slopes would reduce the potential hazard associated with the greater exposure of the pile to periodic floodwaters. The descriptions of the barrier wall design and side slope armament in Sections 2.1.1.3 and 2.1.1.4 of the EIS have been expanded to state that riprap materials would be sized to withstand the maximum river forces recently identified by USGS and

Document #S-1 Summary Comment #1 - response continued

that the barrier wall would be of sufficient length to mitigate against river encroachment. The final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan if the on-site alternative were selected. The estimated cost range for remediation shown in Table 2−33, item #9, would accommodate materials consistent with the recent USGS report. The proposed ground water remediation would not be affected by these long-term geologic processes. Subsidence would result in the tailings coming into permanent contact with the ground water in approximately 7,000 to 10,000 years.

8. Greater costs in the long term if the tailings were left in place rather than relocated.

Many commentors expressed the opinion that, in the long term, the on-site disposal alternative would prove to be more expensive than relocating the pile. DOE does not agree with this conclusion. DOE's estimates of the comparative costs of the alternatives are presented in Section 2.7.3 and Table 2−35 of the EIS. As shown in Table 2−35, DOE estimates that the lifetime cost of the on-site disposal alternative would be about $160 million less expensive than the least expensive off-site disposal alternative. The cost estimate accuracy, as defined by the American National Standards Institute and the Association for the Advancement of Cost Engineering, is a budget estimate and is expected to fall within the range of –15 percent to +30 percent.

9. Visual and aesthetic concerns, which may detract from tourism.

DOE agrees, and the EIS acknowledges in Section 4.1.11.5, that the on-site disposal alternative would likely have unavoidable adverse impacts on visual resources. From key observational points, the predominantly smooth horizontal lines created by an on-site disposal cell would continue to create a strong contrast with the adjacent sandstone cliffs. The visual contrasts that would occur under this alternative would not be compatible with the Class II objectives that BLM has assigned to the nearby landscapes. Although DOE is not required to meet the objectives of BLM's visual resource management system on the DOE-owned Moab site, the system provides a useful way to measure the effects of a proposed action on visual resources.

With regard to the potential impact on tourism, as noted in Section 3.1.18.1 of the EIS, since 1995 tourism-recreation employment has grown by some 20 percent and now accounts for at least 45 percent of Grand County's total employment.

10. The need to protect human health and the environment, no matter what the cost.

A number of commentors said that cost was irrelevant when it comes to protecting human health and the environment and that the pile should therefore be moved, regardless of the cost. A comparison of the costs and benefits among proposed alternative actions is an accepted element in an EIS. DOE has estimated the cost of the alternatives and presents them in Section 2.7.3.

Document #S-1 Summary Comment #1 - response continued

DOE disagrees with commentors who stated that relocating the pile is the only way to ensure protection of human health and the environment. As previously noted, DOE's analysis indicates that any of the proposed action alternatives described in the EIS would provide long-term protection of human health and the environment.

In response to commentors who rejected the White Mesa Mill site as an off-site disposal location due to the greater potential for impacts to cultural resources, traditional cultural properties, environmental justice, plants and animals, human health, and the potential for ground water contamination, DOE has quantified these differences in the EIS and will give these facts and the commentors' opinions consideration in its final decision-making.

DOE disagrees with comments stating that relocation of the tailings pile is mandated by legislation.
==

Document #S-2 Summary Comment #2

Seven commentors supported relocation of the tailings to the White Mesa Mill site. The reasons given by these commentors fell into two general categories: the benefits to the local economy, and the ability of the site to reprocess or store the tailings safely.

Response:

DOE did not identify relocating the tailings pile to White Mesa Mill as its preferred surface remediation alternative for a number of reasons. DOE's preferred mode of transportation, rail, was not considered viable for White Mesa Mill due to the absence of an existing rail line and the excessive cost and impacts that would have to be incurred to construct a new rail line from Moab to White Mesa Mill. Furthermore, DOE estimates that relocating the tailings to White Mesa Mill by truck or slurry pipeline would be more expensive than moving them to Klondike Flats or Crescent Junction because of the longer distance to the White Mesa Mill site (see Table 2−35 of the EIS). Proponents for moving the tailings to White Mesa Mill by slurry pipeline stated that once tailings transportation by this method was completed, the pipeline could be reused for irrigation or other uses, which could offset the higher cost of transportation to White Mesa Mill. However, it is DOE's position that potential future uses of the pipeline, like potential future uses of the Moab site, are issues that are beyond the scope of the EIS.

As seen in Figures S−4 through S−24 and in Table 2−32 of the EIS, with the exception of maximum land disturbance (Figure S−5) and worker housing availability, there are no other areas of environmental impacts where the White Mesa Mill alternative offers a clear advantage over Klondike Flats or Crescent Junction as an off-site disposal location. Moreover, there are several areas (for example, truck traffic through Moab; travel time to ground water; impacts to wetlands, river and stream crossings, and cultural resources; fuel consumption; and power requirements) where the White Mesa Mill alternative compares poorly against the other two off-site locations. Most significant were the strong objections to the White Mesa Mill site voiced by the Native American Ute community. The White Mesa Mill alternative would result in significant unavoidable disturbances to traditional cultural properties held sacred by the Ute,

Document #S-2 Summary Comment #2 - response continued

Navajo, and Hopi cultures and people. This adverse impact was unique among the three off-site locations.

DOE recognizes that the White Mesa Mill alternative would result in a significant economic stimulus to the local economies of Blanding, Bluff, and neighboring communities. DOE also evaluated the advantages of an existing disposal facility and the existing ability of the IUC to process tailings. However, these advantages did not outweigh the preponderance of adverse and unavoidable environmental impacts that disposal at the White Mesa Mill site would necessarily entail.
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Document #S-3 Summary Comment #3

More than 50 commentors said that the environment needs to be protected, without specifying whether the tailings should be capped in place or relocated. For these commentors, the primary concern was the potential long-term threat to the quality of surface water (local and downstream) used for drinking and recreational purposes. Several also suggested isolating the tailings so that they would not affect the Colorado River.

Response:

DOE is proposing to clean up surface contamination and develop and implement a ground water compliance strategy to address contamination that resulted from historical uranium-ore processing at the Moab site.

DOE believes that both the on-site and off-site disposal alternatives described in the EIS would meet the regulatory requirements of 40 CFR 192 and would therefore protect water quality, air quality, and human and non-human health and well-being, both locally and downstream.
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Document #S-4 Summary Comment #4

Eleven commentors supported implementing the on-site disposal alternative. The two primary reasons given for their support of this alternative were as follows:

- The risks of on-site disposal are not high enough to warrant the cost to relocate the tailings.
- The on-site disposal alternative can be implemented in a manner that is protective of ground water and surface water.

Response:

DOE agrees that based on the analyses in the EIS, the estimated lifetime cost of the on-site disposal alternative would be approximately \$160 million to \$300 million less than the off-site disposal alternatives (see Section 2.7.3 and Table 2−35 of the EIS). However, in identifying a preferred alternative, DOE weighed this cost saving not only against risks, but also against the

Document #S-4 Summary Comment #4 - response continued

uncertainties that attend the on-site disposal alternative. The uncertainties and the potential cost implications that surround them are presented in Tables S−1 and 2−33 of the EIS. Many commentors who supported relocating the pile did so based on a belief that if one or more of DOE's assumptions proved to be in error (for example, the ground water model assumptions or the assumption regarding the applicable water quality compliance standard), the result could be substantially higher ground water remediation costs due to a longer remediation time frame. DOE considered the ramifications of these uncertainties, together with comparative risk and the broad-based support for relocating the tailings pile, in its decision to identify relocation of the pile to Crescent Junction by rail as its preferred surface remediation alternative.

DOE does agree with the commentors that the on-site disposal alternative is a reasonable alternative that would be able to protect human health and the environment.
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Document #S-5 Summary Comment #5

More than 640 individuals sent the following comment by electronic mail (e-mail):

"I urge you to revise or re-issue the Environmental Impact Statement (EIS) for the final reclamation of 12 million tons of uranium wastes that are contaminating the Colorado River near Moab, Utah. The final EIS should abandon the alternative of capping the radioactive waste at its current site on the bank of the Colorado River, and should instead identify a preferred alternative of moving the waste to one of two nearby Utah sites - Klondike or Crescent Junction.

"It is not acceptable to leave 12 million tons of mill wastes leaking into the Colorado River, directly in the path of a major flood. The radioactive wastes are now located in an unlined pile within the floodplain of the river and are leaking approximately 12,000−15,000 gallons per day of intensely contaminated fluids into an underground aquifer that immediately discharges into the river.

"The Klondike and Crescent Junction sites are in extremely stable, isolated areas that meet all the criteria for long-term disposal of radioactive wastes. The present location, on the other hand, fails every test for an appropriate site, since it does not provide long-term isolation from the human and natural environment below ground that will endure without the need for ongoing maintenance.

"Every possible savings from capping in place is offset by a huge risk of tailings failure. The decision to remove these mill wastes from the bank of the river is long overdue. I urge the Department of Energy to move the tailings pile away from the banks of the Colorado River to one of two sites identified above.

"Thank you for your consideration."

Document #S-5 Summary Comment #5 - continued

Response:

DOE has considered the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, all responsible opposing views, and all comments received on the draft EIS. Based on these considerations, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4 of the EIS. DOE will take all relevant factors, including those raised in this comment, into consideration in its final decision-making.

Notwithstanding its identification of off-site disposal as one of its preferred alternatives, DOE's analysis indicates that any of the proposed action alternatives described in the EIS, including the on-site disposal alternative, would provide long-term protection of human health and the environment. DOE believes that the on-site disposal alternative is a reasonable alternative and therefore cannot be eliminated from consideration if the EIS is to comply with NEPA. DOE's final decision on which alternative will ultimately be selected and implemented will be announced in the Record of Decision, which DOE expects to issue in late 2005.

DOE disagrees with the view that the on-site disposal alternative poses a "huge risk of tailings failure." On the contrary, based on the analyses in the EIS, DOE believes that the chance of a tailings pile failure during the remediation time frame under the on-site disposal alternative described in the EIS is extremely remote. The comment also suggests that the on-site disposal alternative would leave 12 million tons of mill wastes leaking into the Colorado River, directly in the path of a major flood, and would leak approximately 12,000 to 15,000 gallons per day of intensely contaminated fluids into an underground aquifer that immediately discharges into the river. With regard to contaminants leaking into the river, this assertion is incorrect because it is only under the No Action alternative that current rates of contaminant discharge to the river would continue unabated. Under either the on-site or the off-site disposal alternative, contaminated ground water would be intercepted, extracted, and treated. In fact, DOE has already implemented some interim ground water remediation actions to protect river water quality.

With regard to being in the path of a major flood, in the EIS DOE acknowledges the potential for the pile to be inundated during flooding and quantifies the impacts that could result from such inundation (Section 4.1.1 and 4.1.3). If the on-site disposal alternative were selected, the side slopes would be armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures, which are described in Section 2.1.1.4 of the EIS, would further reduce the already highly unlikely chance of a catastrophic failure of an on-site disposal cell. The Department would evaluate the size and quantity of riprap required. If the on-site disposal alternative were selected, DOE would use USGS data on potential flood velocities that might occur at the pile for the final design of the riprap side slopes and the barrier wall (USGS 2005). Section 4.1.17 of the EIS addresses the natural processes that could potentially cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks. These include impacts to downstream users, aquatic receptors, backwaters, terrestrial biota, and

Document #S-5 Summary Comment #5 - response continued

adjacent areas. The focus of the analysis is to evaluate the potential consequences of contaminants in the water and sediments of the Colorado River based on a significant (catastrophic) release of tailings. Although the likelihood of a significant release would be very small over the design life of the on-site disposal cell, this type of failure was assumed to occur in order to evaluate the potential consequences (risks).
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Document #S-6 Summary Comment #6

More than 100 individuals sent the following comment by e-mail:

"I am writing to urge your Department to recommend removing all of the radioactive waste from the floodplain of the Colorado River near Moab, Utah as soon as possible. Congress has directed your agency to protect the river and downstream communities from the threat posed by 12 million tons of radioactive waste at the Atlas Mill site. Your department has already overseen the cleanup of a number of smaller and less dangerous uranium mill sites. I am very concerned about statements in the press suggesting that your department may choose to leave this ticking time bomb on the banks of the river because it would cost less than moving the material to a safer location.

"The massive pile of radioactive waste is very unstable and is less than half a mile from the river that provides water for 25 million Americans. The site pollutes the river now, floods with some regularity, and is in an area with a history of seismic activity.

"Secretary Abraham, this is no time to cut corners. The Colorado River is too precious and too many people depend on it to allow cleanup cost and the hope of containment to dictate your department's choice of action. Please direct your staff to recommend a full and immediate cleanup of the Atlas Mill site along the Colorado River.

"Thank you for your consideration of my comments."

Response:

In its decision-making process, DOE is considering the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, all responsible opposing views, and all comments received on the draft EIS. DOE will take all relevant factors, including those raised in this comment, into consideration in its final decision-making.

If the preferred alternative is selected as the alternative that DOE will implement, current plans call for pile removal to begin approximately 2 years after issuance of a Record of Decision, characterization, design, and bidding; development of a remedial action plan; and NRC approval of the remedial action plan. A Record of Decision is anticipated in late 2005.

Document #S-6 Summary Comment #6 - response continued

Notwithstanding its identification of a preference for an off-site disposal alternative, DOE's analysis indicates that any of the proposed action alternatives described in the EIS, including the on-site disposal alternative, would provide long-term protection of human health and the environment. DOE believes that the on-site disposal alternative is a reasonable alternative. DOE's final decision on which alternative will ultimately be selected and implemented will be announced in the Record of Decision.

While acknowledging the concerns voiced in the e-mailed comments, and while granting that these concerns factored significantly into DOE's process of identifying its preferred alternative, DOE disagrees with the underlying premise that the on-site disposal alternative is a "ticking time bomb" and would not provide human health and environmental protection commensurate with the requirements of 40 CFR 192 (Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings). DOE believes that the final disposal cell design that would be developed in a remedial action plan (to be issued following the Record of Decision) would meet the requirements promulgated in 40 CFR 192 and would receive review and concurrence from the NRC, regardless of whether the on-site or the off-site disposal alternative were selected in the Record of Decision.

The comment states that the tailings pile is "very unstable" and is in a "seismically unstable location." These assertions are incorrect. The existing pile has proven to be quite stable and would be further fortified if the on-site disposal alternative were selected. The seismic characteristics of the Moab site are addressed in Section 3.1.1.4 of the EIS. In the vicinity of the site, the Moab Fault consists of two branches—the main Moab Fault and the west branch of the Moab Fault. No historical macroseismicity has been noted along the Moab Fault, and microseismicity studies have not revealed any earthquakes associated with the fault. The site area is in Uniform Building Code 1, indicating lowest potential for earthquake damage.

With regard to costs, DOE agrees that, based on the analyses in the EIS, the estimated lifetime cost of the on-site disposal alternative would be approximately $160 million to $300 million less than the off-site disposal alternatives (see Section 2.7.3 and Table 2−35 of the EIS). However, in identifying its preferred alternative, DOE weighed this cost saving not only against risks, but also against the uncertainties that attend the on-site disposal alternative. The uncertainties and the potential cost implications that surround them are presented in Table S−1 of the EIS. Many commentors who supported relocating the pile did so based on a belief that if one or more of DOE's assumptions proved to be in error (for example, the ground water model assumptions or the assumption regarding the applicable water quality compliance standard), the result could be substantially higher ground water remediation costs due to a longer remediation time frame. DOE considered the ramifications of these uncertainties, together with comparative risk and the broad-based support for relocating the tailings pile, in identifying relocation of the pile to Crescent Junction by rail as its preferred surface remediation alternative.
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Document # 25 Comment #1 Commentor: Darke, John

Looking at the December 3, 2004, Federal Register notice, pages 70256 and 70257. I appreciate that an entity-specific notice came forward with a little more actual notice.

On first impression going through the November DEIS with respect to scoping representation understanding staff response, it would appear after the fact in terms of decision-makers document final EIS. Administratively in the scoping representation, one technical aspect stood out. A member of the public plainly indicated that in terms of lateral migration, that river ice and river debris dams were diverse structures and should be considered. I see no mention of debris. Perhaps someplace buried in the technical background this has been looked at. I'm going to review the total comments further in the scoping process. I would like in terms of finding representation of technical debris so I'm going to continue to comment because there was a state publication that appears to be overlooked.

Response:

The commentor appears to be referring to a scoping comment that may have been submitted by another commentor with regard to a distinction between river ice and river debris dams. The EIS contains a discussion of the issues and concerns raised during scoping (Section 1.5.2). In the discussion of the extent and impact of contamination in the Colorado River, the EIS states:

"Another commenter stated that the problem with the Colorado River was complicated by the fact that the river could migrate in the future. Commenters stated that the potential for catastrophic floods due to ice damming on the Colorado River should be addressed in the EIS."

The EIS (Table 2−33) addresses the potential for river migration and the potential for catastrophic floods, regardless of the cause of the flood, and the consequences of these events should they occur. In particular, Section 4.1.17 discusses the potential natural processes that could cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks.

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Document #26 Comment #1 Commentor: Darke, John

By way of procedure I have a concern. The comment line mailbox is full. The procedure for getting assistance in utilizing the reading room routes through the comment line. I think most people have a respect for the hard work DOE staff would prefer the "on the record" comment line rather than rolling over to an extension.

Speaking of on the record, when the pertinent parts of the Draft Environmental Impact Statement are reviewed, as you work through understanding of the public scoping, you're left with a very short of key word sound like representation of the verbal suggestion respectfully requested on-the-record scoping process. (I'll try to speak slowly so you can copy it.)

Continuation at 11:20 a.m. My comments are about the administrative bottleneck, particularly 1.5, Public and Agency Involvement, and particularly 1.5.1. There are persons, as I recall, that cover a lot more ground than reflected in the synopsis within the Draft Environmental Impact Statement reveals with respect to scoping, dealing with particularly where the new information that has emerged in terms of the extent of ground water contamination and a very technical aspect of the proposal within the decision-makers document the DEIS. To give an example, although the 7.5-minute quadrangle geologic map makes reference to a study by the state salt deformation in the in the Paradox region I can't even pronounce even though the 7.5-minute map and the preliminary and base…

Continuation at 11:20 a.m. I was calling about the lack of referral as far as I can find to Utah State Geological and Mineral Survey Bulletin 122, 1988, Salt Deformation in the Paradox Region. I am particularly concerned because the preliminary and base maps utilize via the most available if not the most accurate 7.5-minute geology map. Probably given a [inaudible] who is based on two monographs the bulletin Geology of the Salt Valley Anticline but also in the title and Arches National Park, Grand County, Utah, also is in that Bulletin 122 tying the deformation related to the Paradox salts in the Canyonlands area of Utah. Peter W. Huntoon. I can recall understanding the hypothetical nature of that bulletin that it has residence and particularly with respect to the brine and hydrologic communication of the brine across the river and solvents work of December 2003. And I'm concerned because there was obvious professional disagreement between DOE staff and contractor staff and State of Utah staff and contractor. We have great professional opinion. So I would really like an understanding of where within the bases of the SOWP and the bases of that…

Continuation at 11:30 a.m. So I really need a better understanding and guidance of where within the technical literature available to the public. I could find a reflection of what I consider to be a pertinent bulletin, hypothetical or no, and particularly with respect to the salt/salt brine protected water. I can't find it. It keeps backing off the possibility of where the site contamination went and in the fact of different professional opinion, I feel that it is important that this is resolved promptly or at least the opportunity to comment on the discrepancy in terms of what the DOE proposes in the decision-makers' document. The public accesses this document. If I could please receive guidance as to how, in the [inaudible] of the information, I could efficiently find the reflection of that bulletin so I would have confidence that it was taken into consideration. It

Document #26 Comment #1 - continued

might be hidden in plain sight in some reference somewhere besides the 7.5-minute quadrangle map and it might be in the working papers. It just didn't show up in the reading…

…Microtectronics as a matter of fact there is a letter early on in the NRC environment…

If somehow I could receive reference to this material I would appreciate it.

Response:

The Department and its supporting technical area experts reviewed the reference identified in the comment along with all other available information relevant to the issues analyzed in the EIS. Because this reference was not used as an explicit citation in the EIS, it was not included in the public reading rooms along with other cited references.
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Document #27 Comment #1 Commentor: Darke, John

I've been researching MED AEC access activities in the area and the river road of course was a U.S. Bureau AEC road. In the process I ran across two articles, one January 1, 1953, page 1, The Times Independent, Volume 58, number 1, and December 23, 1954, number 50, of the successive volume.

As you'll recall—I'll take the second article first—in the scoping process I had concerns about the interaction of river debris and ice among other places at the bridge upstream from the Moab site. In the December 23, 1954, Number 50 on page 1 it says "Ice Jam Threatens Work on New Bridge." As you know, the old bridge was replaced after being found to be a little shaky. That's in the last column to the right, the previous article of January 1, 1953, I would like to back up. The other article and this is a correction. I'll call back.

The December 23, 1954, article had Volume 59, Number 50, dealt with the ice jam on old Highway 160 at the bridge crossing the Colorado River, that was on page 1.

The second article also deals with the new bridge and it indicates that on March 19, 1953, had Volume 58, Number 12. The title of the article…soundings for new bridge…and it indicates that essentially they found (a) the bed load to be deeper, the river cut much deeper, and that there was, I'll quote "a shear structure a false structure there which given M Bar given 0435 MAO 0435 and given Doelling's map of the 7.5 minute quadrangle…survey."

I can't find where there is documentation of that at the bridge and between 3, 4 to the extent of that still relied upon, I can't see that. So that part of March 19, 1953, I think it should be reviewed. The data is there.

Take it easy.

Response:

The EIS (Table 2−33) addresses the potential for catastrophic floods, regardless of the cause of the flood, and the consequences of these events should they occur. In particular, Section 4.1.17 discusses the potential natural processes that could cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks.
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Document #28 Comment #1 Commentor: Cloud, Neil B.—Southern Ute Indian Tribe

I have reviewed your letter regarding the DOE's proposal to clean up surface contamination and implement a ground water compliance strategy to address contamination on the Moab uranium ore processing site. At this time the Southern Ute Indian Tribe does not wish to comment. Thank you for your correspondence. In the event of inadvertent discoveries of Native American cultural sites, artifacts, or human remains, the Southern Ute Indian Tribe would appreciate immediate notification.

Should you have any questions or require additional information, please do not hesitate to contact me at the number listed below, extension 2209.

Response:

DOE appreciates the views of the Southern Ute Indian Tribe and is committed to working with the tribe should any Native American cultural sites, artifacts, or human remains be discovered during remediation of the Moab mill tailings.
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Document #31 Comment #1 Commentor: Walker, Olene S.—Former Governor, State of Utah

I am writing in concert with the approval of Governor Schwarzenegger of California, Governor Napolitano of Arizona, Governor Guinn of Nevada, and Governor Richardson of New Mexico regarding the pending decision by the Department of Energy (DOE) that will impact all downstream users of the Colorado River. A draft Environmental Impact Statement (DEIS) has been issued for the Moab Uranium Mill Tailings pile located on the banks of the Colorado River. DOE did not specify a preferred alternative for either stabilizing the pile in place or moving the pile to an alternative site away from the river. This is the only pile of tailings still left on the Colorado River. The State of Utah and many other stakeholders have consistently maintained the position that these tailings must be removed to a secure off-site location away from the river.

Response:

After carefully considering the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment. DOE will continue to consider all comments received as it finalizes its decision.
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Document #31 Comment #2 Commentor: Walker, Olene S.

We have been working for several years with the federal government to resolve many questions associated with the pile. When the site operator went bankrupt, we supported federal legislation to transfer the authority to remediate the pile to the Department of Energy. As a result, DOE was given the responsibility to manage this large volume of tailings and resultant environmental issues associated with it. For years, contaminants, including heavy metals, ammonia, and radiologics, have been entering the Colorado River from the tailings pile, degrading the overall quality of the river, and threatening several species of endangered fish. As part of the transfer of authority, federal legislation required the National Academy of Sciences (NAS) to study the remediation of the pile and provide information to DOE. NAS was clear that consideration of long-term impacts should help guide the eventual remediation decision. At this juncture in the process, after many years of technical review and study, uncertainty remains that stabilization of the tailings on-site is a responsible decision. The Utah Department of Environmental Quality will be presenting compelling arguments in their DEIS comments to suggest that the factor of the potential of river migration alone is a long-term impact that can only be mitigated by removal of the pile from the banks of the Colorado River.

Response:

DOE appreciates the active role that the State of Utah has taken in the Moab project and in the development of the EIS. In addition, DOE has provided detailed responses to the issues raised in UDEQ's more detailed comment submittal under document ID #558.
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Document #31 Comment #3 Commentor: Walker, Olene S.

There is broad support for moving the tailings from local, state, and federal stakeholders that have toiled for several years to achieve that goal. We appreciate the work accomplished and the ongoing stewardship responsibilities for the Moab Millsite by DOE. We want to make it clear that any remediation other than an off-site option is unacceptable.

Response:

DOE understands the position of the State of Utah on on-site disposal and has given this position significant consideration in identifying off-site disposal and active ground water remediation as its preferred alternatives.
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Document #33 Comment #1 Commentor: Swasey, G.R. and Verla

This message is about the Atlas tailings pile or pond ..we think it will become a downwinders mess as the wind will blow & the City of Moab and the surrounding area will be covered with radiation and chemical soil..so if your dept and the government are ready to accept the people who will be affected now and later into the years, then I would like to make a suggestion: drill wells into the tailings pile & into the bedrock, case the gravel, pipe the water to Klondike flats where it will evaporate, it can be covered or capped & the river water will come back into the pile & the pile can be capped. A concrete barrier wall will be needed between the river and the pile. Thanks for listening.

Response:

Monitoring of fugitive dust escaping from the site, in spite of DOE's ongoing active dust mitigation efforts, has not detected harmful radiological releases. This information is posted on the project web page quarterly at http://gj.em.doe.gov/moab.

Regarding the commentor's proposal to "drill wells into the tailings pile," DOE believes the commentor is suggesting dewatering the pile prior to capping in place. Such activity has been ongoing since the NRC and Atlas were attempting to close the site. More than 10,000 wicks were inserted and fluids have been drawn to the surface and evaporated. The useful life of this system is reaching its end, and as described in Section 2.1.1.2, the pile would be surcharged to induce needed settling before cap construction.
===

Document #34 Comment #1 Commentor: Nielsen, M. Gail

I worked at the mill at hite during the 1951 summer. I'm seventy seven years old and still going strong, and no ill effects from the U3O8.

Response:

Thank you for your comment.
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Document #36 Comment #1 Commentor: Community of Bluff

San Juan County Ordinance No. 1992-3 established the Bluff Service Area and specified that our board was to provide culinary water services and to manage storm water drainage, among other powers.

Bluff's culinary water supply is derived from an aquifer within the Navajo Sandstone Formation. The recharge zone of our culinary water supply lies, in part, directly under the proposed White Mesa Mill site. The flexible membrane liners at White Mesa Mill were installed in 1980 and have been shown to leak by a report conducted by Titan Environmental in 1994. Our sole culinary water supply is directly at risk from this project.

Response:

DOE acknowledges in Section 3.4.5 of the EIS that the Entrada and Navajo Sandstone aquifers are beneath the White Mesa Mill site and are separated by a significant aquitard that is approximately 1,000 feet thick. While the State of Utah is assessing the integrity of the liners currently used by IUC, DOE has seen no evidence that past or current operaions have resulted in radiological releases to these aquifers. If the White Mesa Mill site were selected as the final disposal site, then the commentor's concerns regarding the flexible membrane liners would be addressed during the actual engineering design for the cell (see Section 2.2.5).
==

Document #36 Comment #2 Commentor: Community of Bluff

Furthermore, surface runoff and other stormwater drainage flows over the White Mesa Mill site into Westwater Canyon, which then joins Cottonwood Wash, which flows right through the middle of Bluff.

Response:

This characterization of the White Mesa Mill site is included in the EIS (Section 3.4.6.1).
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Document #36 Comment #3 Commentor: Community of Bluff

Therefore, the Bluff Service Area Board of Trustees would like to express our opposition to the proposed transport of Atlas Mill tailings to White Mesa. Storage of these tailings at White Mesa would negatively affect our ability to protect our sole culinary water supply. Potentially contaminated surface runoff would impair our abilities to safely manage stormwater drainage in Bluff.

Response:

The Department acknowledges the Bluff Service Area Board of Trustees' opposition to relocating the Atlas mill tailings to the White Mesa Mill site and will give this view full consideration in its decision-making.
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Document #36 Comment #4 Commentor: Community of Bluff

The Bluff Service Area Board of Trustees voted unanimously in this matter and the people of our community are solidly behind us in our desire to protect our water supply and our health.

Thank you for considering our request that none of the Atlas Mill tailings be moved to White Mesa.

Response:

The Department acknowledges the Bluff Service Area Board of Trustees and desire of the people of Bluff, Utah, to protect their water supply and health. The EIS addresses the hydrologic and health impacts associated with this alternative in Section 4.4.
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Document #37 Comment #1 Commentor: Darke, John

Request that the recent report on the two injection recovery wells, if it could get to the library as soon as possible if it hasn't already to the reading room and a circulation copy would be a good idea. I can't request this officially for the library. But I hate to get in this sort of suspense and …if I had access to it briefly. I'm strictly interested in the information containing the data particularly, and of course the description of the boreholes and wells.

The second aspect is that I get a distinct feeling that there is a [inaudible] political activity that I feel is beginning to intrude via the labor process on the decision-making for which entails the draft of the environmental impact statement. I can't really throw stones, but I've made verbal comments via the hot line and I'm sure you've already received written comments.

I'm looking forward to the DOE staff presentation at the meeting on the 24th. There has been local preparation, so that's on the side really, but I hope it's a full presentation.

Thank you for the opportunity and all my interactions on the hot line should be comments most of them deal with process. In my previous message this morning, I indicated that I had a chance to briefly review the [inaudible] and I requested that a circulating copy go along with the archival copy at the reading room at the Grand County public library. When I went down to the references, I noticed two reference books that the staff apparently in part utilizes for, well I use them when I completely fog out and U.S. Forest Service or some concept in terms of ground water and I wonder if it might be a good idea and appropriate if the DOE could place a circulating copy of these reference materials. The decisions entail getting to the DEIS and where the DEIS evolves into the final EIS and the implementation of the decision-making process. I feel since to my mind the technical documents supporting the DEIS are excellent and the contributory materials such as that I discussed earlier this morning is a godsend that it would be helpful if the community—it's not going to be the most popular book in the stack—but that certain portions of the community have access to reference material that would further enlighten them with the tack taken by the technical person.

Response:

The commentor requests that certain documents be provided in the reading room at the Grand County library. All references used in the preparation of the EIS, technical reports, and documents that were incorporated by reference were placed in the DOE reading rooms located near the Moab site and alternative disposal sites.

The commentor also appears to question DOE's decision-making process with respect to the remediation of the Moab uranium mill tailings site. After at least 30 days following the EPA Notice of Availability of the final EIS, DOE will issue a Record of Decision that will state what its decision is, identify the alternatives considered by the agency, and state whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted and, if not, why they were not.

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Document #42 Comment #1 Commentor: Darke, John

I received, under cover of a note dated January 26 05, material which was proposed to be responsive to a request for information which is needed in order to respond to FR 6970256 and subsequent FR. I appreciate the effort made; however, I am not looking at the record which apparently, but not necessarily, was called the public reading room. If there was action of the previous committee records occurred. I feel it can be mitigated in one of the boxes. My best information of the materials that were turned over to the DOE Grand Junction Office by PricewaterhouseCoopers the 1973 preliminary survey and attached records is available. Time does not permit me on the phone to spell it out but the references in the …agency 1987 vicinity properties and I will get an email to you to substantiate this phone call.

This is a comment on the record of Federal Record 697025, September 3, 2004, and subsequent Federal Register notice. In a meeting that I attended recently, I spoke to the project director and showed that project director Figure 3−8 of "Conceptual Model, Salt Water/Freshwater Interface" found in the Remediation of the Moab Uranium Mill Tailings Grand and San Juan Counties, Utah, Draft Environmental Impact Statement. I indicated that the word "brine" in that conceptual model was misleading. As a matter of equity, I would like to place on the record that communication. Subsequently, I spoke to the project engineer, there was an illustration in the room and I drew that person's attention to a well field injection and recovery wells and a supplementary well field at the banks of the Colorado. I was speaking about the Fall 2004 performance assessment of the ground water interim action well fields at the Moab, Utah, project site dated January 2005. I pointed out that, in that you have a drawdown of the extraction wells, that you have a communication with the Colorado River … zone, resulting in piping in both directions, which I have concerns about.

This is a continuation of the comments by John Darke. I was speaking of a communication between myself and the project engineer and previously the project director. I continue to comment about DOE EM/GJ769-2004…that January 2005 record indicates…I feel there is irretrievable commitment of resources, that there was an action taken, albeit in the interim, which created a pathway between the river and the errant soils that encompasses the river between essentially contaminated on-site areas and the river. The implications are that Grand Junction project has acted, and I feel the concurrence by the NRC oversight mechanism was required for the activity exhibited by the January 2005 report. As a matter of equity, I feel that it is important when I am not asking for additional information in order to comment that it goes on the record. Some persons cannot fire off an email or whatever, but I feel that the preconceive of that situation would require immediate response. Title I is plain and it indicates that under certain circumstances, concurrence by the NRC is required. I feel this is a circumstance, again…(cut off by telephone system).

Response:

The commentor appears to question whether the interim ground water remediation actions undertaken by DOE require concurrence by NRC. As explained in Section 1.2.1 of the EIS, DOE has instituted environmental controls and interim actions at the Moab site in order to minimize potential adverse effects to human health and the environment in the short term.

Document #42 Comment #1 - response continued

Interim actions have included implementing a ground water extraction system in the summer of 2003 to reduce the mass of ground water contaminants discharging to the Colorado River. The purpose was to reduce ammonia and uranium concentrations. NRC concurrence was not required for this interim action.

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Document #43 Comment #1 Commentor: Baker, Pamela W.

After attending the local public hearing on the Moab Draft Environmental Impact Statement and reading the Executive Summary, I would urge you to move the tailings pile to the Klondike Flats location.

Response:

Comment noted.

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Document #43 Comment #2 Commentor: Baker, Pamela W.

Considering the extent of the interim actions the DOE has already instigated (i.e. restricting site access, monitoring ground and surface water, storm water management, dust suppression, pile dewatering, placement of an interim cover) you are aware of the toxicity of this pile. These activities do not even address the acknowledged reality that the extent of the contamination of vicinity properties is currently unknown.

Response:

The EIS acknowledges the existence of vicinity properties (Section 2.1.2) and includes an estimated volume of contaminated material that may require removal. Prior to the Record of Decision, DOE may perform radiological assessments on vicinity properties to determine the extent of residual radioactive materials that exceed EPA standards. After the Record of Decision, DOE would implement a complete characterization and removal program for vicinity properties.

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Document #43 Comment #3 Commentor: Baker, Pamela W.

We local citizens are concerned that the money spent on this project be well spent toward a permanent solution. We are interested in the long term results for the environment as well as human health not only for our local community, but also for the future of the downstream users of the Colorado River.

Capping the pile in place does not address a permanent solution. We do not want to spend additional funds in the future to move the pile. We want it done properly the first time. This is the cheapest alternative. Not only is the Colorado River a vital resource to our community, it is important to millions of users downstream as well as nationally for the food produced in California from its irrigation water. We cannot contaminate the future.

Response:

DOE will consider this comment in its final decision-making. Consideration of this and other comments, the analyses in the EIS, and the uncertainties has led DOE to identify off-site disposal and active ground water remediation as its preferred alternatives in the EIS.

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Document #43 Comment #4 Commentor: Baker, Pamela W.

The impact of large floods in the drainage system or local flashfloods in the Moab Valley cannot be adequately predicted. However, we do know that the power of water to move large volumes of sediment is very real. We do not want this toxic material redistributed either in our local area via flooding of the Moab Valley, nor downstream via a cataclysmic deluge. This is potentially quite expensive.

Response:

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements in 40 CFR 192.

In Section 4.1.3.1, the EIS acknowledges the potential for flooding of the tailings pile if the on-site disposal alternative were selected and quantifies the impacts that could result from such inundation. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. If on-site disposal were selected, the disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the already low probability of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. Section 4.1.17 of the EIS addresses impacts from a catastrophic cell failure. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if on-site disposal were selected.

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Document #43 Comment #5 Commentor: Baker, Pamela W.

As to known outcomes, your own executive summary on Page 19 says that onsite disposal would potentially require prohibitions on the use of ground water for drinking "in perpetuity to protect human health." On the other hand, the same paragraph states "Under the off site disposal alternatives, contaminant concentrations in the ground water under the Moab site would return to background levels after 150 years". Let's get this right the first time. Let's protect the future.

Response:

The commentor is correct that under the on-site disposal alternative, the tailings pile would be a continuing source of contamination that would maintain contaminant concentrations at levels slightly above background concentrations in the ground water and, therefore, could potentially require the application of supplemental standards (institutional controls) in perpetuity to protect human health. Under the off-site disposal alternatives, contaminant concentrations in the ground water under the Moab site would return to background levels after about 150 years, by which time active ground water remediation would have been complete and supplemental standards would no longer be needed, although due to the naturally occurring brine concentrations, the aquifer would likely be classified as limited-use forever. This comment will be considered when DOE selects the disposal site and remediation method in the Record of Decision.
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Document #45 Comment #1 Commentor: Whiskers, Thelma—White Mesa Concerned Community

This is a formal complaint in response to the fact that the Department of Energy (DOE) is discriminating on the basis of race and in a manner that could desecrate legally-protected sacred sites, devastate cultural and spiritual beliefs, and have a profound negative impact on the spiritual and cultural practices, well-being, health and environment of the White Mesa Ute people. The DOE's actions violate several Executive Orders and federal statutes.

This complaint is brought by White Mesa Concerned Community, a grassroots organization of Ute Mountain Ute tribal members from the White Mesa Ute Community. The United States Department of Energy (DOE) violated Executive Orders and other statutes by employing a defective and biased evaluation process that places the members of the White Mesa Ute Community, our sacred sites and spiritual well-being in danger. The DOE continues to consider the International Uranium Corporation (IUC) White Mesa Uranium Mill as a possible site for disposal of radioactive and toxic materials that would be transported from the defunct Atlas Uranium Mill in Moab, Utah. The White Mesa Ute Community is less than three miles from the proposed placing of the uranium tailings. This close proximity guarantees that the members of the White Mesa Ute community will suffer a disproportionate threat to their health in addition to suffering desecration to sacred and culturally significant sites, and severe negative impacts on their spiritual well-being, cultural traditions and religious practices. The DOE must therefore immediately exclude the International Uranium Corporation facility at White Mesa from consideration for the disposal of the Atlas Uranium Mill tailings.

Response:

DOE has taken no actions that discriminate on the basis of race; desecrate legally protected sacred sites; have devastated cultural and spiritual beliefs; or negatively impact spiritual and cultural practices, well-being, or the health and environment of the White Mesa Ute people. DOE agrees, however, that the actions evaluated in this EIS for the White Mesa Mill alternative, if implemented, would result in some impacts such as those described in the EIS. DOE also recognizes that these impacts would be unique to the White Mesa Ute people and, therefore, would constitute environmental justice impacts.

DOE has complied with Executive Order 12898 through its consultations with the tribes. Those consultations led to the identification of cultural resources and traditional cultural properties for all alternatives described in Chapter 3.0. DOE concurs with the commentor's identification of environmental justice impacts and has specifically identified these impacts in Section 4.4.18 and in Tables S−1 and 2−32. Section 2.6.3 and Table 2−33 acknowledge the uncertainties regarding cultural resource impacts and the costs that might be incurred for their mitigation, if such is possible. DOE will continue to consider the impacts to tribal members of all alternatives in its final decision-making.

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Document #45 Comment #2 Commentor: Whiskers, Thelma

The members of the White Mesa Ute Community are members of the Ute Mountain Ute Tribe, a federally recognized Tribe. The DOE is considering the IUC White Mesa Uranium Mill as a possible disposal site for radioactive tailings and hazardous materials from the Atlas Uranium Mill in Moab, UT (the "Moab Project") approximately 85 miles north of White Mesa. The residents, sacred sites, culture, spiritual well-being, traditions, health and environment of the White Mesa Ute Community are threatened by this proposal.

The boundary of the White Mesa Ute Community is contiguous with the IUC White Mesa Uranium Mill. Resident tribal members live approximately 2 ½ miles south of the Uranium Mill. The White Mesa Ute Community is the closest community and residential population to the IUC facility. Approximately 300 tribal members live on the White Mesa Ute Community reservation, located in southern Utah, between Blanding and Bluff.

Response:

The concerns of the White Mesa Ute Community are noted, and DOE will give them full consideration in its final decision-making. DOE has acknowledged the potential for disproportionately high and adverse impacts to the White Mesa Ute Tribe should the White Mesa Mill alternative be selected (see Section 4.4.18 of the EIS).
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Document #45 Comment #3 Commentor: Whiskers, Thelma

The White Mesa Uranium Mill was built in 1979 by Energy Fuels Nuclear, Inc. to process uranium ore from the Colorado Plateau. In 1997, IUC bought the Uranium Mill and began receiving “alternate feed material” (uranium-bearing radioactive wastes) for processing. Due to falling uranium prices, IUC suspended all U.S. mining activities in 1999 and since then the uranium mill has relied exclusively on alternate feed, which it accepts from sites across the U.S. Once the uranium is extracted, the radioactive and toxic tailings and processing chemicals are placed in tailings impoundments on site.

The IUC facility was built directly on top of and next to hundreds of profoundly sacred sites, including ancient burials and ceremonial sites. The milling and disposal of radioactive and toxic materials at the facility has had and continues to have a profound and devastating impact on the spiritual and cultural well-being of the Ute people at White Mesa, and desecrates hundreds of ancient cultural, sacred and archaeological sites at White Mesa.

The IUC facility poses a serious and disproportionate threat of environmental and health hazards for the White Mesa Ute Community. The tailings ponds, which were constructed with thin plastic liners between two layers of crushed rock, contain highly toxic and radioactive materials such as lead, uranium and sulfuric acid. It is likely that these ponds will leak, and the leak detection system in operation will not detect a leak until the groundwater below has already been contaminated.

The IUC facility also emits radioactive and toxic air pollutants including radon and thoron gases and sulfur dioxide particulates. Windblown particulates and gases travel off the IUC site and onto the White Mesa reservation. Tribal members frequently smell the toxic chemicals used during the processing of the alternate feed. Tribal members regularly witness dust blowing off site, and onto the reservation, as a result of the strong winds common to the area.

Response:

DOE recognizes that there is dissatisfaction with past and current IUC operations. The facility was sited on private land used for grazing and was assessed by an NRC EIS. At the time, the State Historic Preservation Officer found the impacts to cultural, historical, and archaeological resources to be acceptable. There were no regulations that addressed traditional cultural properties at that time. While there is much speculation regarding IUC’s operations, monitoring data required by the NRC and now the State of Utah do not support conclusions that the off-site public is being exposed to hazardous emissions. An overview of IUC’s operations is included in the EIS as Appendix G.

In this EIS, DOE has quantified health impacts to the public near the facility, including exposure pathways unique to the tribe; assessed the cumulative effects of DOE’s actions with assumed continuing IUC operations; identified impacts to cultural resources and traditional cultural properties; and acknowledged environmental justice impacts. DOE will continue to consider these impacts to tribal members in its final decision-making.
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Document #45 Comment #4 Commentor: Whiskers, Thelma

The residents of the White Mesa Ute Community are now facing a new danger. The Department of Energy (DOE) is considering IUC's White Mesa Uranium Mill as a possible disposal site for radioactive tailings and hazardous wastes from the defunct Atlas Uranium Mill in Moab, Utah, approximately 85 miles north of White Mesa. The Atlas Uranium Mill site, now called the Moab Project site, but referred to as "Atlas Uranium Mill" in this complaint, is a former uranium ore-processing facility located on the north side of the city of Moab. The Uranium Mill is sited on the west bank of the Colorado River and is less than one mile from Arches National Park. The uranium mill tailings were disposed of in a tailings impoundment on site from 1956 until 1984. The tailings pile contains roughly 11.9 million tons of tailings and covers 130 acres next to the Colorado River. In fact, the Atlas Uranium Mill tailings are currently leaking ammonia and other contaminants into the Colorado River and thus must be moved.

IUC has proposed building an 85-mile long pipeline to bring the tailings and waste from the old Atlas Uranium Mill in Moab to the IUC White Mesa facility. This pipeline would be used to slurry the wastes, mixed with water, to the White Mesa location. Massive amounts of water would be needed for this project and would consequently become contaminated. Not only is it unwise to contaminate such large amounts of a resource so valuable in this region, but the contaminated water and other waste material will also create new threats. The water would then be placed in evaporation ponds, which would mean that the contaminants would evaporate into the air, and leakage would threaten groundwater below. The health and environment of nearby residents – the White Mesa Ute Community – would be directly threatened by the "evaporation" of radioactive and toxic materials and their release into the surrounding environment, as well as from the disposal of the remaining radioactive and toxic materials.

Response:

The White Mesa Mill pipeline alternative is one of several proposed alternatives analyzed in the EIS. Impacts from this alternative, including impacts to human health, water consumption, and ground water, are systematically addressed in Section 4.4 of the EIS.

Regardless of whether, in the Record of Decision, DOE ultimately decides to transport the tailings to the White Mesa Mill site by pipeline or selects one of the other alternatives, DOE's analyses show that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192 (see Section 2.3 of the EIS). DOE is also confident that the remedial action plan would fully comply with all standards and requirements in 40 CFR 192.
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Document #45 Comment #5 Commentor: Whiskers, Thelma

The disposal of materials from the Moab Project would also interfere with the traditional cultural activities of the White Mesa Ute Community, including the gathering of local plants and herbs and subsistence hunting of local animals. Tribal members gather willows for baskets, medicinal plants for Ute “nuch” tea, berries and sage in the area near the uranium mill. White Mesa residents are concerned about the effects of contamination of these and other plants and the consequent health impacts that would result from the ingestion of contaminated plants. White Mesa is also home to deer, ducks, eagles, hawks, birds, wild dogs, prairie dogs, big horn sheep, rabbits, and porcupine. Tribal members have reported increasing numbers of tumors in some of these animals. The risk of contamination of their food impacts the ability of tribal members to hunt and practice their cultural and traditional ways.

Response:

In Section 4.4.18, Environmental Justice, DOE analyzed the potential impacts to an individual from consumption of meat from mule deer that obtained 100 percent of their food and water on and near the White Mesa Mill site. The individual was assumed to obtain 100 percent of his or her meat from these deer. Results of the analysis indicated that the individual’s risk of cancer from consuming the meat would be less than that predicted for the nearest resident.

However, DOE agrees that disproportionately high and adverse impacts to minority and low-income populations would occur under the White Mesa Mill alternative as a result of unavoidable adverse impacts on potential traditional cultural properties located on and near the White Mesa Mill site, the proposed White Mesa Mill pipeline route, the White Mesa Mill borrow area, and the Blanding borrow area (see Sections 4.4.9 and 4.5).
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Document #45 Comment #6 Commentor: Whiskers, Thelma

Approving the tailings slurry pipeline and transporting the waste from the Atlas Uranium Mill in Moab to the IUC White Mesa Uranium Mill will directly and illegally destroy and desecrate many of the ancient sacred, cultural and archaeological sites at White Mesa. The volume of the Atlas tailings exceeds the capacity of the White Mesa Uranium Mill's existing tailings ponds. As a result, two new ponds would need to be constructed. The construction of these ponds will result in the destruction and further desecration of many sacred and significant archaeological and cultural sites. The construction of the pipeline itself would also destroy archaeological and culturally significant sites. At least eight archaeological sites would be obliterated if White Mesa were chosen for the Moab wastes, many more would be threatened. Adding additional radioactive tailings and toxic materials to the site in and of itself will have a significant, profound impact by desecrating all the spiritual and cultural sites in the area, and interfering with the spiritual well-being of the Ute people.

Response:

Section 4.4.9.5 of the EIS states that 132 cultural sites eligible for inclusion in the National Register of Historic Places could be adversely affected if the tailings were relocated to the White Mesa Mill site by slurry pipeline. Also see response to comment #5.
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Document #45 Comment #7 Commentor: Whiskers, Thelma

While the DOE is considering several potential sites for the disposal of the Atlas Uranium Mill tailings, it has already removed from consideration two communities, the East Carbon landfill and an existing DOE waste site at Green River. These communities were removed from consideration in part because of the impact of the project on the residents. The residents of both East Carbon and Green River are primarily white, and those residents actually live farther from their waste sites than the Ute tribal members live from the White Mesa Uranium Mill.

Response:

As discussed in Section 2.5.2, the commercial owner/operator of the East Carbon landfill withdrew the East Carbon site from consideration, and the Green River site was eliminated because space there is limited and the site lies within the floodplain of the Green River. These sites were not eliminated because the nearby residents are white.
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Document #45 Comment #8 Commentor: Whiskers, Thelma

On December 20, 2002 the Department of Energy published in the Federal Register a “Notice of Intent to Prepare an Environmental Impact Statement and To Conduct Public Scoping Meetings, and Notice of Floodplain and Wetlands Involvement for Remediation of the Moab Uranium Tailings Site in Grand County, UT.” The content of this notice, and several actions by the DOE in carrying out this process, have had a discriminatory and disproportionate impact on the low-income, people of color of the White Mesa Ute Community.

The notice, and subsequent information and presentations provided by the DOE, failed to mention the existence of the White Mesa Ute community, let alone mention the proximity of the community to the White Mesa Uranium Mill. Discussion of other potential sites, such as East Carbon and Green River, very clearly referenced the nearby community. However, White Mesa, located adjacent to the IUC facility, was completed omitted, as though it does not exist. No mention of the White Mesa Ute Community was made in the initial DOE documents, maps, or the Federal Register announcement.

At the January 22, 2003 scoping meeting in Moab, Utah, and the January 23, 2003 scoping meetings at White Mesa and in Blanding, the DOE displayed a large map that again omitted the White Mesa Ute Community. Written information containing a map that omitted the community was distributed to the participants. Consequently, members of the public being asked to participate in the scoping process were given flawed and inaccurate information to comment on. People who would have commented on the proximity of the White Mesa Ute Community reservation during the scoping process were not provided accurate information. Thus, they were denied their right to participate in the National Environmental Protection Act (NEPA) scoping process as informed citizens.

The omission of White Mesa from the DOE’s Notice of Intent and from their original maps for this project seriously taints the idea of an informed, fair and participatory process. As a result, this process has a significant discriminatory and disproportionate impact on the residents of the White Mesa Ute Community.

Response:

Maps in the draft EIS and the final EIS showing the White Mesa Mill site also depict the White Mesa Ute community and Ute Mountain Indian Reservation (see Figures 2−2, 3−38, and 3−40). Additionally, DOE held two public information meetings about the draft EIS in the community of White Mesa (at the White Mesa Ute Recreation Center)—one on June 18, 2003, and the other on January 27, 2005. These meetings were advertised in advance in local newspapers and radio stations, on flyers, and through numerous letters and phone calls to Ute Tribe representatives.
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Document #45 Comment #9 Commentor: Whiskers, Thelma

Despite the inaccurate representations of the presence of the Ute community, Ute tribal members and others attended the scoping meetings. They repeatedly and strenuously opposed the IUC proposal for a slurry line, citing profound cultural, environmental and health impacts of the proposed project. They submitted written and oral comments to the DOE, documenting why IUC's White Mesa facility should be eliminated from consideration.

Response:

DOE acknowledges the opposition of the Ute community to the White Mesa Mill disposal alternative based on cultural, environmental, and health concerns. However, DOE has also received written comments from other organizations (i.e., San Juan County, City of Blanding) that supported a slurry pipeline to White Mesa Mill. NEPA requires that DOE consider all reasonable alternatives in the EIS.

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Document #45 Comment #10 Commentor: Whiskers, Thelma

On September 14, 2003 the DOE held a "consultation" between DOE officials and Ute tribal governments in Moab, Utah. The purpose of the "consultation" was to identify how each off-site disposal plan could affect tribal cultural resources and practices, as well as water and air pollution. White Mesa tribal members, along with official representatives of the Ute Mountain Ute Tribe and other Ute tribes, attended this meeting and emphasized the importance of removing White Mesa from the list of possible disposal sites for the Moab tailings. Tribal officials expressed outrage that other potential sites (East Carbon and Green River) were eliminated from consideration, but White Mesa was still being considered, even though the White Mesa Ute Community is directly adjacent to the IUC facility. Tribal officials also denounced the DOE's continued ignoring of the fact that disposal of the Atlas tailings at White Mesa would have a tremendous negative cultural and spiritual impact on their people, wellbeing, traditions and culture. Tribal officials expressed their belief that this meeting did not qualify as a legitimate "government to government consultation," as the DOE was ignoring all the concerns of the tribes.

Response:

DOE believes it has been conscientious in contacting and meeting with as many tribal entities as possible to listen to concerns and receive input on DOE's proposals. In April 2003, DOE initiated the consultation process by notifying potentially interested stakeholders that DOE was preparing a draft EIS. A total of 38 representatives from 14 Native American tribes and the Navajo Utah Commission were contacted by mail and telephone. To date, the Ute Mountain Ute Tribe (including the White Mesa Ute Tribe), Southern Ute Indian Tribe, Uintah-Ouray Ute Tribe, Navajo Nation (including Aneth Chapter, Red Mesa Chapter, and Oljato Chapter), Navajo Utah Commission, and Hopi Tribe have expressed interest in or concerns with DOE's proposed alternatives. DOE has personally met with representatives of all the concerned groups. DOE's subcontracted professional ethnographer has also met on a number of occasions with tribal representatives. The Ute Mountain Ute Tribe is a cooperating agency on the EIS. DOE takes its tribal consultation responsibilities seriously and will continue to meet with interested tribal representatives. Also, see response to comment #9.

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Document #45 Comment #11 Commentor: Whiskers, Thelma

On November 30, 2004 the Department of Energy released a Draft Environmental Impact Statement setting forth what the DOE says are the "full range of reasonable alternatives and associated environmental effects of significant federal actions" for the Moab, Utah, Uranium Mill Tailings Remedial Action Project Site. The announcement of the release was made in the Federal Register on December 3, 2004.

Ignoring the facts presented by the Ute Mountain Ute Tribe, tribal members and other members of the public documenting the devastating impact that disposal of the Moab tailings and waste would have if disposed of at the IUC mill, the DOE has violated environmental justice, trust responsibility and sacred site protection mandates by continuing to consider the IUC White Mesa facility as a "reasonable alternative." There is nothing reasonable about dumping radioactive tailings and toxic waste on top of ancient, profoundly sacred sites including burials and ceremonial sites. It is environmental racism and a violation of federal trust responsibility.

Response:

It is required under NEPA that DOE document environmental impacts associated with all reasonable alternatives in the EIS. DOE has not ignored the facts presented by the Ute Mountain Ute Tribe, tribal members, and other members of the public. The EIS sections addressing cultural resources and environmental justice provide clear and explicit documentation that the White Mesa Mill alternative would have significant negative impacts on cultural resources and disproportionately high and adverse impacts to the White Mesa Ute community. This documentation will help to ensure that DOE's final decision-making is fully informed. Also, see responses to comments #5 and #9.

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Document #45 Comment #12 Commentor: Whiskers, Thelma

The tribal members have serious and well-founded concerns that the waste from Moab could harm the health of the tribal members. The Ute Mountain Ute Tribe officially, and strongly, opposes the 85-mile slurry line and has demanded repeatedly that the DOE take White Mesa off the list of options for the disposal of the Atlas tailings. However, despite the Utes' concerns and pleas, and despite the fact that white communities who faced much less risk have been eliminated from consideration, the DOE is continuing its examination of the feasibility of the White Mesa proposal.

By continuing to consider the IUC facility at White Mesa as a recipient of the radioactive and toxic materials from the Moab project and ignoring the extremely serious disproportionate religious, spiritual, cultural, health and environmental threats posed by the project to the White Mesa Ute Community, the DOE violates Executive Orders 12898, 13007 and 13175 and the Protection and Preservation of Traditional Religions of Native Americans Act, 42 U.S.C.A. §1996. If the IUC facility is approved as the recipient of the tailings and waste from the Moab project, the White Mesa Ute Community would bear a disproportionate share of the nation's environmental dangers. The proposal has a severe negative impact on the White Mesa Ute Community's religious freedom, severely threatens their cultural and traditional practices, desecrates their scared sites and threatens their health and environment. This discriminatory impact cannot continue to be ignored by the DOE.

Response:

See responses to comments #5, #9, and #11.
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Document #45 Comment #13 Commentor: Whiskers, Thelma

Executive Order 12898 requires federal agencies to take environmental justice concerns into consideration in the decision making process. Specifically, Executive Order 12898 states that "...each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations in the United States and its territories and possessions."

Section 1-103 states that each Federal agency shall promote enforcement of all health and environmental statutes in areas with minority populations. Further, Section 2-2 maintains that a Federal agency shall not subject persons to discrimination under its programs, policies and activities, because of their race, color or national origin.

The DOE, as a Federal agency, must therefore consider and avoid any discriminatory effects of the IUC proposal for the White Mesa Ute Community. The Ute Mountain Ute Tribe is a federally recognized tribe, and as such, must be taken into consideration as a community of color. The DOE must not place a disproportionate environmental burden on this community.

The DOE violates this executive order in at least three ways. First, they have not taken into consideration the cultural, spiritual, religious and traditional aspects of the Ute Mountain Ute Tribe. The disposal of radioactive and toxic materials from the Atlas site in Moab at the IUC White Mesa Uranium Mill will destroy and desecrate profoundly sacred and culturally significant sites at and next to the IUC facility, have a tremendous negative impact on the spiritual practices and spiritual well-being of tribal members, and further impede the traditional cultural practices of White Mesa tribal members Tribes' burial grounds. Due to the large volume of toxins that will be released into the air and water, the proposed tailings uranium mill will create adverse effects on the Tribes' subsistence hunting and gathering of traditional herbs, plants and medicines, essential to their survival as a people and culture.

Second, not only has the DOE failed to take the damage to the sacred sites into consideration, but it is also causing a disparate impact on a community of color based on race. The DOE has eliminated from consideration communities that are located farther away from their waste sites than the White Mesa community is from the White Mesa Uranium Mill. By withdrawing communities that are mainly white from consideration but continuing to consider a community of color as a potential site for its hazardous slurry line, the DOE directly violates the Executive Order. This forces a disproportionate environmental burden on a community of color. The proposed pipeline to the White Mesa Uranium Mill will be in addition to the operations of the White Mesa Uranium Mill. The additional waste will place a disproportionate burden upon the White Mesa community.

Third, the DOE fails to identify adverse human effects on a community of color because the DOE failed to even place the White Mesa Ute Community on maps of the area. Beyond failing to seriously consider issues of environmental justice, the DOE has engaged in a dangerous step. It is continuing the trend of eradication of Indigenous tribes by masking their existence, considering issuing a permit to allow more radioactive and toxic waste to be placed in tailings ponds near the

Document #45 Comment #13 - continued

community and directly on top of their sacred sites, all the while not informing the general public of the existence of the White Mesa Ute Community. As a result, the White Mesa Ute Community and the Ute Mountain Ute Tribe could be exposed to radioactive and hazardous wastes in their air, suffer the poisoning of their groundwater supply, suffer the desecration of sacred sites and severe harm to their spiritual well-being.

Response:

DOE has complied fully with both the letter and the spirit of Executive Order 12898. See responses to comments #8 and #11.
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Document #45 Comment #14 Commentor: Whiskers, Thelma

Executive Order 13007 provides for the protection of Indian Sacred Sites. The Executive Order provides that, "in managing Federal lands, each executive branch agency with statutory or administrative responsibility for the management of Federal lands shall accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites."

Under this Executive Order, the DOE maintains the responsibility for preserving the integrity of sacred Indian sites. In constructing the proposed slurry line, numerous archaeological and culturally significant sites could be destroyed, and many sacred sites at White Mesa would be desecrated and destroyed for expansion of the IUC facility to accommodate the tailings and waste from the Moab project. This is in addition to the numerous sacred sites that were destroyed when the Uranium Mill was originally constructed, as well as the ongoing, continuous desecration of and disturbance to sacred sites at White Mesa as a result of the ongoing activities at the facility. It is the duty and lawful responsibility of the DOE to remove White Mesa as a potential site for the disposal of the Moab project tailings and waste in order to prevent the further desecration of these sacred burial sites and other significant cultural sites. Any action to the contrary will be in direct violation of this Executive Order.

Response:

NEPA requires that DOE consider all reasonable alternatives in the EIS. Also, see response to comment #6.
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Document #45 Comment #15 Commentor: Whiskers, Thelma

The President issued Executive Order 13175 "in order to establish regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications." It is the duty of the DOE to work in meaningful consultation with Tribal officials. Section 5 of the Executive Order provides, "each agency shall have an accountable process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications."

As stated earlier, the Ute Tribal Council strongly opposes the construction of this pipeline. Ute Mountain Ute tribal leaders and representatives have met repeatedly with the DOE to discuss, and oppose, the IUC proposal. The Ute Mountain Ute Tribe and tribal members believe that the IUC plan poses significant risks to its White Mesa residents and sacred sites. As eloquently stated by a council member, "Which part of 'no' don't you understand?"

The DOE has completely disregarded the concerns of the Ute Mountain Ute Tribe and thus violates both the letter and the spirit of the Executive Order. The Order specifically calls for "meaningful" consultation and collaboration. By continually ignoring the concerns and wishes of the Tribe, the DOE fails to engage in any kind of collaboration, let alone meaningful consultation and collaboration.

Response:

See responses to comments #8, #9, #10, and #11.
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Document #45 Comment #16 Commentor: Whiskers, Thelma

In addition to violating the Executive Orders, the DOE violates 42 U.S.C.A. §1996 which provides that the United States shall preserve for American Indians their inherent right of freedom to believe, express and exercise their traditional religion.

As stated above, the disposal of the Moab project material at the IUC White Mesa facility will result in the destruction of previously undisturbed sacred sites. Tribal officials and White Mesa Ute Community tribal members have repeatedly told the DOE of the sacred spiritual and cultural significance of these sites. The DOE is well aware of the archaeological studies done for the federal government at the White Mesa Archaeological District that confirm the significance of the ancient sites there, including the presence of many burials and ceremonial kivas.

The area is sacred to both the Utes and the nearby Navajo people. Archaeologists have documented the presence of large pit houses and ceremonial kivas, storage structures, burial sites, fire pits, middens, and numerous artifacts of daily life. In 1979 and 1980, the Nuclear Regulatory Commission (NRC) and the Bureau of Land Management (BLM) designated this area a potential archaeological district and recommended it for inclusion in the National Register of Historic Places. The Keeper of the National Register determined that the uranium mill lands at White Mesa were eligible for the National Register as an archeological district.

The preservation of these sites is necessary for the preservation of the spiritual well-being of the White Mesa Ute Community. Tribal members have repeatedly made clear the profound respect that community members have for their ancestors, and the importance of preserving the integrity of the sacred sites including burial sites of their ancestors. These sites are also an important part of the Community's ability to worship, as they are used for many traditional gatherings. Destroying these sites will directly interfere with the tribes' freedom to exercise their traditional religion.

Response:

See responses to comments #6 and #9.
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Document #45 Comment #17 Commentor: Whiskers, Thelma

The White Mesa Concerned Community, comprised of members of the Ute Mountain Ute Tribe, request the following remedies:

(1) The Department of Energy must immediately uphold and comply with all applicable Executive Orders and laws and remove the International Uranium Corporation White Mesa Uranium Mill from consideration as a possible site for the disposal of the Atlas Uranium Mill tailings and associated wastes;

(2) The Department of Energy must exclude the IUC facility from consideration for receipt of any other tailings or waste material from any other source;

(3) The Department of Energy should educate all staff and contractors about Executive Orders and laws protecting sacred sites, religious freedom and practices, and environmental justice.

Response:

DOE strongly contends that it has upheld and complied with executive orders and legislation regarding protection of cultural resources and sacred sites, consultation with tribal entities, and environmental justice. Also, see response to comment #9.
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Document #45 Comment #18 Commentor: Whiskers, Thelma

The Department of Energy, as a federal agency, is mandated to uphold the law and abide by Executive Orders. The Department of Energy must not take actions that have a discriminatory or disproportionate impact on people of color or other low-income populations. It must protect sacred sites and not interfere with traditional religious freedoms and practices. The Department of Energy's actions and decisions to date regarding shipping material from the Atlas Uranium Mill to the IUC facility have not complied with the laws and Executive Orders cited in this complaint. The result is a direct violation of the civil rights of members of the White Mesa Ute Community of the Ute Mountain Ute Tribe.

Our civil rights, sacred sites and religious, cultural and traditional practices must be respected, by law and by right.

Response:

See responses to comments #9 and #17.
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Document #47 Comment #1 Commentor: Dohrenwend, John C.

After all of the studies, reports and pronouncements by the Atlas Minerals Corporation, the Nuclear Regulatory Commission, the Department of Energy and their advisors and consultants, what do we really know about the suitability of the Atlas mill site for long term storage of more than 10.5 million tons of hazardous waste? Well for one thing careful review and analysis of the Department of Energy's reports clearly show that the DOE has not developed an accurate picture of the geologic and hydrologic conditions at the mill site. The DOE's reports contain numerous flaws and failings, including the use of inaccurate and/or incomplete data, errors in logic, errors in data analysis and comparison, selective and/or inconsistent use of data, errors of omission, and the application of overly simplistic models and theories that are largely inappropriate to the specific geologic and hydrologic situation in Moab Valley. As a result, DOE's assessment of the potential hydrologic and geologic hazards at the Moab Mill site is overly simplistic and highly distorted.

Response:

A detailed response cannot be provided because the commentor does not provide specific examples where he believes the Department's positions are flawed, inaccurate, or incomplete. The Department's positions are based largely on the technical information reported in the SOWP (DOE 2003a) and supporting calculation sets. DOE believes the technical data are accurate and complete and that they demonstrate a level of quality and understanding of hydrogeologic and geologic conditions more than sufficient for the purposes of supporting the EIS and DOE's decision-making processes. A systematic evaluation of geologic processes that could affect the site is detailed in Sections 4.1.1.1, 4.1.3, and 4.1.17 of the EIS. Uncertainties related to disposal cell or tailings pile failure are addressed in Tables S−1 and 2−33.
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Document #47 Comment #2 Commentor: Dohrenwend, John C.

Contrary to the DOE's assurances:

(1) An 80-year history documented by historic maps and aerial photographs clearly shows that the Colorado River is not migrating south and east away from the tailings pile. The high flood levees bordering the main channel have not shifted measurably, while the south and east bank of the active channel between these levees has moved north and is now 150 to 320 feet closer to the mill site. As a result the channel has also narrowed and deepened in its new position.

Response:

DOE's analyses support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. Differing opinions on this conclusion are discussed in Section 2.6.4. To mitigate potential river migration under the on-site disposal alternative, DOE would install a barrier wall (shown in Figure 2−3 and discussed in Section 2.1.1.1). Further, in Section 2.6, DOE acknowledged the uncertainties regarding this issue and its effect on long-term performance.
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Document #47 Comment #3 Commentor: Dohrenwend, John C.

(2) Available subsurface data indicates that the valley fill is thickest and deepest beneath or slightly north of the present location of the river channel, that subsurface conditions directly beneath the tailings pile are much more complex than the highly simplistic picture presented by the DOE, and that differential subsidence of the valley floor directly beneath the tailings pile must be considered as a potential geologic hazard.

Response:

Geologic hazards are discussed in Section 3.1.1.4 of the EIS. Geologic processes that could affect the site are evaluated in detail in Sections 4.1.1.1, 4.1.3, and 4.1.17. Uncertainties related to disposal cell or tailings pile failure are addressed in Tables S−1 and 2−33.
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Document #47 Comment #4 Commentor: Dohrenwend, John C.

(3) The position of 'The Sloughs' in the Matheson Wetlands is a lowland marking the boundary between the Mill Creek Pack Creek fan and the Colorado River fan. The Sloughs are not directly related to salt induced subsidence of the valley filling sediments.

Response:

DOE's analyses support a conclusion that the Moab Slough is caused by salt-induced subsidence, as evidenced by the deep basin fill deposition overlying the Paradox Formation. This position is supported by Harden et al. (1985), who also report that marshes present along the Colorado River may indicate ongoing subsidence.
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Document #47 Comment #5 Commentor: Dohrenwend, John C.

(4) Courthouse Wash and Moab Wash have not caused the Colorado River channel to migrate away from the mill site. Rather, analysis and direct observation of high energy flows from Courthouse Wash clearly show that these floods have deposited sediments on the south side of the channel and therefore have actively contributed to the northward migration of the Colorado River.

Response:

DOE's analyses in the EIS support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. Differing opinions on this conclusion are discussed in Section 2.6.4. To mitigate potential river migration under the on-site disposal alternative, DOE would install a barrier wall (shown in Figure 2−3 and discussed in Section 2.1.1.1). Further, in Section 2.6, DOE has acknowledged the uncertainties regarding this issue and its effect on long-term performance.
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Document #47 Comment #6 Commentor: Dohrenwend, John C.

(5) The geometry and position of ancient Colorado River gravels buried beneath the surface of Moab Valley clearly show that in the recent geologic past the Colorado River has in fact shifted back and forth across mill and tailings site.

Response:

See response to comment #5.
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Document #47 Comment #7 Commentor: Dohrenwend, John C.

Therefore, careful and consistent analysis of available data shows that the flood hazard potential at the Moab Mill site is not diminishing because of a fantasized southward and eastward migration of the Colorado River. Rather, the River has flowed across the site in the past and very possibly could return to that course in the future. Also because the River's inner channel has over the past 80 years shifted closer to the pile and has become narrower and deeper, the potential for deep channel scour and sudden channel shifting may have increased significantly.

Response:

DOE agrees with the commentor that at some point in the future, especially considering geologic time, the river will cross the Moab site. As part of the EIS analysis for the on-site disposal alternative, the need for engineered barriers to mitigate river migration is defined.
==

Document #57 Comment #1 Commentor: Webb, Chris—City of Blanding, City Manager

- To leave the tailings capped in place does not eliminate the potential damage to the river or surrounding property.

Response:

The EIS identifies the on-site disposal alternative as being a reasonable alternative, which would be able to meet the protective criteria promulgated in 40 CFR 192. Based on the analyses in the EIS, no significant impact on the river or surrounding property should result from the implementation of this alternative during the regulatory time frame of 200 to 1,000 years. The EIS acknowledges that there may be significant impacts beyond this period. Additionally, in Section 2.6.3 of the EIS, the Department presents the uncertainties associated with the analysis of this alternative, and a new section (Section 2.6.4) presents responsible opposing views to support informed decision-making.
==

Document #57 Comment #2 Commentor: Webb, Chris

- Nor does it stop the river from continuing its move toward the contaminated pile.

Response:

DOE's analyses support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. Differing opinions on this conclusion are discussed further in Section 2.6.4 of the EIS. To mitigate potential river migration under the on-site disposal alternative, DOE would include a barrier wall (identified in Figure 2−3 and discussed in Section 2.1.1.1 of the EIS). Further, DOE has acknowledged the uncertainties regarding this issue and its effect on long-term performance in Section 2.6.3 of the EIS.
==

Document #57 Comment #3 Commentor: Webb, Chris

- It appears that leaving it in place would only be a temporary solution with little to no investment return trade off.

Response:

The EIS identifies the on-site disposal alternative as being a reasonable alternative that would be able to meet the protective criteria promulgated in 40 CFR 192 for at least the regulatory period of 200 to 1,000 years. The EIS acknowledges that there may be significant impacts beyond this period. The Department has also presented the uncertainties associated with this alternative to support informed decision-making.
==

Document #57 Comment #4 Commentor: Webb, Chris

- No alternative provides the same investment return that the slurry line option does, even if the IUC alternative is not the cheapest. Besides the economic impacts that benefit the community and the benefits of recycling and extracting the remaining minerals in the tailings will have, the project can tie directly into solving a culinary water shortage that has been plaguing San Juan County in consistent cycles, costing the federal government millions of dollars in drought mitigation over the years.

Response:

As described in Section 1.4.5 of the EIS, the potential post-remediation use of a slurry pipeline to White Mesa Mill is beyond the scope of this EIS, and the economic value of further processing the tailings was dismissed by IUC as not cost-effective.
==

Document #57 Comment #5 Commentor: Webb, Chris

- Why are we proposing to create a new site when the IUC site is in place. This makes no sense.

Response:

The EIS, as required by NEPA, considers all reasonable alternatives, and DOE has determined that other off-site disposal alternatives are reasonable. Further, the decision-making process must consider the environmental impacts of these alternatives along with other criteria such as cost. In the case of the White Mesa Mill site, co-locating uranium mill tailings from Moab with the existing tailings at IUC's White Mesa Mill would afford some benefit in the form of waste consolidation and nonproliferation of waste sites.
==

Document #57 Comment #6 Commentor: Webb, Chris

- We were not only shocked but dismayed at the lack of understanding regarding the issues of public safety. Emotions are high and misunderstanding too numerous to number.

Response:

Concern for public and worker safety is foremost in DOE's ongoing management of the site and is paramount in its decision-making. The analyses provided in the EIS (Sections 4.1.15, 4.2.15, 4.3.15, and 4.4.15) consider both public and worker safety.
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Document #57 Comment #7 Commentor: Webb, Chris

- We have full confidence that the DOE has the ability to provide the necessary regulatory standards to ensure public safety and environmental compliance.

Response:

DOE appreciates the vote of confidence.
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Document #57 Comment #8 Commentor: Webb, Chris

- Our education from Utah's Department of Environmental Quality gives us added confidence that the process can be handled safe both publicly and environmentally and that the associated risks are minimal if not non-existent.

Response:

Section 4.4 of the EIS addresses the environmental consequences and risks associated with the White Mesa Mill alternative. Additionally, as the regulatory authority over the operations at the White Mesa Mill, the State of Utah would be an active participant in this alternative.
==

Document #57 Comment #9 Commentor: Webb, Chris

- We encourage a full education program regarding the associated risks so that the public can come to the same conclusions.

Response:

The EIS has been prepared as a public information document as well as an important input to DOE's decision-making process. It is DOE's policy to communicate the issues using clear and understandable language to explain technically complex analyses. Appendix D provides an overview to the risks from exposure to radiation and cites several references where the interested reader may find even more information.
==

Document #58 Comment #1 Commentor: Christie, Richard Lance

Summary: Recent robust work by the U. S. Geological Survey, State of Utah Department of Environmental Quality, and the University of Utah Department of Geology and Geophysics indicates that a number of the site characterization assumptions made in the DEIS are highly questionable. The 1000-year stability of an in-situ reclamation is far more uncertain than claimed in the DEIS. It is possible that an observer 1,000 years from now would be unable to differentiate the environmental impacts of the No Action and Capping-In-Place alternatives because of containment failure due to site instability.

Response:

DOE disagrees with the commentor that the recent USGS report questions the assumptions and analyses of the EIS. DOE has added Section 2.6.4, Responsible Opposing Views, to the EIS to clarify and explain all positions on this issue. DOE and its predecessors have expended considerable time and public funds in studying the site suitability at all disposal sites considered in the EIS. DOE acknowledges uncertainties in Section 2.6.3 of the EIS. In addition, there are considerable differences between the on-site disposal alternative and the No Action alternative; these differences are summarized in Table 2−32 of the EIS.
==

Document #58 Comment #2 Commentor: Christie, Richard Lance

It would be foolish false economy to spend $166 million on a capping-in-situ reclamation which has a substantial probability of failing. The difference between the DEIS's estimated costs of capping in-situ and moving the tailings to an alternative location ($329−464 million) would quickly disappear in the cost of a failed remediation: damages from toxic release and costs of addressing a cleanup and second remediation effort.

Response:

The commentor assumes that on-site disposal would result in a substantial probablilty of failure. DOE does not concur with this assumption. As discussed in Sections 2.6.4 and 4.1.17 of the FEIS, this failur scenario was analyzed to support decision-making among alternative, it does not support an assessment of post-failure remediation costs. Costs for a failed reemdiation effort for on-site disposal are to speculative to quantify.
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Document #58 Comment #3 Commentor: Christie, Richard Lance

We locals are cognizant of the fact that the neighboring Green River tailings were remediated twice and the Monticello tailings were remediated three times under the DOE Title I program. Like the Atlas tailings, the Green River and Monticello tailings were unlined and located on a porous basement structure in a drainage of the Colorado River basin. Both were initially capped in place; both were moved to a lined alternative location away from a drainage for their final remediation when previous efforts did not reduce leachate discharge to acceptable levels.

Response:

Monticello was remediated under CERCLA, and Green River was remediated under Title I of UMTRCA. Neither site was initially capped in place, although vicinity properties were temporarily stored at Monticello. The final cell locations were not based on acceptable concentrations of leachates, but rather on studies and remedial action plans that considered impacts to human health and environment in the long term.

In the Moab EIS, cell performance and impacts for all the alternative disposal locations have been quantified. The final design will be completed after DOE issues a Record of Decision. The design will be documented in a remedial action plan and must be approved by the NRC.
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Document #58 Comment #4   Commentor: Christie, Richard Lance

We think that the assumptions about the difference in groundwater remediation effort duration and costs if the tailings are left in place or if they are removed in the DEIS are incorrect. Oak Ridge Hydrological Laboratory opinion suggests that groundwater remediation with the tailings in place will have to continue far more than 80 years, while remediation efforts under tailings removal alternatives taking 8 years may require less than the 75 years stated in the DEIS. Although design and construction of the groundwater remediation system would be the same $10.75 million, at $906,000 operating cost per annum the cost of groundwater remediation might be considerably cheaper under the tailings removal alternatives and offset the higher cost of relocating the tailings for reclamation.

Response:

DOE agrees that there are numerous uncertainties and assumptions, including long-term ones that could potentially increase the duration of remedial action under the on-site disposal alternative and could therefore increase the lifetime cost of the on-site disposal alternative. In the EIS, DOE has described each recognized area of uncertainty and the potential consequences, including cost, where applicable (see EIS Tables S−1 and 2−33). In addition, in the final EIS DOE has added a new section (Section 2.6.4) that addresses specific areas of uncertainty about which there are responsible opposing views. In some instances it is not possible to quantify the potential impacts of areas of uncertainty on cost estimates. One area of uncertainty frequently cited as potentially affecting the cost of the on-site disposal alternative is the applicable compliance standard for surface water ammonia and, by extension, how long ground water would have to be treated to achieve protective concentrations in surface water. Details and assumptions used in the flow and transport modeling are presented in Section 7 of the SOWP. DOE is confident that the assumptions used to predict the remediation time frames and costs are reasonable and sufficient for evaluation of alternatives in the EIS. However, DOE also acknowledges that there are uncertainties related to the remediation time frames, costs, and other factors, which are addressed in Tables S−1 and 2−33, item #1.
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Document #58 Comment #5 Commentor: Christie, Richard Lance

As detailed below, we have issues with several of the statements made in the DEIS about the alternative reclamation sites. In aggregate, we think the characteristics and contingies of use of the current tailings site and White Mesa Mill alternative site for remediation are worse, and the characteristics of the Klondike Flats and Crescent Junction sites are better, than the DEIS evaluation indicates.

Response:

DOE believes its characterization of the alternatives in the EIS is accurate and sufficient to support decision-making.
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Document #58 Comment #6 Commentor: Christie, Richard Lance

If one takes both environmental cost benefit and the degree of certainty of 1,000-year reclamation stability into account, the best alternative is moving the tailings to the Klondike Flats site by truck; second is moving the tailings to Crescent Junction by rail; third is rail transport to Klondike Flats; fourth is moving the tailings to Crescent Junction by truck; a distant fifth is moving the tailings to the White Mesa Mill by slurry line. Moving the tailings to White Mesa by truck and capping the tailings in place have such large costs and/or risks that we do not consider them acceptable by comparison to these five acceptable alternatives. In a worst case scenario the reclamation in situ alternative calculates as infinitely less cost-effective than the No Action alternative and should be dropped from consideration.

Response:

DOE will consider the analyses provided in the EIS, comments, uncertainties, costs, and other factors in making its final decision.
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Document #58 Comment #7 Commentor: Christie, Richard Lance

1. River Migration: The DOE's river migration report (a 19-page letter entitled "Migration Potential of the Colorado River Channel Adjacent to the Moab Project Site") suggests that the valley is subsiding more rapidly on the south side of the Colorado River, which would cause the river to migrate southeastward away from the tailings. There are three reasons to disbelieve this report:

1.A. Dr. John Dohrenwend discovered that the comparison of reported positions of the river channel by the DOE from 1944 to date were based on mis-registered overlays of aerial photographs. When historic maps and photographs are accurately registered, it is obvious that since 1924 the south bank of the Colorado has moved progressively north, west, and southwest away from Moab and towards the tailings site. From the U.S. 191 bridge to the tailings site, the south bank has moved north and northwest an average of 320 feet since 1944. Downstream from the tailings, the south bank has moved west and southwest an average of 175 feet. Neal Swisher has suggested some of these changes resulted from diking done by C & W Construction to divert water to the Atlas Mill pump intakes on the north side of the island from the channel on its south. This diking does not explain river bank migration from 1924 to the mid 1960's, which was in the same direction as that from the mid 1960's when diking was done to date.

1.B. At the January Atlas stakeholders meeting, the USGS presented new, robust data on past river migration to the north of its current bed. The USGS data analysis is far more robust and current than that in the 19-page DOE report. The USGS scientists believe the data shows the river will migrate north, not south, in the future.

1.C. It appears that the fluid dynamics model used by the DOE migration report did not take into account the sediment load in the Colorado River. The capacity of surface water to carry suspended solids is the square of the water's velocity. Water flows faster at the outside of a river curve than at its inside radius. The south bank of the Colorado is on the inside radius of the river's curve opposite the tailings; the river turns from northwest to south almost 90 degrees from the US 191 river bridge to the Portal. The slower current near the south bank will cause greater deposition of silt there than on the north side. This deposition makes the channel shallower, creating friction which lowers water velocity. Because of the curve of the Colorado River in its crossing of the head of Spanish Valley, a collapsed salt diapir, it will force itself from the south towards the north because of the fluid dynamics of heavily silted water.

Response:

There are responsible opposing views regarding river migration. The EIS has been expanded to present a summary of these opposing views and DOE's evaluation (Section 2.6.4). DOE has considered Dr. Dohrenwend's detailed comments, which are presented as Document #429 in Chapter 3 of the Comment Response Volume III of the FEIS. If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration toward the pile begin to occur unexpectedly. The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials

Document #58 Comment #7 - response continued

would be sized to exceed the maximum river forces recently identified by USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment. The final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan if the on-site alternative were selected. The estimated cost range for remediation (shown in Table 2−33, item #9) would accommodate materials consistent with the recent USGS report.

Section 4.1.17 of the EIS addresses a failure of the disposal cell at the Moab site and the expected consequences and potential risks. These would include impacts to downstream users, aquatic receptors, backwaters, terrestrial biota, and adjacent areas. The focus of the analysis is to evaluate the potential consequences of contaminants in the water and sediments of the Colorado River based on a significant (catastrophic) release of tailings. Although the probability of a significant release would be very small over the design life of the on-site disposal cell, this type of failure was assumed to occur in order to evaluate the potential consequences (risks).

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Document #58 Comment #8 Commentor: Christie, Richard Lance

2. Catastrophic flooding: The DOE's geohydrological model for the site assumes the presence of a rock sill underneath the Colorado River at the Portal. In a 300,000 cfs 500-year flood event, the hypothetical rock sides and bottom of the Portal would act as a weir, damming the flow and creating a lake which would rise up around the lower part of the tailings but pose no erosional challenge to the cap because the water would be flowing at very low velocity. This model appears to be wrong because it is based on questionable assumptions.

The State of Utah drilled 150-foot deep cores along the south bank of the Colorado opposite the tailings pile. Kip Solomon and Phil Gardner of the University of Utah report that there is 15-18 feet of silty riverine alluvial deposits on the top. Below these, as deep as was drilled, there is 135 feet of flood scour coarse gravels with no silty lenses or even smaller gravels: rocks from the size of a thumb up to the size of a human head are typical. Pieces of driftwood buried in this scour gravel were carbon dated. At a depth of 24 feet, carboniferous materials dated at less than 100 years old. At 35 feet depth, the carboniferous material dated as 900 years old. The presence of uniform scour gravels to a depth of 150 feet indicates high velocity river flow during flood events; exactly the opposite of the DOE's thesis that a stillwater lake would form during floods due to a choke of river flow at the Portal.

If a theory predicts the opposite of what is in fact observed when measurements are taken, the scientific method requires it be discarded. The weight of the evidence is that the Colorado River was scouring 35 feet deeper than the river bed today within the last 1,000 years, and that it is migrating northwards towards the tailings pile. This introduces the substantial possibility that the river would scour in a flood event, cutting northward and undermining the armor of the toe of the tailings impoundment, causing partial collapse of the cap and release of tailings, within the next 1,000 years.

In combination, we believe the river migration uncertainty and catastrophic flood uncertainties introduced by this new data disqualify the current tailings site as a feasible site for a disposal cell meeting regulatory requirements.

Response:

See response to comment #7.
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Document #58 Comment #9 Commentor: Christie, Richard Lance

The DEIS posits $10.75 million for design and construction of the groundwater remediation infrastructure and $906,000 annually to operate it (S−9). Meeting the DOE target ground water remediation goal of 3 mg/L of ammonia in ground water would require 80 years under the on-site disposal alternative and for 75 years under any off site disposal alternative (S−13). Since on-site remediation is estimated to take 7−10 years (S−8) and off-site disposal to take 8 years (S−9), the DOE must be assuming that the same lack of infiltration of new leachate into groundwater will occur at the point the tailings are capped in situ as would occur when they are completely removed from the site. This assumption has been present in past NRC and Atlas documents concerning the effect of capping the tailings in situ.

Response:

The commentor is correct in summarizing DOE's assumption that the infiltration rate would be greatly reduced from current levels if a new cover were placed on the tailings pile, as is proposed under the on-site disposal alternative. This would limit, but not eliminate, the amount of leachate reaching the ground water. Details and assumptions used in the flow and transport modeling are presented in Section 7 of the SOWP.

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Document #58 Comment #10 Commentor: Christie, Richard Lance

The Oak Ridge Hydrological Laboratory examined the leachate plume from the Atlas uranium tailings in 1997 at the request of the U.S. Fish and Wildlife Service and paid for by the Council on Environmental Quality. The NRC paid the Oak Ridge scientists to model the effects of the capping on discharge from the pile into the leachate plume. The report, "Tailings Pile Seepage Model: The Atlas Corporation Moab Mill, Moab, Utah" dated January 9, 1998, concluded that capping the pile would have no effect whatever on the discharge rate of leachate into the indefinite future. The reason was that the recharge rate of rainwater into the tailings through the clay cap would match the rate of infiltration of water through the upper tailings. In the words of the report, the "unsaturated hydrologic conductivity" of the fine tailings at the top of the pile are "sufficient to conduct the total volume of recharge through the pile." The laboratory found the moisture content of the tailings is 0.63 at the top of the pile, 0.75 at the bottom, and 0.71 overall. If moisture content was lowered to 0.57, there would still be 426 million drainable gallons of water in the tailings. Oak Ridge additionally found that the embodied water in the tailings was very tightly bound in the fine (-100 grit) tailings, or "slimes," was unlikely to enjoy significant recovery by the dewatering wells or "wicking," instead discharging for 270 years even if the top of the tailings pile was hermetically sealed so no additional water infiltrated. Finally, Oak Ridge flatly stated in the report that the capped pile would continue to violate groundwater standards with its leachate indefinitely - meaning for longer than the 1,000-year regulatory framework.

The DEIS does not address or refute these findings by the Oak Ridge hydrologists who did the groundwater hydrology work on the 24 DOE Title I uranium tailings reclamations and are arguably the standing experts on the subject. Absent substantial refutation based on sound new information, we conclude the estimate of 75 years for groundwater remediation if the tailings are removed is probably accurate, but an accurate estimate for how long groundwater remediation would have to continue at the site if the tailings were present is more on the order of 270 years (S−37 "more than 200") than 80 years. (This assumes alternative concentration limits would be employed; the DEIS analysis assumes the leachate would violate standard concentration limits for more than the 1,000-year regulatory framework.)

Response:

The 80 years that DOE estimates for the on-site disposal alternative is the time period that would be required for ground water concentrations near the riverbank to reach a cleanup goal of 3 mg/L ammonia. The target goal of 3 mg/L for ammonia in ground water provides a reasonable assurance of meeting the surface water remediation objective to provide protection to aquatic species. As stated in the EIS (Section 4.1.3.1, Construction and Operations Impacts at the Moab Site), it is expected to take 200 years for the ammonia concentrations to reach levels less than 0.7 mg/L at steady state.

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Document #58 Comment #11 Commentor: Christie, Richard Lance

We also note that the State of Utah and Oak Ridge found that levels of molybdenum are very high (1000-2000 micrograms/liter range); selenium is high (95.3 ug/L) close to the pile - moving slowly in the alkaline environment; sulfate is present in concentrations exceeding 12,000 mg/L in the plume; and uranium, largely as uranyl carbonate ion was 2.68 and 6.76 mg/L in two test wells, and Oak Ridge stated that a level of 2.8 mg/L of uranium would persist in groundwater downgradient of the tailings "indefinitely." G.K. Eddlemon of Oak Ridge reported that "...both water quality data and measured redionuclide concentrations in fish indicated substantial enrichment in certain redionucides originating in the tailings pile [Polonium-210, Thorium-230, and Uranium-238; Po-210 was responsible for 80%]". There is no mention of these other contaminants as being of any significance biologically or otherwise. This is an important omission if we are considering the biological risk of cumulative impacts of continued tailings pile leaching over 270 years.

Response:

These chemical and radioactive contaminants were evaluated in Appendix A2 of the EIS. The evaluation considered the concentrations in comparison to aquatic and terrestrial benchmarks for chemicals and radionuclides. A summary of the evaluation was included in Chapter 3.0 of the EIS and in the Biological Assessment (Appendix A1), which is part of the consultation with USF&WS and its biological opinion of impacts to endangered species. These chemical and radioactive contaminants are known to be entering the Colorado River environment. The action alternatives include active ground water remediation to address these contaminants entering the river. They also include a target goal for when remediation would be considered complete and the ground water entering the river would no longer pose a risk to the biological community.
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Document #58 Comment #12 Commentor: Christie, Richard Lance

Finally, we note (S−45) uncertainty number 18, acknowledging there is probably an ammonia salt layer in the tailings. (The lower part of the tailings is the residuum of the Mi Vida pitchblende ores reduced by an alkaline process, the upper part is the residuum of Vanadium-type ores reduced by an acid process, making the Atlas tailings chemistry uniquely complex.) The DEIS assumes that this salt layer would be dissolved and reach groundwater no sooner than 1,100 years, which is beyond the regulatory life span of the disposal cell. This time scale is also based on the assumption that the cap will stop rainwater infiltration, while Oak Ridge found the cap will not do so. If Oak Ridge is right, this ammonia salt layer could reach groundwater within the regulatory life span of the disposal cell. This event would fail to meet regulatory requirements for reclamation.

Response:

The EIS acknowledges the possible existence of an ammonia salt layer in the upper 10 feet of the tailings pile and acknowledges that if this layer does exist, a second pulse of ammonia contamination may leach from the pile at some point beyond the regulatory period of 200 to 1,000 years if the pile were left in place (Section 4.1.3). Based on modeling, DOE estimated that the leaching effects of an ammonia salt layer would not be observed at the underlying water table for 1,000+ years and, in the absence of any remediation, could continue for about 440 years. DOE did not simulate this effect with the contaminant flow and transport model or estimate costs because the existence of the salt layer has not yet been confirmed and also because the regulatory time period for the design of the cell is 200 to 1,000 years (40 CFR 192). Furthermore, as discussed in Section 6 of the SOWP, attenuation processes (for example, biological degradation and sorption) make it likely that ammonia concentrations in the tailings fluid near the base of the pile would be considerably less.

Uncertainties related to the potential salt layer are addressed in item #18 of Tables S−1 and 2−33. If the on-site disposal alternative were selected, DOE would implement more detailed field studies to confirm or refute the existence of the salt layer. If the existence of the salt layer were confirmed, additional field studies would then be implemented to characterize and map the salt layer. Based on these characterizations, more reliable transport modeling would be undertaken and, based on the results, a decision would be made regarding the need for mitigation measures. If found to be necessary and appropriate, mitigation measures could include excavation and treatment of the salt layer, which could eliminate the concern over a secondary pulse of ammonia that might occur in the year 3100 time frame. However, given the still-unconfirmed nature of the data regarding the salt layer or its possible future impacts, DOE has not conducted additional characterization of the potential impacts and associated mitigation measures or evaluated costs beyond the material presented in the EIS, because DOE has determined that such information is not essential to a reasoned choice among the alternatives.

The commentor is correct that if the cover failed to meet the 1×10^{-8} cm/s infiltration rate, the regulatory requirements for the on-site disposal alternative would not be met. This scenario is described in the EIS (Section 4.6.3) under the No Action alternative. Based on technical literature (Howell and Shackelford 1997; Estronell and Daniel 1992) and experience with other cover designs (Albright et al. 2004), the Department has a reasonable assurance that a cover can be successfully constructed with saturated hydraulic conductivity values that meet the ground

Document #58 Comment #12 - response continued

water protection strategy requirements (1×10^{-8} cm/s). Further, it is explicitly contemplated in UMTRCA that long-term stewardship, including monitoring and maintenance of the institutional and engineering controls, would be applied to the site to ensure long-term performance and protection of public health and the environment.
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Document #58 Comment #13 Commentor: Christie, Richard Lance

This unusual chemical reduction circuit and feedstock history of the Atlas tailings also raises the uncertainty of the tailings characterization employed by the DOE (S−37). Tailings moisture content and driability, particle size distribution, and the concentrations of organic and inorganic contamination through the pile are likely to vary widely as a function of the ore being processed and the reduction circuits being used at the time a particular slurry of tailings was discharged into the tailings pile. Various former Atlas workers and suppliers report that the tailings impoundment was used for disposal of various hazardous wastes by local mining, construction, and drilling concerns as a courtesy by Atlas management. This variability in tailings pile content raises uncertainty and risk for both in-situ reclamation and any slurry line relocation alternative.

Response:

The commentor is correct that the contents of the tailings pile are not uniform. Section 3.1.3.1 describes millsite contamination, including nonradiological tailings pile contamination. Uncertainties in the nonradiological characteristics of the tailings pile and the possible consequences of these uncertainties are addressed in EIS Tables S−1 and 2−33, item #3. More detailed characterization of the material properties, such as moisture content, particle size, and milling debris, will be investigated and incorporated into the design after the Record of Decision, as shown in Figure 2−1 in the EIS.
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Document #58 Comment #14 Commentor: Christie, Richard Lance

1. Land Use: We believe the DEIS mis-characterizes the impacts of use of this 435-acre disposal cell site on grazing and cultural resources. The Klondike Flats site recommended by Grand County is a Mancos Shale badlands with a grade below the threshold for sheet erosion. Groundwater percolation rate measured by Geologist Bob Norman in the 1970's when evaluating the site for Potash evaporation pond use is 1/100th of an inch per year. His bores indicate the shale is about 900 feet thick. Static fossil groundwater underneath and in pockets in the shale is so saline and full of heavy metals that the tailings leachate has better water quality. Consequently there is almost no vegetation on the site. The few plants there are are highly salt-adapted and not palatable to either domestic livestock of wild game species. The area is therefore likely to lack any cultural sites because Native Americans had no more reason to go there to hunt than current citizens have to go there to hunt or graze livestock.

Response:

The EIS is consistent with the comment characterizing the poor quality of the Klondike Flats site for grazing; however, DOE disagrees that the EIS mischaracterizes impacts on grazing. Section 4.2.8.2 merely acknowledges that use of the site would impact an existing grazing allotment. The estimated cultural site density of 22.4 to 27.4 sites per square mile at the Klondike Flats site is based on the actual number of cultural sites found on adjacent lands on similar soils and landforms. DOE believes it has sufficiently characterized cultural resources at the Klondike Flats site to support decision-making. If an off-site location were selected, a Class III cultural survey would be performed to define the presence or absence of specific resources and determine mitigative actions, if needed.
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Document #58 Comment #15 Commentor: Christie, Richard Lance

2. Recreational conflict: The Blue Hills road which leaves US 191 south of Canyonlands Field is used somewhat as a recreational access, primarily to the Ten Mile Canyon area to the northwest. Most recreation use is along the Mill Canyon road just to the south of Courthouse Wash. Mountain bicyclists use numerous camping areas along the Wash and ride to the south and west into Courthouse, Mill, Tusher, and Bartlett Canyons, the Disappointment Towers area, and around the Sevenmile Rim recreation area. Thus, most recreational traffic and camping use in the area is a couple of miles south of the roadway to the Klondike Flats disposal cell site. There is some potential for recreational use conflict if the Blue Hills Road itself was used as a truck haul route; alternative access to the Ten Mile Canyon complex exists through the Dubinky Well road.

Response:

The Klondike Flats site is located in an area that BLM has determined is suitable for disposal of tailings under its resource management plan, which is consistent with the multiple-use concept under the Federal Land Policy Management Act of 1976. Section 3.2.9 of the EIS acknowledges the present and potential recreational use of the area.
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Document #58 Comment #16 Commentor: Christie, Richard Lance

3. Visual impact, latent cancer risk: The Klondike Flats site recommended by the county is, as the DEIS correctly states, the lowest in visual impact on the fewest viewers among the alternatives.

Response:

Yes, the Klondike Flats disposal alternative would have the least visual impact of all the alternatives.
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Document #58 Comment #17 Commentor: Christie, Richard Lance

We think that the stated latent cancer risk of 0.09 in 1000 years is high. We can see no reason that actual exposure of people to the tailings would be any greater than at the Crescent Junction site, which projects 0.07 latent cancer risk for a disposal cell there.

Response:

The difference in the long-term population risks between Klondike Flats and Crescent Junction results from the slightly higher population assumed to be exposed at Klondike Flats.
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Document #58 Comment #18 Commentor: Christie, Richard Lance

4. Borrow material demand: The Mancos Shale at the Klondike Flats meets disposal cell liner requirements if roller-compacted. Per 40 CFR 192 which specifies below-grade reclamation of tailings, the county has long proposed that the tailings be impounded at this site by excavating receiving cells in the shale, roller-compacting the bottom, filling the cell with tailings, then covering the tailings with the reserved excavated shale/clay, molding the thick cap to a grade below the threshold of sheet erosion. This reclamation design would not require any borrow material to be hauled into the site. With a cap below the grade for gully erosion, no rip-rap would be needed to stop such erosion. The roller-compacted Mancos Shale cap would have the same percolation characteristics as the proposed clay cap in the in situ reclamation alternative. Hauling in revegetation matrix soil from Floy Wash to this site to revegetate it would result in an incongrous patch of elevated vegetation in a sea of barren Mancos Shale badlands. There is no technical reason to keep the minimal amount of rainwater which would percolate through the flat cap out of the “bathtub” full of tailings which would have at least a .57 moisture content to begin with (per Oak Ridge).

Response:

DOE will consider all variables and technical aspects of the cell design in a remedial action plan following the Record of Decision.
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Document #58 Comment #19 Commentor: Christie, Richard Lance

1. Transportation to site: The Crescent Junction site would require a shorter rail spur to access from existing rail lines than the Klondike Flats site would. It is a longer haul by truck than Klondike Flats. The stakeholders group dismissed the idea of hauling by rail to Klondike Flats because the cost of loading and unloading facilities for rail haul were higher than the cost of loading, unloading, and transport by truck to that site. Once tailings are loaded on a rail car, the cost per mile for transport is very small relative to truck transport primarily because of differences in fuel, labor, and depreciation. No analysis was done to see if the cost of rail transport the further distance to Crescent Junction balanced out the greater cost of truck transport to this more distant site. The advantages of rail transport in terms of traffic safety, road depreciation, and pubic exposure are such that, if rail transport to Crescent Junction would cost about as much overall as truck transport to Crescent Junction, the virtues of the Crescent Junction disposal cell site and the advantages of rail transport would make rail relocation to Crescent Junction the preferred alternative.

Response:

DOE considered many factors, including those described by the commentor, in identifying transportation by rail to the Crescent Junction site as its preferred disposal alternative. DOE will consider these factors in its final decision-making.
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Document #58 Comment #20 Commentor: Christie, Richard Lance

2. Land Use: We believe the DEIS exaggerates the impact of use of this 435-acre disposal cell site on grazing but is probably correct concerning cultural resources. The Mancos Shale badlands at Crescent Junction have an overlay of erosional outwash from the Book Cliffs and therefore supports more vegetation than the Klondike Flats badlands. Groundwater percolation rate of the deeper shale is probably 1/100th of an inch per year as at Klondike. The shale is believed to be over 1,000 feet thick, substantially more than at Klondike. Static fossil groundwater underneath and in pockets in the shale is probably so saline and full of heavy metals that the tailings leachate has better water quality. Because of proximity to the Book Cliffs and some browsable vegetation, the area is far more likely than Klondike to contain cultural resources because of Native American hunting use. The area is considered to have very poor grazing utility because of lack of palatable forage species for domestic livestock and lack of water.

Response:

The estimated cultural site density of 1.9 sites per square mile at the Crescent Junction site is based on the actual number of cultural sites found on adjacent lands on similar soils and landforms. DOE agrees that it has characterized cultural resources at this site accurately. Also, see response to comment #14 and Section 4.3.8.1 of the EIS regarding grazing impacts.
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Document #58 Comment #21 Commentor: Christie, Richard Lance

3. Visual impact, latent cancer risk: We think the DEIS analysis of visual impact of reclamation in a disposal cell at Crescent Junction is correct, if an above-grade reclamation is used (S−19). As with Klondike flats above, we recommend consideration of a below-grade reclamation.

Response:

Final decisions concerning the design of the disposal cell will be made after the Record of Decision is issued.
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Document #58 Comment #22 Commentor: Christie, Richard Lance

We think that the stated latent cancer risk of 0.07 in 1000 years is correct for this site.

Response:

Comment noted.
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Document #58 Comment #23 Commentor: Christie, Richard Lance

4. Borrow material demand: The Mancos Shale at Crescent Junction probably meets disposal cell liner requirements if roller-compacted. Per 40 CFR 192 which specifies below-grade reclamation of tailings, the county has long proposed that the tailings be impounded at Mancos Shale sites by excavating receiving cells in the shale, roller-compacting the bottom, filling the cell with tailings, then covering the tailings with the reserved excavated shale/clay, molding the thick cap to a grade below the threshold of sheet erosion. This reclamation design might not require any borrow material to be hauled into the site. With a cap below the grade for gully erosion, no rip rap would be needed to stop such erosion. The roller-compacted Mancos Shale cap would have the same percolation characteristics as the proposed clay cap in the in situ reclamation alternative. Hauling in revegetation matrix soil from Floy Wash to this site to revegetate it might not be necessary if enough Book Cliffs outwash soil is available and reserved for cover from the disposal cell site and immediate vicinity.

Response:

DOE will consider the need for and availability of borrow materials in the disposal cell design, as well as methods to meet 40 CFR 192 requirements.
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Document #58 Comment #24 Commentor: Christie, Richard Lance

5. Use conflicts: There is currently no use of this area by mountain bikers or 4WD tourists. The road from Crescent Junction across the Christmas Hills to Floy Wash is used by stockmen, hunters, and others accessing Floy and some other canyons into the Book Cliffs. The major potential conflict, which the DEIS mentions, is with industrial uses in the industrially-zoned area of Grand County immediately to the east of the Crescent Junction site, particularly with already approved activities: pipeline construction and building a pumping/offloading complex by Williams Petroleum Products. This needs to be carefully evaluated since there are no apparent use conflicts associated with the Klondike Flats site.

Response:

It is assumed that the commentor intended to state that there are no apparent conflicts with the Crescent Junction site, as this is the section in the comments addressing Crescent Junction. DOE acknowledges the minimal use of the Crescent Junction site for recreational purposes and other multiple-use activities. Recent consultations with Williams Pipeline Company indicate that it has no firm plans to take action on its proposed facilities at Crescent Junction in the foreseeable future.
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Document #58 Comment #25 Commentor: Christie, Richard Lance

1. Cultural Resources: The DEIS correctly states that many cultural resource sites are likely to be impacted by both the disposal cell site at the White Mesa Mill and along the slurry pipeline route. The White Mesa Utes recently stated an estimated 120 National-Register-eligible sites would be obliterated.

Response:

Section 4.4.9.5 of the EIS states that 132 cultural sites eligible for inclusion in the National Register of Historic Places could be adversely affected if the Moab tailings were transported by slurry pipeline to the White Mesa Mill disposal site.
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Document #58 Comment #26 Commentor: Christie, Richard Lance

2. Groundwater hazard: Unlike the Klondike Flats or Crescent Junction sites, which are in an impermeable basement geologic structure with no freshwater below at any distance, the White Mesa Mill disposal cell overlies an aquifer in the Burro Canyon Formation which is used for water by the Mill and discharges in springs and seeps used by wildlife. The Glen Canyon Group of sandstones are further down, and comprise the water supply for the White Mesa Ute community 4.5 miles southeast which is geologically and hydrologically downgradient from the millsite. The Mill uses artificial liners for its uranium tailings disposal cells. One has already leaked.

Response:

The characterizations in the comment correctly reflect those in Chapter 3.0 of the EIS. Details of the conceptual design that would be developed to prevent disposal cell leakage from affecting potential water supplies if the White Mesa Mill site were selected are provided in Section 2.2.5.2 of the EIS.
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Document #58 Comment #27 Commentor: Christie, Richard Lance

We also have the risk of contamination of various areas along the high-pressure slurry pipeline route in event of a leak or rupture. Kane Creek, Muleshoe Creek, West Coyote Creek, and Hatch Wash are among the larger drainages crossed by the pipeline route; the first two have perennial flow. An additional risk point is the booster station 30 miles south of Moab.

Response:

Section 2.2.4.3 of the EIS acknowledges the possibility of slurry pipeline leaks and the safety, overpressurization, and leak detection measures that would be used if this transportation option were selected. An evaluation of surface water and other impacts associated with a leak along the slurry pipeline route to the White Mesa Mill is detailed in Section 4.4.4.2 of the EIS.
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Document #58 Comment #28 Commentor: Christie, Richard Lance

3. Truck transport: Combined with other site and cost disadvantages, the increase in average daily truck traffic through Moab of 127% if the tailings were trucked to White Mesa from Atlas makes this alternative totally unacceptable.

Response:

The comment accurately reflects impacts characterized in the EIS. DOE will consider this factor in its final decision-making.
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Document #63 Comment #1 Commentor: U.S. Department of the Interior

The National Park Service (NPS), U.S. Fish and Wildlife Service (FWS), and Bureau of Land Management (BLM) have been working with the DOE for several years as cooperating agencies under the National Environmental Policy Act to provide input on the scope of analysis, lands and resources of concern for this project, and technical information. All three DOI Bureaus appreciate the opportunity to be involved with you, other Federal and State agencies, and interested publics on this important project. During the scoping of the project, BLM helped in the identification of alternative sites and has initiated planning to recognize the sites for possible disposal to the DOE for relocation of the tailings.

Response:

The efforts of the National Park Service (NPS), USF&WS, and BLM have resulted in significant contributions to the generation of this EIS and its appended Biological Opinion, and for this participation DOE is very grateful.
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Document #63 Comment #2 Commentor: U.S. Department of the Interior

Generally, the DEIS is thorough and well-written with ample information and helpful graphics. However, we note that information on fish and wildlife species includes qualifying language identifying the need for additional information. The site-specific information cited is largely based on Utah Division of Wildlife Resources (UDWR) mapped observational data. Although we believe the precision of site specific wildlife data is inadequate for detailed project planning, we believe it is adequate for public disclosure and decision-making in this EIS.

Our major concerns for fish and wildlife resources arise from the significant uncertainties related to the effectiveness of groundwater remediation and the risks resulting from leaving the tailings pile located on the Colorado River floodplain. Specific conclusions for Federally listed species will be addressed in the FWS Biological Opinion on this project.

Response:

DOE appreciates the comment concerning the quality of the EIS. DOE concurs that site-specific information for wildlife species would be required for detailed planning and in the EIS commits to additional studies after the Record of Decision to identify the specific location of the disposal cell within the selected site. However, DOE would like to emphasize that the information in the EIS concerning wildlife species was a considerable coordinated effort with the BLM and Utah Division of Wildlife Resources (UDWR) biologists and extensive consultation with the USF&WS, not simply UDWR mapped data.

DOE acknowledges the uncertainties associated with ground water remediation in Section 2.6.3 of the EIS. DOE and USF&WS have discussed the potential for future impacts (river migration, flooding) on several occasions. These and other factors weighed considerably in DOE's identification of the Crescent Junction site as the preferred disposal location using rail transportation. DOE is confident that the proposed ground water remediation and relocation of the tailings, combined with mitigation required in the Biological Opinion (Appendix A3 of the EIS), would be protective of endangered fish.
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Document #63 Comment #3 Commentor: U.S. Department of the Interior

No Action Alternative

The Moab tailings site is located immediately across highway 191 from Arches National Park, on the banks of the Colorado River, and upstream from other national parks including Canyonlands and Glen Canyon. The tailings pile in its current location impacts visitors and resources of all these National Park units, as well as Grand County residents and recreational users of the Moab area and the Colorado River. The current tailings site produces various impacts and prevents various benefits that the site could potentially provide.

The No Action Alternative would also continue to cause mortality of Federally endangered fish species and adverse impacts to designated critical habitat. Other fish and wildlife resources in the vicinity and downstream would continue to be detrimentally impacted as contaminated groundwater would discharge indefinitely to the Colorado River and ammonia concentrations would continue to exceed protective levels. Additionally, the tailings pile would continue to be at risk of partial or catastrophic failure which would cause contamination of National Park System Units and aquatic and riparian habitats locally and for miles downstream.

Response:

The commentor's characterization of the Moab tailings site location and proximity to other resources is consistent with that provided in the EIS. The impacts from the tailings pile in its current location (the No Action alternative) to visitors and resources of all these National Park units, as well as to Grand County residents and recreational users of the Moab area and the Colorado River, are identified in Section 4.6. Additionally, the impacts associated with the highly unlikely event of catastrophic pile failure are addressed in Section 4.1.17.
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Document #63 Comment #4 Commentor: U.S. Department of the Interior

On-Site Disposal Alternative

DOE has launched a commendable research effort to control the concentration of contaminants from reaching the Colorado River. We appreciate these efforts. However, as stated in the DEIS and discussed in more depth at a Stakeholders meeting in Moab on January 14, 2005, the On-Site Alternative is fraught with uncertainties that have implications for protection and conservation of DOI lands and resources. The uncertainties involve: (1) groundwater remediation; and (2) Colorado River access to the tailings pile.

Groundwater Remediation

1. Although there are model predictions and groundwater pumping trials, the DOE acknowledges that there remains considerable uncertainty about whether groundwater remediation can be achieved to protective levels for aquatic resources and in what timeframe.

2. Seepage from the tailings pile represents a long-term source of groundwater loading that could result in longer term active groundwater remediation and/or higher residual groundwater contamination remaining after the conclusion of the groundwater remediation time period.

3. According to the DEIS (p. 4−7) "limited data suggest that there may be significantly higher ammonia concentrations in the upper 10 feet of tailings related to a 3- to 6-inch salt layer," and "available information is insufficient to reliably estimate the inventory of soluble mineral salts in the tailings, estimate the time for the salts to be completely depleted, or predict the future geochemical transformations that may occur." Nevertheless, the DEIS estimates that these high ammonia concentrations would reach the ground water in approximately 1100 years (just outside the regulatory timeframe of 1000 years) and then continue to dissolve for 440 years. It suggests that seepage from the pile during dissolution could have concentrations of up to 18,000 mg/L of ammonia, compared to "initial" (apparently current) ammonia concentrations of 1100 mg/L. Given the "insufficient" information about ammonia salts in the tailings, it would seem that this 1100 year prediction could be uncertain enough that an occurrence in less than 1000 years, within the regulatory timeframe and thus relevant to decision-making, is within the realm of possibility. A discharge of 18,000 mg/L ammonia would seem to seriously hinder the ability to reach or maintain the target goal of 3 mg/L ammonia in ground water.

Although uncertainty number 1 is common to all action alternatives, uncertainty numbers 2 and 3 are unique to the On-Site Disposal Alternative.

Response:

1. As the comment acknowledges, uncertainties related to the remediation time frames, costs, and other issues are addressed in Table S−1, item #1.

2. DOE's modeling efforts specifically consider seepage from the tailings pile in the estimates of time frames for successful remediation. Inclusion of pile seepage determined that on-site disposal would require 5 more years of ground water mitigation than off-site disposal.

Document #63 Comment #4 - response continued

3. As the comment notes, the EIS acknowledges the possible existence of an ammonia salt layer in the upper 10 feet of the tailings pile and acknowledges that if this layer does exist, a second pulse of ammonia contamination may leach from the pile at some point beyond the regulatory period of 200 to 1,000 years if the pile were left in place (Section 4.1.3). Based on modeling, DOE estimated that the leaching effects of an ammonia salt layer, if it exists, would not be observed at the underlying water table for 1,000+ years and, in the absence of any remediation, could continue for about 440 years. DOE did not simulate this effect with the contaminant flow and transport model or estimate costs because the existence of the salt layer has not yet been confirmed and also because the regulatory time period for the design of the cell is 200 to 1,000 years (40 CFR 192). As discussed in the SOWP (Section 6), attenuation processes (for example, biological degradation and sorption) make it likely that ammonia concentrations in the tailings fluid near the base of the pile would be considerably lower. If the on-site alternative were selected, DOE would implement more detailed field studies to confirm or refute the existence of the salt layer. Likewise, if the on-site alternative were selected, and if the existence of the salt layer were confirmed, additional field studies would then be implemented to characterize and map the salt layer. Based on these characterizations, more reliable transport modeling would be undertaken and, based on the results, a decision would be made regarding the need for mitigation measures. If found to be necessary and appropriate, mitigation measures could include excavation and treatment of the salt layer, which could eliminate the concern over a secondary pulse of ammonia that might occur in the year 3100 time frame. However, given the still-unconfirmed nature of the data regarding the salt layer or its possible future impacts, DOE has not performed additional characterization of the potential impacts and associated mitigation measures or evaluated costs beyond the material presented in the EIS. Section 4.1.3.1 has been expanded to include mitigation options for a salt layer, should they be necessary.

DOE concurs with the commentor that uncertainties in comment items #2 and #3 are unique to on-site disposal.

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Document #63 Comment #5 Commentor: U.S. Department of the Interior

There is preliminary evidence that contaminated groundwater can, and already is, reaching the Nature Conservancy's Matheson Wetlands Preserve (Preserve) via a gravel layer under the Colorado River (Gardner and Solomon 2004). Potential contamination of the Preserve and disturbance caused by installation and operation of a groundwater remediation system, should that be necessary, are serious concerns. The Preserve provides unique and highly valuable fish and wildlife habitat that should not be put at risk of compromise. The On-Site Disposal Alternative increases the likelihood and duration of contamination from groundwater being a significant concern for the Preserve.

Response:

DOE disagrees with Gardner and Solomon's (2003) assertion that contaminated ground water (ammonia and uranium) is reaching the Matheson Wetlands Preserve. Though it is true that dissolved ammonia has been identified in ground water on the east side of the Colorado River, it is probable that it is naturally occurring background levels. Ammonia levels in wells screened within uncontaminated brine near the river are typically in the 3- to 4.5-mg/L range, which is the same range observed in ground water on the river's east side. In addition, oil and gas wells drilled into the Paradox Formation in the vicinity of the Moab Valley have encountered brine with ammonia concentrations as high as 1,330 mg/L. These observations, combined with multiple lines of evidence indicating that the river and lowlands lying directly east of it act as a discharge location for regional ground water, including brine from dissolution of the Paradox Formation, suggest that dissolved ammonia in ground water east of the river is naturally caused. In addition to text in the SOWP (DOE 2003a), Figure 5 of Gardner and Solomon (2003) indicates that the Colorado River and its eastern overbank area act as discharge locations for Paradox-derived brine.

Regional and local discharge of brine and overlying fresher water to the Colorado River is explained using the concept of saltwater upconing. Just as a pumping well located above very saline to briny water will induce upward migration of the saltwater toward it, the river acts as a natural discharge site as it carries the influent ground water away along its course southward. When regional upconing of brine is significant enough to draw the brine surface to the elevation of the riverbed, the phenomenon is sometimes referred to as "unstable interface upconing." Occurrences of this type have been observed along a reach of the Smoky Hill River in Kansas (McElwee et al. 1981; McElwee 1985).

Two key characteristics of ground water flow are observed near river reaches affected by brine movement to the surface as a result of regional discharge of ground water. The first is that the fresher water lying above the brine represents a dynamic flow system, within which ground water velocities are relatively high. In this shallow domain and on either side of the river, measured hydraulic heads decrease with proximity to the river, indicating flow that converges on the river. Clear evidence for such converging ground water flow is presented in the SOWP (DOE 2003a), and Gardner and Solomon (2003) also illustrate this flow pattern in their Figure 6.

Document #63 Comment #5 - response continued

The second characteristic associated with brine movement toward a gaining river is the very low velocities that occur within the brine itself. This occurs largely because the dense brine presents a barrier to flow from the overlying and fast-moving fresher water above. The principles of density-dependent flow as affected by total dissolved solids (TDS) concentrations indicate that hydraulic gradients in the brine in the vicinity of the river will have a strong upward component toward the riverbed. Though it is possible to identify locales within the brine where upward gradients exist to drive upward flow, the complex effects of water density on flow direction (e.g., Davies 1987) make it extremely difficult to accurately estimate the ultimate flow direction and velocity in three-dimensional space. Any attempts to do so are highly uncertain unless a large quantity of piezometer data concerning water levels and TDS concentrations are available and they can be defensibly reproduced in a three-dimensional model of density-dependent flow (Jorgensen et al. 1982, Davies 1987). This high uncertainty also applies to the Gardner and Solomon (2003) analysis regarding potential flow under the river from the Moab site toward the Matheson Wetlands Preserve.

Gardner and Solomon's suggestion that Moab site contamination has caused dissolved uranium concentrations in excess of 3 to 4 micrograms per liter (µg/L) on the east side of the river is also not supported by existing evidence. This is because too many variables affecting uranium concentrations occur in this part of the Moab Valley to conclude that such concentrations can be attributed to a single cause. First, the effects of various physicochemical factors on uranium concentration, such as oxidation-reduction measures, pH, carbonate levels, and varying lithology of aquifer sediments, have not been determined. Thus, Gardner and Solomon's logic for defining a background concentration is difficult to defend.

The large range of measured uranium concentrations in ground water on the east side of the Colorado River (less than 0.3 to 111 mg/L; see Figure 11 in Gardner and Solomon [2003]) highlights the uncertainties and difficulties associated with determining a background concentration for dissolved uranium. For example, the range of uranium concentrations suggests that natural, spatially variable processes affect ground water chemistry locally. With this in mind, there is no valid reason to question the uranium concentration of about 59 mg/L reported by Gardner and Solomon for the N3 well cluster. This site is located about 4,500 feet east of the river (and about 1 mile east of the Moab site), and a smaller uranium concentration of 11.6 mg/L was observed at well cluster BL1 situated between N3 and the river. As discussed in the following paragraphs, estimates of the equivalent freshwater heads at an elevation of 1,190 meters above mean sea level indicate that ground water is moving from the N3 area toward BL1. Consequently, it is possible that the high uranium concentration observed at N3 is caused by natural processes and is not linked to uranium occurring at the Moab site.

Hydraulic interaction between the Colorado River and aquifer sediments on the river's east side, whether during high runoff in the river or baseflow periods, also was unaccounted for by Gardner and Solomon (2003). For example, the proximity of their observation well CR1 to the river, along with other evidence, suggests that river water has the potential to mix with ground water at this location. The effects of this potential mixing of waters of different chemistry on uranium levels are unknown.

Document #63 Comment #5 - response continued

Gardner and Solomon's contention that deeper ground water within the brine zone flows southeastward and under the river from the Moab site toward the City of Moab is based on the calculation of equivalent freshwater heads in brine at seven different locations at a uniform elevation of 1,190 meters above mean sea level. However, none of the wells used for this analysis has its screen centered at the 1,190-meter elevation; consequently, interpolation and/or extrapolation techniques are used to estimate equivalent freshwater head at this elevation. Because these calculations are carried out over vertical distances that range anywhere from about 1 meter to more than 10 meters (3.3 feet to more than 33 feet), the resulting heads should be considered approximate and highly uncertain. In fact, some of the computed heads could be in error by as much as 0.5 meter or more. Because Gardner and Solomon (2003) base much of their reasoning on computed freshwater heads that differ by as little as 0.2 meter over a distance of one-third mile, there appears to be little reason to place any significant confidence in their conclusions. It is not clear why Gardner and Solomon chose to base their freshwater head analysis solely on wells screened within brine. As long as equivalent freshwater heads are calculated at the common elevation of 1,190 meters above mean sea level, the heads computed for wells screened in non-brine ground water can also be used to discern potential flow directions. Applying this hydraulic principle to additional wells (N2, N3, N4, N5) that lie east of the wells included in the potentiometric surface assessment by Gardner and Solomon results in computed equivalent heads that are approximately equal to or greater than 1,207 meters above mean sea level. Since all of the heads computed by Gardner and Solomon and posted in their Figure 7 are less than 1,207 meters, inclusion of these additional heads in the analysis suggests that ground water tends to flow westward toward the river, not southeastward.

A few findings can be taken from the equivalent freshwater head calculations conducted by Gardner and Solomon (2003), but none of these supports their contention that contaminated water flows under the river. At those locales where deep well nests were installed (i.e., BL1, BL2, and BL3), a clear upward component of flow in the brine is indicated. As mentioned previously, this effect is predicted by the hydraulic principles of density-dependent ground water flow near a river receiving brine discharge. In addition, the equivalent freshwater heads calculated by Gardner and Solomon in wells located close to the river decrease with flow length along the river. This result is also expected since the average river surface elevation also decreases with distance downstream, but it does not indicate that brine water passes under the river from the Moab site to the Matheson Wetlands Preserve.

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Document #63 Comment #6 Commentor: U.S. Department of the Interior

Finally, as reported in a Salt Lake Tribune article dated December 1, 2004, regarding capped mill tailings in Monticello, commitment to long-term management/maintenance of capped contaminated sites can be problematic. This is of special concern when such sites are located immediately adjacent to environmental resources of special concern, such as the Colorado River and the Preserve.

Response:

The Monticello uranium mill tailings disposal project was conducted by DOE under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLA has different requirements than UMTRCA. The DOE-managed Moab site is an UMTRCA Title I site under the UMTRCA remedial action program. UMTRCA does not allow Title I sites to rely on active maintenance during the 200- to 1,000-year design life of the disposal cell. Activities such as occasional disposal cell erosion repairs, vegetation control, and ground water monitoring were envisioned as necessary functions, not considered active maintenance. Title I allows for active engineered ground water cleanup without time limitation. The article reported in the Salt Lake Tribune, dated December 1, 2004, is not relevant to the Moab Project. Long-term surveillance and maintenance activities would be conducted at the Moab site by the federal government during the design life of the disposal cell. This is a mandated federal requirement. DOE's Legacy Management program conducts these activities.
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Document #63 Comment #7 Commentor: U.S. Department of the Interior

Colorado River Access to the Tailings Pile

As noted in the DEIS and corroborated in presentations by U.S. Geological Survey (USGS) and others at the Moab meeting, 100- and 500-year and probable maximum flood events could reach and partially inundate the disposal cell. For example, USGS estimated inundation would be up to 4 feet with a 100-year flood event and 25 feet at the probable maximum flood. It is not clear, however, whether the DEIS model used to predict ground water remediation results (e.g. page 4−8) factors in the high likelihood that at least one 100-year flood would occur over the predicted 80-year timeframe for ground water remediation with the tailings pile capped in place. Nor is it clear whether the high likelihood of ten 100-year floods, with two of these also reaching 500-year magnitude, and the resulting effects of rewetting the tailings, is factored into predictions for ground and surface water over the course of the 1000-year regulatory time frame. Further, there is both recent and older geological evidence that the river has been near to or within the area presently occupied by the tailings pile. Although there is uncertainty about when, how often, and how severe a breach of the tailings pile could occur due to river movement, available evidence indicates that it is reasonable to expect that the river will reach and/or breach the tailings pile. This could result in the following impacts to fish and wildlife resources:

- Rewet contaminated materials which could enter groundwater and then the river.
- Mobilize contaminated surface materials which would most likely settle in other slower water habitats inhabited by fish and their food base.
- Spread contaminated materials into the Matheson Wetland Preserve, thus affecting nursery habitat for both native fish species and non-native sport fish species.
- Weaken the tailings pile, making it more vulnerable during the flood event and future events.

Response:

The EIS acknowledges the potential for flooding of the tailings pile (during and after active remediation) if the tailings were capped in place and quantifies the impacts that could result from such inundation (Section 4.1.3.1). These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. The text has been revised to clarify that the predicted discharge of 2 mg/L of ammonia to the Colorado River after a 100-year flood is not explicitly included in the modeling and could be in addition to the predicted concentrations characterized in Figure 4−1.

As stated in the EIS, Section 2.1.3.1, an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment (Section 2.1.4). These measures would prevent any catastrophic failure of an on-site disposal cell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and barrier wall if this alternative were selected.

Document #63 Comment #7 - response continued

As characterized in Appendix F, Section F.3.1, the commentor is correct that under the 100-year flood scenario, the river level would be approximately 4 feet above the toe of the pile, as occurred during the 1984 flood. During this flood, the unprotected pile was not breached because velocities decrease when the river flows over its banks. While additional ground water contaminants would likely be released to the environment during 100-year or greater floods, the resulting impacts to human health and the environment would not be catastrophic and have been discussed in the EIS.
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Document #63 Comment #8 Commentor: U.S. Department of the Interior

Various geologic data and engineering designs have been contemplated to reduce the risk of the river reaching the tailings pile. Discussions at the Moab meeting indicated that a great deal more information would be needed, and significant riprapping or hardening of the river channel would need to occur to reduce, but not eliminate, this uncertainty. The DEIS presented a preliminary proposal that included the following: a buried riprap diversion wall would be constructed; Moab Wash would be rechanneled; and unspecified stormwater management measures would be installed upstream. These and similar activities to "control" the river would eliminate habitat for endangered fish, change currents and sediment deposition patterns, and possibly affect the Preserve by increasing river movement and water force at the Preserve. Rechanneling Moab Wash and altering hydrology will affect riparian vegetation and sediment movement. These measures are detrimental to stream and river function and thus to aquatic and riparian habitats and the endangered fish and other wildlife that use them.

Response:

In the EIS, DOE considered conceptual designs for engineering controls that have proven effective and are in use at other remediation sites to mitigate environmental impacts, should the tailings be disposed of on the site (Section 2.1). However, none of these measures would occur within the Colorado River to "control" the river. Storm water management practices would be implemented to prevent discharges and, therefore, impacts to the river and aquatic habitats. Rechanneling of Moab Wash would return the wash to its pre-mill operations location to reduce the likelihood of impacts to the pile, and subsequently the environment, if the tailings were capped in place. Detailed analyses of the impacts associated with these proposed actions as noted by the commentor are provided in Section 4.1, Appendix A1 (Biological Assessment), Appendix A3 (USF&WS Biological Opinion), and Appendix F (Floodplain/Wetlands Assessment).
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Document #63 Comment #9 Commentor: U.S. Department of the Interior

Effects of a Disposal Cell Failure

The DEIS does not adequately address the risks to human and ecological health from contaminated sediment accumulation in the Colorado River sediment delta at the inflow of Lake Powell after a disposal cell failure. We agree with the findings in this section that there is a risk of releasing additional contaminants into the Colorado River water and downstream sediments, but we find no data to support the section's conclusion that sediment laden with uranium, ammonia and radium-226 would be deposited in the river bottom and become stabilized. We also find not data to support the conclusion that the presence of uranium, ammonia and radium-226 in the water and sediments that eventually reach Lake Powell would have only a short-term impact on human health, fish and wildlife resources or the environment. Our findings are that sediments in Lake Powell are relatively mobile and they get redeposited over both short-term and long-term cycles, depending on volume of inflow and other variables. Thus we question the conclusion in this section that toxic effects of a disposal cell failure would be negligible or short term. We suggest these conclusions should be reexamined in the FEIS.

Response:

Prediction of sediment behavior in the event of a disposal cell failure is fraught with uncertainty and would depend on numerous factors. Based on the proposed armament of the pile and the buried riprap wall (Sections 2.1.3.1 and 2.1.4) designed to intercept river migration, it is highly unlikely that a catastrophic failure of an on-site disposal cell would occur. However, to aid in decision-making, DOE has assumed failure and assessed the possible impacts in Section 4.1.17. DOE also has expanded this section to include a summary of the river mixing calculations that estimated downstream contamination. It is possible that effects could be more severe than those described in the EIS. DOE agrees with the commentor that some impacts would be long-term, except for ammonia, which is known to degrade and volatilize in the environment. The EIS specifically states that "...impacts from uranium in the sediments may be longer term because it complexes with sediments where it is likely to be more persistent" (Section 4.1.17). DOE agrees that sediments would continue to be redeposited over both the short and long term. This further supports the position in the EIS of more significant short-term impacts, because continued dilution and dispersion would reduce concentrated areas. Some long-term impacts would continue; however, the uncertainty associated with attempting to quantify them is high. Monitoring data indicate that site-related contaminants are not detected in the Colorado River downstream of the Portal. It is possible that with disposal cell failure, contaminants could be detected farther downstream, though effects would be difficult to predict with any certainty. Estimates provided in Table 4−17 indicate that uranium and ammonia (as nitrogen) concentrations in Lake Powell would be below the UMTRCA maximum concentration limit for uranium (0.044 mg/L) and greatly reduced for ammonia. Ammonia concentrations would be reduced further from degradation, volatilization, and dilution, and uranium concentrations would be further reduced from dilution before reaching downstream municipal water districts.

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Document #63 Comment #10 Commentor: U.S. Department of the Interior

The "camping" scenario is somewhat unclear, but seems to underestimate the camping use and other recreational use that occurs on the Colorado River and shores within a few miles downstream of the tailings pile. If the "two overnight camping events per year" in the scenario is meant to describe use by any single person, note that there are several popular BLM campsites along the downstream river shores, and that it is not unusual for individual visitors to camp at these sites well in excess of two days per year. Additionally, river users often spend more than two days per year boating, swimming and camping on the Colorado and shores between the tailings pile and Lake Powell. Commercial river guides may spend 75 days and nights or more per year on this section of the river. Boating use on the Colorado in Canyonlands National Park, which generally starts at various locations near or downstream from the tailings pile, is about 12,000 to 13,000 people per year, or over 31,000 visitor-use days per year. These users could be exposed to contaminants from a disposal cell failure, including radium-226 in sediments that would settle along river shores, which the DEIS predicts would be at levels "well above the 40 CFR 192 cleanup standards" and "could be of concern."

Response:

The camping scenario reflects the risks associated with contaminated soils and surface water that would exist immediately adjacent to the tailings pile on the bank of the Colorado River shortly after cell failure. Two days of exposure were used because it is unlikely that any one camper would repeatedly camp at a location adjacent to the tailings pile after a failure when there are numerous, more favorable camping areas elsewhere, as pointed out by the commentor. More favorable camping areas located downstream (including those sites that are closer to the Moab site) would have lower contaminant concentrations, thus mitigating the impact of increased use.

DOE agrees that there is and would likely continue to be substantial recreational use downstream of the Moab site. However, when estimating risk, the additional use does not compensate for the significant decrease in contaminant concentrations in these downstream areas. When estimating risk, an increase in the contaminant concentration (or exposure point concentration) is directly proportional to the exposure duration. For example, the estimated dissolved uranium concentration listed in Table 4–17 for 80 percent release at the Moab site is approximately 333 times Lake Powell concentrations. For exposure pathways involving water ingestion, the exposure duration would need to be 333 times greater (666 days per year [2 days' duration for camping times 333], which is greater than the 365 days per year that are available) at Lake Powell compared to the Moab site to account for this difference in exposure point concentrations. Concentrations would begin to drop immediately downstream of the site, so this same type of effect (to a lesser degree) would also occur for camping sites closer to the Moab site. Risks from gamma exposure from these materials compared to the risks estimated in Section 4.1.17 would be minimal, mostly because of the mixing and shielding with water and uncontaminated sediments.

Document #63 Comment #10 - response continued

Section 4.1.17 has been expanded to include the calculations that determined that downstream concentrations at Lake Powell would be at nearly background levels. Overall, DOE believes the assumptions made to assess risks in the EIS are adequately conservative and appropriate for this screening-level assessment. This assessment provides decision-makers with the information that, even though a highly unlikely event, catastrophic disposal cell failure, which could occur only under the on-site disposal alternative, could result in unacceptable impacts to river users.
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Document #63 Comment #11 Commentor: U.S. Department of the Interior

It is stated that "very small amounts of contamination would accumulate in the main river channel," but this does not consider the sediment delta, where much of the sediment would eventually accumulate. Later in the DEIS, it is stated that "much of the radium-226 would be expected to settle out in Lake Powell," reducing the risk downstream. However, risks associated with the settling in Lake Powell are not addressed. The estimated concentrations of uranium and radium in sediments that may settle out is probably sufficient to estimate contamination in the delta, but the residential scenario is inappropriate and the camping scenario is inadequate to characterize the risks. Visitors to Lake Powell generally camp on the shores of the lake. The level of Lake Powell fluctuates considerably, and visitor exposure to sediments at lower water levels is very likely. Remobilization of contaminated sediments by wind during low lake levels is also a concern. The average stay is over four days; a two day exposure, as considered in the camping scenario, is not realistic. Risk factors may also be exacerbated by the fact that Glen Canyon NRA has the highest rate of return visitors in the National Park Service. Many of the campers use Lake Powell as a source of drinking water. Risks to users of Lake Powell would also exist from bioaccumulation of contaminants in game fish. Additionally, at normal water levels, Hite Marina draws drinking water from the lake at a location directly over the sediment delta.

Response:

It is possible that if an on-site disposal cell failed, contaminated sediment could be deposited downstream in areas receiving considerable use by the public; this could result in higher exposures than those estimated in the EIS. Prediction of sediment behavior (including downstream deposition and partitioning to the surface water) in the event of disposal cell failure is fraught with uncertainty and would depend on numerous factors. Section 4.1.17 has been expanded to include the calculations that determined that downstream concentrations at Lake Powell would be at nearly background levels. See comment #10 for a discussion of risk to downstream users.
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Document #63 Comment #12 Commentor: U.S. Department of the Interior

We also suggest that the FEIS expand its action area or at least the cumulative impact section to recognize the impact of a disposal cell failure on downstream drinking water supplies. None of the municipal water districts that currently obtain water from the Colorado River downstream from the tailings pile have the technology or funds available to remove the levels of uranium, or other contaminants from their drinking water supplies in the event of a catastrophic failure.

Response:

Monitoring data indicate that site-related contaminants are not detected in the Colorado River downstream of the Portal. It is possible that with disposal cell failure, contaminants could be detected farther downstream, though effects would be difficult to predict with any certainty. Results of catastrophic failure provided in Table 4−17 indicate that uranium and ammonia (as nitrogen) concentrations in Lake Powell would be below the UMTRCA maximum concentration limit for uranium (0.044 mg/L) and greatly reduced for ammonia. Ammonia concentrations would be reduced further from degradation, volatilization, and dilution, and uranium concentrations would be further reduced from dilution before reaching downstream municipal water districts.
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Document #63 Comment #13 Commentor: U.S. Department of the Interior

Visual Resources

The narrative seems to underestimate the visibility of the disposal cell. It would be visible to virtually all, rather than "a limited number of," visitors to Arches National Park, from Highway 191 and the Park headquarters area, and from the switchbacks and the Moab Fault Overlook on the park entrance road above the Moab Valley. It would also be visible from a number of residences in the northwest part of Moab, as well as from hotels and other visitor destinations along highway 191 on the north side of Moab. We concur that the short-term visual impacts from this alternative would be "strong," but we question whether the long-term impacts would be reduced to "moderate" and whether vegetation would establish on the disposal cell to the extent simulated in Figure 4−6. We concur that lights for night-time operation at the Moab site or at any of the alternative disposal sites should be shielded.

Response:

DOE agrees that the existing Moab site disposal cell is visible to virtually all travelers to the Moab area. Section 4.1.11.1 specifically notes that residents near the site would be affected, as would travelers through Arches National Park traveling the access road (until after the hairpin turn atop the entrance road) and travelers on US-191. DOE believes that shrubby vegetation would become established on the riprapped side slopes of an on-site disposal cell in a manner similar to that depicted in Figure 4−6. This belief is based on experience with revegetation of other riprapped surfaces in the arid west, particularly on the surface of the Shiprock, New Mexico, tailings disposal cell. On this basis, DOE determined that the long-term visual impacts would be moderate. Should on-site disposal be selected, DOE would work with all potentially affected agencies and members of the public to mitigate, to the extent possible, these visual impacts.
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Document #63 Comment #14 Commentor: U.S. Department of the Interior

Uncertainties

Discussions at the recent Moab meeting indicate that it would take a great deal of additional time, investigation, and trials to reduce the uncertainties associated with the On-Site Alternative. On the other hand, these uncertainties can be avoided by moving the tailings pile offsite. Thus, although the On-Site Disposal Alternative has the least overall short-term surface acreage impacts, based on DOE's forthright recognition of the aforementioned uncertainties and the other concerns listed above, we believe this alternative has significant impacts to DOI lands and resources that could be avoided by choosing an offsite disposal alternative. Further, in the long-term, these resources could be improved by choosing an offsite alternative if the restored bottomlands were protected from development

Response:

Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment. As discussed in Section 1.4.5 of the EIS, post-remediation future uses of the site are not a part of DOE's near-term decision-making but would be considered after the completion of site remediation.

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Document #63 Comment #15 Commentor: U.S. Department of the Interior

White Mesa Mill Offsite Alternative

This site is located near perennial streams and wetlands that could be at risk from tailings disposal either through groundwater connection or loss of integrity of the stored tailings. The slurry pipeline would need to cross the Colorado River, the Preserve, 11 perennial streams, and at least 21 intermittent drainages. Both construction of crossings and potential leakage put these important aquatic and riparian habitats at risk. Trucking the tailings would result in greatly increased potential for wildlife mortality for 85 miles. These aquatic and transportation-related wildlife impacts would be greatly reduced under the other two offsite alternatives. We therefore recommend that the White Mesa Mill Offsite Alternative not be given further consideration.

Response:

DOE agrees with the commentor's characterization of the aquatic and riparian characteristics of slurry pipeline transport to the White Mesa Mill site. The EIS identifies the transportation routes for the White Mesa Mill alternative (Section 2.2.4) and associated impacts to ground water (Section 4.4.3), to surface water (Section 4.4.4), and to ecological receptors (Sections 4.4.6 and 4.4.7). The EIS also provides graphical representations of the pipeline and truck routes on USGS topographic maps in Appendix C. DOE will consider these factors in its decision-making.

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Document #63 Comment #16 Commentor: U.S. Department of the Interior

Crescent Junction Offsite Alternative

The primary differences between the Crescent Junction Offsite Alternative and the Klondike Flats Offsite Alternative are: (1) Crescent Junction is subject to extreme surface water flooding potential; and (2) Crescent Junction is 12 miles farther from Moab by road, increasing the potential for wildlife mortality. These differences result in greater potential impacts to wildlife resources with the Crescent Junction Offsite Alternative than with the Klondike Flats Offsite Alternative.

Response:

The EIS acknowledges that the Crescent Junction site has ephemeral streams that are ungauged and that the impacts of extreme flooding are unknown (Section 3.3.6). However, locating the disposal cell away from ephemeral drainages and implementing drainage control structures (identified in Figure 2−16) and other surface drainage control measures would mitigate this potential impact and environmental concern. The EIS also identifies the differences in transportation distances between the alternatives (Section 2.2) and the impacts on ecological receptors for each site (Sections 4.2.6 and 4.2.7 for the Klondike Flats site, and Sections 4.3.6 and 4.3.7 for the Crescent Junction site). For a given transportation mode, the increased distance of the Crescent Junction site would increase the potential for wildlife impacts. However, of the three transportation modes considered, transportation by rail, the transportation mode identified by the Department for the preferred alternative, would have the lowest potential to impact wildlife.
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Document #63 Comment #17 Commentor: U.S. Department of the Interior

Klondike Flats Offsite Alternative

As previously stated, this site is similar to the Crescent Junction site. However, there is less flood risk, and the site is closer to Moab. In addition, this site is near the existing airport and landfill, therefore disturbance has already displaced resident wildlife. Considering the soils at both sites, we believe the Klondike Flats site has the best potential (although still poor) for successful revegetation to native species. The Crescent Junction site includes Mancos shale soils and currently suffers from a cheatgrass infestation, making revegetation more problematic.

Although this and the other offsite disposal alternatives add 400 to 450 acres of temporary and permanent disturbance to surface soils and vegetation, we believe that the effects of the loss or reduced quality of these habitats is minor compared to the residual impacts and future risks to floodplain habitat associated with the onsite alternative.

We understand that the Klondike Flats Alternative may include offloading the tailings from the railroad to trucks in order to reach the site. However, extending the rail line is an option. We strongly encourage the latter, as additional handling of the tailings increases the risk of environmental contamination.

Trucking the tailings has the most potential to impact wildlife resources due to direct mortality, interference with movement from one side of the highway to the other (disruption of movement corridors and habitat fragmentation), and noise. The slurry pipeline avoids these impacts, although it would result in some depletion of water from the Colorado River. Slurried tailings may also result in localized surface or groundwater contamination. The railroad is not expected to cause significant wildlife mortality or obstruct wildlife movement; however noise would still be a consideration. Overall, we recommend avoiding the trucking alternative due to its higher potential for detrimental impacts to wildlife.

Response:

DOE acknowledges the commentor's assessment of the differences between these two sites and concerns regarding the potential for successful revegetation to native species. The paucity of existing vegetation at either site suggests that revegetation may be problematic in either case. The commentor is correct that the off-site alternatives would have larger areas of disturbance. The EIS does acknowledge greater uncertainty regarding some of the impacts associated with the on-site disposal alternative, though all alternatives are presented as being able to meet the protective criteria for the regulatory period of 200 to 1,000 years.

The Department acknowledges the commentor's preference for the rail option over the truck and slurry pipeline options and for extending the rail line at the Klondike Flats site to reduce the additional handling of the tailings and potential associated risks of environmental contamination.
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Document #63 Comment #18 Commentor: U.S. Department of the Interior

Section 2.1.3 Construction and Activities at Borrow Areas: Since initiation of the DEIS project and preliminary discussions with BLM staff in the Moab Field Office, a public health and safety issue with activities in the Crescent Wash/Ten Mile drainages has been identified. Flooding and severe dust storms commonly occur along the northern section of SR-191 and I-70 from Crescent Junction to near the State line. Storms, more prevalent during the spring and summer months, have resulted in public health and safety concerns associated with highway travel. There have been vehicle accidents and injuries during these events. The borrow areas referred to as Courthouse Syncline and Tenmile (as shown on Figure 2−8, Volume I of the DEIS) are of particular concern regarding this issue.

BLM and the U.S. Geologic Survey (USGS) have been collecting information and conducting research in this area to determine locations providing dust sources and mechanisms for dust movement. Preliminary information suggests the most severe dust storms are occurring from alluvial floodplains on Mancos derived soils in the Crescent, Thompson and Sagers Wash areas. Dust movement from these areas appears to be correlated with disturbance of these soil types, particularly west and southwest of SR-191 in Crescent Wash. Preliminary information suggests these storms are more severe in this area due to:

- The prevailing wind direction from the southwest aligning with the topography of the greater Ten Mile Wash area as it grades into the Crescent Wash,
- The presence of sand size particles in dunes at the head of Ten Mile Wash, providing a source for surface “saltation” particles,
- Abundance of fine-grained material from the Mancos shale and the alluvial sediments, directly adjacent to and downwind from upper Ten Mile Wash, providing a source for the airborne dust particles in this drainage, and
- The flatness of the overall drainage system, which allows winds and saltation particles to move more easily along the surface.

This system is further affected by the ongoing drought as vegetation is removed from the landscape, resulting in minimal natural trapping mechanisms for the entrained dust particles.

While DOE could and would require strict BMP’s to limit the quantity of dust that could come from borrow and other project areas during operations, it is the overall disturbance in these drainages from all the ancillary operations (even those activities on established roads), that would be associated with borrow or other operations over a sustained period of time that is of concern for the health and safety of the traveling public along SR-191 and I-70.

Alternatives to locating project components in the Crescent Wash/Ten Mile drainages should be considered.

Document #63 Comment #18 - continued

Response:

Based on this comment, DOE has had further consultation with BLM, which determined that the dust issues raised by the study would not affect DOE's use of the borrow areas assessed in the EIS or disposal at Crescent Junction. After the remediation decisions are made in the Record of Decision, DOE will continue to work closely with BLM in the final selection of borrow areas leading to BLM use permits. Mitigation measures such as those listed in Section 4.7.1 would be applied as needed to control dust during and after remedial activities at the disposal site and borrow areas.

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Document #63 Comment #19 Commentor: U.S. Department of the Interior

Paleontological Resources: All project areas should be analyzed for potential impacts to protected paleontological resources. Even though the geology sections of the EIS identify geologic formations in the project impact areas that have produced and have the potential to produce significant paleontological resources, the potential impacts to these resources have not been analyzed.

A baseline inventory of paleontological resources in the impact areas is needed to support an analysis of impacts. The inventory should be completed by a professional paleontologist licensed in the state of Utah. A list of paleontologists licensed in the state of Utah can be obtained from the BLM State Office.

Response:

Based on its current knowledge of the three alternative off-site disposal areas, DOE does not anticipate that potential impacts to paleontological resources would be a significant discriminator among or between them. With regard to the preferred alternative site identified in the EIS, the Utah State Paleontologist advised DOE that there is no potential for significant paleontological resources to occur at the Crescent Junction site. Nonetheless, DOE would conduct an analysis and baseline inventory of paleontological resources once an alternative has been selected. A professional paleontologist licensed with the State of Utah would be subcontracted to conduct the work. Mitigation measures, such as avoidance, excavation, and/or collection, would be implemented as appropriate.

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Document #63 Comment #20 Commentor: U.S. Department of the Interior

Section 2.3.2.1 Ground Water Remediation Options (pg 2−100): We believe that evaporation ponds, identified as a primary treatment consideration for the final groundwater remediation plan, have a high probability of being an attractive hazard to wildlife, especially because of their proximity to the Colorado River and the Preserve which are high use areas for wildlife. It will be important to incorporate measures to prevent wildlife access to the evaporation ponds.

Response:

The commentor raises a valid issue. This concern is acknowledged in Appendix A1-8.2 of the EIS and is a USF&WS conservation measure included in the Biological Opinion (Appendix A3). DOE has consulted with USF&WS on this concern and will continue to do so in the future. As discussed in Section 4.1.7.1, DOE would implement mitigation measures as appropriate. Measures might include screens, fences, netting, or noise to discourage wildlife access.
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Document #63 Comment #21 Commentor: U.S. Department of the Interior

The DEIS makes an effort to acknowledge and discuss various uncertainties involved in predicting impacts and costs of the various alternatives, including the possibility of river channe migration into the pile, catastrophic flooding, and the appropriate surface water quality standards and their effect on groundwater remediation time, and associated costs, with the pile left in place. There are various other uncertainties that could also come into play over the 80 to 1000+ year regulatory timeframe for management of the tailings, such as the possibility of increased upstream withdrawals from the Colorado River and consequent lower flows, and reduction of endangered fish habitat and water available for dilution of pollutants. The DEIS acknowledges that the tailings pile in its current location would be a continuing source of contamination that would maintain contaminant concentrations at levels above background concentrations in the ground water and potentially require institutional controls at the site in perpetuity to protect human health.

Response:

Regarding the appropriate water quality standard, DOE's modeling and analysis in the EIS indicated that ground water cleanup is anticipated to take approximately 80 years under the on-site disposal alternative. This is predicated on the DOE (and USF&WS) view regarding the appropriate and applicable ammonia surface water standard (protective criteria) for a ground water cleanup goal. The EIS has been expanded to present and discuss responsible opposing views, including the ammonia compliance standard (Section 2.6.4). DOE acknowledges that if the ground water cleanup standard proposed by the state were applicable, it might be impossible to ever achieve protective criteria under the on-site alternative. Therefore, the duration of requisite ground water treatment would be open-ended, and the cost of ground water remediation under the on-site alternative could be prohibitive.

A new Section 2.6.4 in the EIS addresses, to the extent possible, the implications of the various other uncertainties identified in the EIS, including cost, and the inherent limitations that would attend an attempt to precisely quantify them.

The EIS acknowledges uncertainties associated with river migration and catastrophic flooding (Section 2.6). DOE will give full consideration to these and all other relevant factors in its decision-making.
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Document #63 Comment #22   Commentor: U.S. Department of the Interior

The current Moab tailings pile and mill site is in a prime location: on the banks of the Colorado River, next to a busy highway at the gateway to Moab, across the highway from Arches and across the river from a key Nature Conservancy wetland preserve. This location has higher and better uses than to be left contaminated and unavailable to any beneficial use in perpetuity. Removal of the tailings from this site would eliminate hazards and create benefits for wildlife, such as endangered fish and southwest willow flycatcher, as well as for humans.

Response:

Several commentors raised similar concerns. Section 1.4.5 explains why the agency did not consider specific future beneficial uses of the Moab site in the EIS. However, DOE recognizes that relocating the tailings pile to an off-site location could provide the opportunity for future use of the site.
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Document #63 Comment #23   Commentor: U.S. Department of the Interior

We would suggest that the above factors, the uncertainties, the continuing risk in perpetuity, and the high value of the Moab site for other uses and benefits, are major drawbacks to the alternative of capping the tailings pile in its current location. The prudent alternative is clearly to move the tailings pile to a safer location. We suggest that the Klondike Flats site is the best location for the tailings, with the Crescent Junction site a second choice. Because of the infrastructure already in place and the separation from a highly traveled highway, rail transportation appears to be the best alternative for transportation of the tailings.

Response:

Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE’s identification of these preferred alternatives is provided in Section 1.4. DOE will take all relevant factors, including those raised in this comment, into consideration in its final decision-making.
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Document #63 Comment #24 Commentor: U.S. Department of the Interior

The Department appreciates the opportunity to provide these comments and expects NPS, FWS, and BLM to continue to work with DOE to plan and implement this project in a manner that avoids, to the greatest extent possible, detrimental impacts to DOI lands and resources. For further information please contact those Bureau staff with whom you have been working during preparation of the DEIS.

Response:

DOE appreciates the participation of the NPS, USF&WS, and BLM and the significant contributions these agencies and their staffs have made to this EIS effort and is committed to continuing this successful relationship through the duration of remedial activities.
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Document #65 Comment #1 Commentor: Heart, Manuel—Ute Mountain Ute Tribe

We have had some of these meetings up in Moab and also here, and up at the mill, and I am glad, Vivian, from the Department of DOE, I am glad you are here. Some of our meetings in the past we have asked representation from the Washington D.C. department, you guys that are here work under the department of the DOE or are affiliated to it in some way or another.

Response:

DOE appreciates the participation of the Ute Tribe.
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Document #65 Comment #2 Commentor: Heart, Manuel

Now, the culture guy down here at the end who thinks he is a culture expert on a lot of things, but culturally Native Americans are experts on cultural stuff themselves. These guys are just learning, and they just know the very basics of cultural stuff. I want to make that very clear.

Response:

DOE agrees that the experts on cultural resource issues are the tribal members themselves. DOE has subcontracted a professional ethnographer to visit and talk with tribal council members, tribal elders, tribal cultural resource specialists, and other tribal members to gather information about their concerns, sacred sites, and traditional cultural properties. This information allowed DOE to assess potential impacts to cultural resources under all the alternatives.
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Document #65 Comment #3 Commentor: Heart, Manuel

Also I want to make clear a government-to-government relationship with Washington, D.C. in a federally recognized tribe, the sovereignty that we have, it has to be put on record that we are a sovereign nation and we have to have this government-to-government relationship.

Response:

DOE has formally recognized the tribes that could be affected by the actions assessed in the EIS and has granted status as a cooperating agency to all that requested such status. The potentially affected tribes have contributed significantly to the identification of cultural resources and traditional cultural properties for the EIS. DOE will continue this relationship with tribes throughout its decision-making process and during the implementation of its decision.
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Document #65 Comment #4 Commentor: Heart, Manuel

Now, this gentleman talked about a few items here. He mentioned one thing, something about a big pile that it comes down to the White Mesa mill, and just keep in mind, this is only a draft, correct. And only looking at possibly three sites, Klondike Flats, Crescent Junction, the White Mesa mill. And what comes into play is money.

Right now we are in the middle of a war that the United States Government is unable to put enough money to put a slurry down here. If they do, there comes water, water rights out of the Colorado, how are you going to push that stuff if you don't have water rights behind that to push that tailings down here? So you have got issues of water rights out of the Colorado, and there is none, there is no extra water anywhere to push that slurry. The cost of bringing it down here is the most, 75 million, if the United States Government wants to do that.

Response:

Comment noted. Section 2.7.3 identifies the costs for each alternative considered in the EIS. Section 4.1.12 identifies that the White Mesa Mill alternative would require approximately 70 acre-feet per year of nonpotable water, approximately 3 percent of the water rights DOE currently possesses (3 cfs of consumptive water rights and 3 cfs of nonconsumptive water rights).
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Document #65 Comment #5 Commentor: Heart, Manuel

There are places out there at Klondike Flats which will have the least impact, the least impact on everything. There is already a railroad right there, transportation is there, a short distance, we are talking about a community, there was one community that was possibly a site, which was Green River, and they said population base, our population is growing here so we want to take that off one of our sites.

We also here have a population base that is growing also, and that has impact to our future.

Response:

The consequences of implementing all of the alternatives assessed in the EIS were evaluated equitably by DOE in identifying its preferred alternative. Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment.
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Document #65 Comment #6   Commentor: Heart, Manuel

So I really want to make this clear. Transportation, they talked about trucking also. Sometimes in the past we have had some trucking problems coming back and forth from tailings falling out of the back and not really properly strapped down. I have had community members complaining that they turn into the mill up here and there are some tailings on the road. Who is going to be accountable for things like that?

Response:

The commentor raises a valid concern regarding tailings that may be spilled during truck transportation. Section 2.2.4.1 of the EIS states that the tailings would be transported properly, with tarp covers over truck beds to prevent the dispersal of tailings.
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Document #65 Comment #7   Commentor: Heart, Manuel

Looking at our future impact, we have our groundwater resource for this community underneath this mill up here. We have probably three cells up here, and in the future, the extent to put in more cells and more tailings in here, impact where the tailings are going to be coming from. Currently the State of Utah is opposing the nuclear waste proposal up in the northwest. Once you open that up, and we have opened this mill down here to more tailings coming in here, the impacts it will have on the future from outside of the state, not only uranium tailings, but nuclear waste, the impacts that it will have for the State of Utah. We need not look at a residue for the State of Utah, but the health impacts it will have, environmental impacts it will have, all of these come into play, Clean Water Act, air quality, your major fishing, yes, fish are in there, but we also as humans have to live on this land, too.

Response:

Comment noted. Section 4.4 of the EIS identifies the ground water, surface water, and air quality impacts, as well as impacts to human and ecological receptors (including fish) associated with this alternative.
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Document #65 Comment #8 Commentor: Heart, Manuel

We have been in litigation for probably the last 30 to 50 years in the water rights settlement over in the Durango area, over those projects, and the fish was more important than the humans. The fish was very important to the Endangered Species Act. They were more important than the humans, and that is what they were trying to do in that project over there, and not have that project go through.

Things come up like this from environmentalists.

Response:

While recognizing the unique importance of human health and welfare issues, the EIS assesses impacts to all forms of life, be they plant, animal, or human.
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Document #65 Comment #9 Commentor: Heart, Manuel

So I need to look out long-term as a Tribal official, for my Tribal members here, and the impacts it will have on my kids, my grandkids, their grandkids. We are a growing population, we have cultural sites here, probably over 120 cultural sites.

I have people I would like to introduce here. Bill Johnson, from the Legal Department; Tom Reichart, Environmental Department; Terry Knight, Cultural; Carl Knight, Land Commissioner. We have Elaine, she was here; council members; and our community members back there from the White Mesa community. All these people who I am advocating for today, because this thing is not good for this community. We need to look at it, and talk right now about what is a good site. We propose the Klondike Flats, Crescent Junction areas as the site for the tailings. To bring it down here, long-term, is not feasible for us, it is for the United States Government, Department of Energy, it is just not feasible. So we recommend them two other sites.

As these guys come up and do their testimony and put it on record, what they feel also, that is up to them, the White Mesa Ute Tribe.

That is all.

Response:

The commentor's concerns regarding the impacts of relocating the tailings to the White Mesa Mill site are noted. Section 3.4 of the EIS identifies the current land use and known cultural resources identified through consultation with several tribal entities for the White Mesa disposal alternative.
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Document #66 Comment #1 Commentor: Knight, Terry—Ute Mountain Ute Tribe

I just want to make a few follow-up comments to what Manuel was talking about, and I just can't get over this idea where initially at some of the other meetings where we were at, like some of the other towns like Green River. Green River was taken off the list of places to take this uranium tailings to, because of the population there, or whatever. They had criteria of why they couldn't take it there, and we were told that the criteria for White Mesa mirrored the criteria that qualified Green River to take it off the list. So we said, why wasn't White Mesa taken off. So from that time on, I have had a problem with this wondering who and why keeps pushing this, the option to bring it down to White Mesa. Yes, we have a mill, you know, here, and that has been taken care of, but people are saying, no. And we don't understand, I don't understand which part of no that the State of Utah, the Department of Energy, and IUC don't understand. Maybe if I talked Ute to them maybe they might understand that, or Spanish or something.

Response:

Section 2.5.2 states that the basis for not considering the Green River UMTRCA site includes limited available space outside the floodplain and Interstate 70 (I-70) right-of-way. Sufficient space does exist at the White Mesa Mill site, though there are many other factors to be considered in final decision-making.

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Document #66 Comment #2 Commentor: Knight, Terry

But one thing that we do understand is dollars. And so that is where the amount of money that is going to be given to the State of Utah for monitoring whatever we are talking about, contracts and other things, and it is a large sum of money that would either go to the county or someone in the state there. And when you look at it, to endangering a number of people, it is just a few dollars, maybe millions and millions of dollars, but it is just a few for how long and for what, you know, because this is going to have a lasting effect. Just like our body—we cut ourself, it will heal, but it is going to leave a scar. How long does it take for uranium to dissolve, how many thousands of years? About 5 million years, so our people aren't going to be around that long, and just looking at it in that sense, you know, there is some horse-trading, back-room trading, whatever, and I just don't understand where people that are supporting within the state administration, within the Department of Energy, and of course ICU supporting, they are going to make money on it. Why would they keep pushing a bad situation? You know, this kind of really pisses our people off, and they think we are stupid. Like Manuel said, we were not as -- we don't rate as high as the fish that are going to be extinct or anything, you know. It is just another example of what non-Indian mentality is, of Indian people. And they are just people, you remember that.

Response:

DOE's decision-making is done under the bright light of full disclosure. DOE's NEPA process ensures that environmental information is available to public officials and citizens before decisions are made and encourages public involvement in decisions affecting the environment. For the Moab EIS, DOE has worked closely with the tribe to identify cultural resources and traditional cultural properties and has assessed exposure pathways that might be unique to tribal members. DOE will continue to consider the impacts to the tribes in its final decision-making.
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Document #66 Comment #3 Commentor: Knight, Terry

So just, you know, just say, well, what I read in some of the history books when the Mormons came and wanted to go down there and clear that area, and they didn't mean clear it of the vegetation, that meant wipe the Indians off, get them off of there. It kind of makes me think about those things, I wonder why. Yes, there is money involved, but is it that important? If it is, then move it over to Klondike. You know, we said, yeah, that is our part of our migration routes that the Ute people used. We are still going to be giving up something.

But the other thing that bothers me, if you start digging around there, maybe the reason they don't want to move it over to Klondike Flats is that when I go through there, there is a lot of people on the mountain bikes and horse riding, and maybe those people are, you know, recreational people, whatever, maybe they are, and they don't want to give that up, but they sure want to stick it down our throat.

But then again, the Ute people said that is part of our migration area. So we would be willing to, you know, let you have that.

Response:

The monetary cost of the alternatives, identified in Section 2.7.3, is only one consideration in selecting a preferred alternative. Chapter 3.0 of the EIS describes the affected environment for all alternatives, including the recreational land use impacts mentioned by the commentor. Regardless of the final remedy, if cultural resource issues remain, all appropriate tribal entities would be consulted and appropriate actions taken.
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Document #66 Comment #4 Commentor: Knight, Terry

And the other thing is the use of water. Manuel says, there is no water to be allocated anywhere in the west, and among the water allocated it is already over-allocated. Where are you going to get the water that is on the white man sites, but on the Indian site you can't do that with the water. After you get it down there, what are you going to do with it, wait 5 million years? No, that is definitely a no-no, and you are not supposed to do that with the water. Water is our lifeblood. We can't use it just to use it as a slurry. And, you know, this is one of the main things that we have.

Response:

DOE acknowledges the commentor's concern regarding the use of a limited water resource for slurry and will consider this comment in its final decision-making.
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Document #66 Comment #5 Commentor: Knight, Terry

And so, like, and the costs, who is going to pay for it?

Response:

DOE would fund the cost of the reclamation through funding appropriated by Congress from the General Treasury. In other words, the project would be funded by federal taxpayer dollars.
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Document #66 Comment #6 Commentor: Knight, Terry

You know, we are talking about the war and everything. But there is nowhere anywhere, within these meetings that we had, that I have attended, is there any kind of guarantee that would assure anybody, any person that this is safe and it is going to be safe, you know, and if something happens within this transit line, you people can always get up and go, you know, you came from Europe anyway, and you can go someplace else, but we can't. We live here, we are part of this, and we don't want this thing to happen. Like I said, we want to stay here, we want to live here. And so, you know, I hope you take this into account, think about it, what if it was in your back yard, what would you say? This whole area, this whole earth is our back yard, so we have that sentiment on it. So think about it in those personal terms. What would you do if they were going to do this in your back yard and you have your cemetery and your people? I am not even touching on the cultural stuff, and all that, that is going to take place. But if it does, then we have got numerous construction and resources, if it does, you are not going to do it without us cashing in on it, too, either way. That is all.

Response:

Comment noted. All comments and environmental impacts, including impacts to human health, socioeconomics, and cultural resources, will be considered in DOE's final decision-making.
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Document #67 Comment #1 Commentor: Knight, Carl—Ute Mountain Ute Tribe

I am sorry, I kind of forgot how the procedure goes, so, but anyway, you know, what I was saying about these things, you know, when you look at it within an individual's mind, you know what you want, you know what the road of life is for yourself, and you understand that. And when you are an individual, regardless of who you are, and where you come from, you do have that right as a person, and you look at it in any category, a person has a right. I have a right, and the rest of us out there listening, you do have that right also. And when it comes to maybe violating that right that you have, as an individual, a group, organization, agency, and when it comes to Indian Tribes, those Indian Tribes are a little bit different, and I don't think there is very many, not very many people that understand that. So when it comes to them they are not Tribes, they are nations, and that nation, that word nation, carries a lot of weight, and to hear one resource that I am talking about, get ahold of that law of nations, and they will explain it to you exactly what it is. And what I see is within that law of nations, the Ute Nation, if this does not go like the Tribe wants it, and then it is a violation, a violation of that law of nations, because they do have that right. Simply, the Tribe itself, is known as sane. This is dangerous, this is not for us, in a polite way of saying, please, don't bestow White Mesa with this uranium. Take it someplace else.

Response:

Comment noted. DOE will comply with all applicable regulatory requirements (see Section 7.0 of the EIS) in selecting and implementing the final remediation strategy.
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Document #67 Comment #2 Commentor: Knight, Carl

And that is why we have been at this for quite some time. And there are two sites that we are talking about up north in that kind of a remote area up there. If you are a normal person, you will say, that hardly anybody that lives there, there is no danger to human life. But here, in White Mesa when you look at it, there are people here. And it would be kind of a thing within a normal person's mind, by looking at the situation, to say, well, they have got some people down around Blanding, White Mesa, wouldn't it be better if we took it out there where there is hardly anybody around.

Response:

The land use and environmental justice sections in Chapter 3.0 of the EIS identify the land use and minority populations for the various alternatives. The information in these sections concurs with the commentor's position that there are fewer people in the northern alternative areas than at the White Mesa Mill site.
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Document #67 Comment #3 Commentor: Knight, Carl

On the other hand, uranium, I have done a little research over the stuff, and when you come to meetings like this, the good parts, the good part is to want what people focus on. But let me remind you, there is the bad part to that thing, too. The dangerous part of it, what it can do to a person, to an animal, to a plant life, it is very dangerous, but, you know, people don't talk about those things. And I am saying that within that line, what government agencies do, they don't just do things, they have a plan, they have a plan in place. So I am saying I think there is a plan for this, for this situation that we are talking about. Some people call it the preplan analysis. And other times the public have been used because that is not really -- that is not really how it is going to be, and they call it a public meeting, scoping meetings. But the plan that I am talking about is underneath all of this, and this is the way it is going to be, regardless of how many people oppose it, are offended, and I know what it is.

And I am saying for the people that is here, these people have that preplan analysis, and these, too, the Ute Mountain Tribe would like to have a copy of it, because I have seen it, I have seen it in different situations, to where there is always a plan. These people don't do things just to be doing things. That is how it is.

Response:

Throughout the EIS process, DOE has publicly expressed its intent to use both the EIS analyses (which included assessment of impacts to humans, animals, and plant life) and agency and public comments on the draft EIS to identify its preferred alternative for remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. There has never been any other plan.

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Document #67 Comment #4 Commentor: Knight, Carl

So I am saying along with my Tribal members here, that I think that with the benefit that people within the Blanding area, the White Mesa site area, and the people to the south toward the San Juan River, because if that uranium, if it ever gets away from these people, and then you have got the people to the south on that same drainage, and, you know, if it got worse, it could end up down in Mexico, and take up everything, contaminate everything to where that water flows. Even Las Vegas.

So I am saying this is not just a little thing. I think it needs to have a good look at things because it involves human lives, the way of life, because we are going to be here, we are not going to go nowhere. But if you want to know that it is going to make it to where you want to make the money off of this, on the Ute site, I am going to get my part, my pay, and then I am going to move on out, and go find something else to do.

Response:

Sections 4.4.3 and 4.4.4 of the EIS identify the ground water and surface water impacts associated with the White Mesa Mill disposal alternative. Under no scenario is there any reasonable basis to expect that there would be impacts to Mexico under this alternative.

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Document #67 Comment #5 Commentor: Knight, Carl

But I am glad in a way that I was heard, and there is a person here from D.C. It is kind of nice to have somebody from out there to come out here, and kind of know about the situation, of what is going on here. Because from what little I know, some of those people back there have never been here in the west. And I always said, can you make a decision with an issue that is going on in the west, how can you make that decision if you have never been there? That is what runs through my mind. But if you have been here and look at the grounds here, and then go back to the place where you come from, and look at it, and say, hey, this was a different experience. Now, that is what it is. I think we need to all understand and have that respect for each other as human people, not as I am better than they are, or I carry more weight, or I am the president of ICU, or whatever, you know, it don't work that way.

But I have seen it, and they call it kind of more like a big shot or something like that, you know.

But, you know, I am saying that something like this, you know, I kind of understand where the back-room deal comes in, too, and I have seen this, too, and I could pick it up quick, because I know what it is.

Response:

Unfortunately, the decision-makers in Washington are not able to personally visit every site that is the subject of federal decision-making. However, they will rely on the analyses in the EIS, input from staff who have personally visited all alternative sites assessed in the EIS, and other considerations in making a final decision. DOE's decision-making is done under the bright light of full disclosure. There is no "back room trading" affecting the final decision, which will be documented in a Record of Decision that will be published and distributed to all interested parties.

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Document #67 Comment #6 Commentor: Knight, Carl

So, you know, there is a lot of those that go on, too. And when that happens, it is benefiting just one group, or benefiting an individual, and that doesn't go very good, because what it does, it leaves a paper trail, and somewhere along the way, it is going to catch up with you. And it is not a very pretty sight, in that back-room dealing, it is a separate deal. Like the old saying, there is no honor among thieves. But I am saying keep it in the back of your mind that the people on White Mesa and behind it, we don't need a dangerous type of a chemical here, take it someplace else, and leave it there.

And I think the Ute people here are going to be here for a long, long, time, because it is not pretty, this uranium is not pretty. It deforms kids that is born, and this type of a thing, that is what we don't see when we have meetings like this, things like that, to me, to me it is dangerous. That is what I want to say.

Response:

The impacts to human health associated with the White Mesa Mill alternative are identified in Section 4.4.15 of the EIS. DOE's analyses did not identify any reasonable pathway for expecting that birth defects could occur from environmental exposure to the Moab tailings or associated wastes under this alternative.
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Document #68 Comment #1 Commentor: Redhouse, John

I will be brief. My name is John Redhouse, I am Navajo and Ute, and I am here representing the Diné CARE, Citizens Against Ruining our Environment, and our organizational position is that we are opposed to the selection of the White Mesa alternative as the preferred alternative for the reasons that are being stated today, that if this is selected and implemented it will result in environmental and cultural ruination, the kind of destruction that cannot be mitigated, but it can be avoided. So that is why we are participating in this public hearing process, in the EIS process. We also participated in the scoping meetings of two years ago. We also submitted written comments, and we will submit written comments on the Draft EIS by the February 18th deadline.

Also the next-year coordinator Allen Frazier will also be participating in the public hearings in Blanding this evening, and will amplify on our organizational position.

We are also opposed to the continuation of the White Mesa mill for reprocessing, disposal and milling purposes. Milling I know is being considered, and will result in the expansion of the White Mesa facility. Uranium mining is beginning to pick up on the south rim and north rims of the Grand Canyon, and also other parts of the Colorado Plateau. This will result in destruction, environmental and cultural destruction of Indian Tribes and Indian Nations here in the Four Corners of the Southwest, of the American Southwest. The Havasupai are the keepers of the Grand Canyon as are the Hualapai people. The trucking of the uranium ore from these mills, that IUC does have interest in, on the north and south rims of the Grand Canyon will also affect the Navajo, Hopi and the Southern Paiute Band, living in the Tuba City area.

Response:

Comment noted. The environmental and cultural resource impacts under the White Mesa Mill alternative are identified in Section 4.4 of the EIS. DOE has consulted with several tribes in the region, including the Ute, Hopi, and Navajo, to identify all cultural resource and traditional cultural properties for each alternative.

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Document #68 Comment #2 Commentor: Redhouse, John

And this uranium from the exploration of the mining, the milling, the disposal, it is like a cancer on the earth, and it must be stopped, it must be kept in the ground. And that is and will always be the organizational position of the Diné CARE.

Response:

Uranium mining and milling and waste disposal from operating facilities are beyond the scope of this EIS.

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Document #69 Comment #1 Commentor: Badback, Yolanda

My name is Yolanda Badback, I am one of the concerned residents here. I have got a paper here that I would look to present to the DOE here, it is a complaint that I want to give you guys, because you guys -- I have been attending meetings and you guys have not been hearing the words that we have been saying all the times at the meetings.

I have been attending meetings in Salt Lake, at the Radon Control Board there in which I keep giving papers out to them telling them what my concerns were and how I felt about having you guys bringing it down to the mill here. As for being a resident here I don't know of any other community members here that was aware of this meeting here, I haven't seen no fliers put out or anything. I don't know if the people here knew about this meeting or anything. But I got a call and they told me that they are holding a meeting here, so I took the time off of work just to attend this meeting, so I am here today, and to tell you my thoughts. After being a community member here, I do not like that the EIS does not have a translator to be before the community here since we have the elderlys here. We have a few elderlys that do not understand what is going on, even though you try to explain it to them and some of them, they say, they tell you a long story and they say, you know, where we come out and tell the public but there is nobody that will translate it. So I don't know if any of them are around here or anything, and I just present this paper.

That is all I have got to say.

Response:

DOE worked closely with the identified tribal contacts and followed their directions with regard to meeting notifications and the need for translators. Translators were provided during scoping meetings, although the tribal contacts determined that translators would not be needed for the draft EIS hearings. However, two tribal members who attended the draft EIS hearings were available to translate if such service was requested. No elder members requested translation services.
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Document #70 Comment #1 Commentor: Whiskers, Thelma

So, way back, me and my families, we have been fighting against this White Mesa mill for years and years. So finally, we invite the councilmen for them to know that when we are going to have the meeting. We have been going to the board meetings in Salt Lake, and I have been going to meetings in South Dakota, I have been to meetings in Idaho, Farmington, Shiprock, and I have got a lot of good friends, they are behind me, and here for myself, here -- I am not here myself, I am here with a lot of people are behind me. And I am so happy, and I work with my elderlys for them to understand, and the White Mesa mill is dangerous, and we don't want it to be close to our Reservation. We want it to be out of here, put it somewhere else.

I explain everything to them, and my people here, I care for them, especially the little kids. I really care for them. I am not on a board, I am not on anything. I care for my people, I love them, I explain everything to them, it is dangerous. This thing I am fighting against it. If I wasn't fighting against it this place will be going, it will be going.

Response:

Comment noted. The environmental and cultural resource impacts under the White Mesa Mill alternative are identified in Section 4.4 of the EIS. DOE has consulted with several tribes in the region, including the Ute, Hopi, and Navajo, to identify all cultural resource and traditional cultural properties for each alternative.
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Document #70 Comment #2 Commentor: Whiskers, Thelma

So I have been going to Salt Lake to board meetings and here. They are treating me like I am a little puppy, I was a little puppy, they didn't listen to me. I was complaining like this, same old words, I have been complaining to this.

So me and my daughter and my grandkids, we have been going to the meetings. So I got my families together and I said, you know what, we have got to do something, let's tell our councilmen, let's all tell our representatives for them to help us, help us, be with us, it wouldn't work. We are the only ones here in front of the radiation board. They are treating us like little dogs. They don't recognize our Reservation, they don't, they look over us. That is what they have been doing. They now -- so, I work with the person, we all got together, and we work together, and I am so happy that I am fighting against this.

Response:

DOE respects the commentor's point of view and in no way intended to indicate that her point of view is any less important than that of any other participant in the EIS process. DOE regrets that the commentor feels that she did not receive the respect she deserves from the Utah Radiation Control Board. However, based in part on the participation of this and other commentors with similar points of view, and the impacts as quantified in the EIS, DOE has identified Crescent Junction as its preferred location for disposal of the Moab mill tailings.
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Document #70 Comment #3 Commentor: Whiskers, Thelma

I don't want it to be close to our Reservation. No, that is dangerous, we don't want it.

Response:

Comment noted.
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Document #70 Comment #4 Commentor: Whiskers, Thelma

Since they closed that place, it is nice and clear, nice air every time when we go out, every morning. Before that, no, when we go out we used to smell that pollution. I wish you people would understand. I wish you would listen to us people here, from the Ute, Ute Tribe people here. I am, I am one of the elderlys, that is the way I feel because I have got a lot of grandkids, I care for the young ones, and here my nephew, he is suffering from the radiation, he is suffering. If it wasn't for me, yeah, it still would be going. If I didn't stand like this in front of you people, if I say, oh, it is none of my business, let it go. I don't even work for the money, I am not asking for the money, no, I am doing it on my own. I am doing it for my people here on this Reservation here. I get in front of the Radiation Board for years, years, years, and hear the people, and they started hearing my name, Thelma Whiskers, she is alone out there, fighting against the white nation. They are treating her like a little dog.

Response:

Comment noted. DOE regrets that the commentor has had negative experiences interacting with the Radiation Board.
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Document #70 Comment #5 Commentor: Whiskers, Thelma

So all the people from the south I met, they are my friends, they are helping me, they are behind me. Now I am really happy to see the councilmen are here, they are behind me now. I am real happy for them to help me. I am glad that they are here, they go to meetings, they went to the Green River meetings, they went to the Moab meetings, they were all here. I thought I was going to be there by myself again, standing in front of the Ute people here. And I am so happy for these guys are behind me.

I prayed every morning, so I am not by myself, I have got a lot of people from down south are helping me, they are behind me. So that is why I am standing right here. I am real proud of myself, standing on my feet here telling you people, I am against it, I don’t like it to be close to our Reservation. Which is I care for my grandkids, my kids, young people for elderlys.

Response:

Comment noted.
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Document #70 Comment #6 Commentor: Whiskers, Thelma

Now people are asking me, did they shut this place down? I don't promise them, I say I don't know. They ask me, you are the one fighting against it. Is that closed? Oh, that is good if it is closed down. You did really hard work to shut this place down up here.

My people here they don't get their water from this White Mesa water, they go uptown and haul this water, the drinking water. Even the young ones got, they got health problems, they think it is from the water that they drink. You never know, if it wasn't for me, these meetings would be boring. No, I said I don't want it to be close to our Reservation. Which is I care for my people here.

I stand up to the people when I go to meetings, I talk Navajo to them, they look at me, I thought you were Ute? Yeah, I am half. I am half Navajo and half Ute. But there is no hardly young people talks Ute, they just talk English. But I talk Ute and Navajo to my grandkids for them to understand, and what they are, what their plan is, for them to know.

Response:

Ground water impacts of the White Mesa Mill alternative are assessed in Section 4.4.3, and human health risks unique to tribal members who might ingest spring water or deer meat from the site are provided in Section 4.4.18. Based on analyses such as these in the EIS, and after considering the consequences of the uncertainties characterized in the EIS and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment.
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Document #70 Comment #7 Commentor: Whiskers, Thelma

And the sagebrush that we use for our home, for our fever, look what happened, there is nothing. And during the springtime, we usually get our tea, Indian tea, nice, and blooms with yellow flowers. No, we don't see that anymore, because of this White Mesa mill up here.

Response:

It is assumed that the commenter is referring to the operating White Mesa Mill site. Current operations at the mill are not DOE's responsibility and thus are not directly part of DOE's proposed action. However, the cumulative effects of existing operations (conservatively assumed to continue during DOE's actions) combined with DOE's proposed actions have been analyzed with respect to resource utilization, worker and public exposures, and other impact areas and are included in Section 4.4 where relevant.
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Document #70 Comment #8 Commentor: Whiskers, Thelma

Yeah, they, you people used to treat me like a little puppy, and I spread all my words, I need help, I want you people to help me, back me up, for you people to stand behind me. Let's shut this place down, tell them to get out of here, move it somewhere else where they have got water. Here we have got no water.

Response:

DOE respects the commentor's point of view and in no way intended to indicate that her point of view is any less important than that of any other participant in the EIS process.
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Document #70 Comment #9 Commentor: Whiskers, Thelma

For myself, I look at it now, because we stopped, now we have got good weather, it rains, moisture on our ground, maybe this springtime we are going to have a good, nice flowers around us, because there is no pollution, no smoke. It was killing our plants, what we used to use. Now, it rains good, now we are going to have a good land here, because we stopped this, there is no smoke, everything.

Response:

Relocation of the tailings to the White Mesa Mill site would not result in air pollution, including smoke, that exceeds existing air quality standards.
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Document #70 Comment #10   Commentor: Whiskers, Thelma

So I am here, and I am glad to see you people here, to be here on this White Mesa Ute Reservation.

I am not an agitated person, I am not on anything, I am not one of the board members, I am just living here on this Reservation. I help my people for them to understand. And good to see you people here.

Response:

DOE respects the commentor's point of view and appreciates her participation in the EIS process.
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Document #71 Comment #1 Commentor: Angel, Bradley

And our organization works with communities like yours, that basically affects your health and well-being, both from pollution, dirty industry and from governmental agencies, that sometimes and frequently I think that certain people are less important than others, and forget that their mandate is to uphold the law and treat all people of our country equally, and with the idea of democracy and justice that this country is supposedly founded on.

Response:

DOE does not agree with the commentor's perspective that government agencies feel "…that certain people are less important than others." DOE respects all commentors' points of view and in no way has indicated that any commentor's point of view is any less important than that of any other participant in the EIS process.
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Document #71 Comment #2 Commentor: Angel, Bradley

Last night there were a lot of people in Moab, and I am glad you folks are here today, too, and everybody who spoke last night is saying the same things that we are hearing today, people want the mess by the Colorado River moved, and they want it moved north, to the safest possible place, and in the safest way possible. Nobody wants it coming here, except IUC, and I am afraid possibly the Department of Energy.

Response:

DOE has carefully considered the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS. Based on these considerations, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment.
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Document #71 Comment #3 Commentor: Angel, Bradley

A few minutes ago, Tribe members presented a document, and I just want to go through some of that, and that was some Tribal members charging the U.S. Department of Energy with violating the civil rights of the Tribal members, and charging the U.S. Department of Energy in the formal decision complaint with taking action that desecrates sacred sites, interferes with traditional religious practices, and violates government mandates to uphold environmental justice. Why does that complaint have to be considered, why is it important? The Department of Energy by law has to consider all reasonable alternatives when discussing what to and deciding what to do with the Moab waste. And it is incredible and outrageous and unacceptable that somehow the Department of Energy we pay with our tax dollars somehow thinks it is reasonable to dump radioactive and toxic waste, slurrying it and using incredible amounts of precious water to be dumped here and to dump it next to the White Mesa Ute community on top of very sacred and cultural important sites.

Response:

DOE has taken no action that violates the civil rights of tribal members, desecrates sacred sites, interferes with traditional religious practices, or violates government mandates to uphold environmental justice. DOE worked closely with the Ute, Navajo, and Hopi tribes and consulted with other tribes and the State Historic Preservation Officer (SHPO) in the identification of cultural, historical, and archaeological resources and traditional cultural properties for all of the alternatives evaluated in the EIS. The results of these efforts were reviewed for accuracy by the tribes and the SHPO and are quantified for the White Mesa Mill alternative in Section 3.4.11. The potential impacts on these resources are quantified in Section 4.4.9, and environmental justice analyses specific to the White Mesa Mill site are provided in Section 4.4.18.
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Document #71 Comment #4 Commentor: Angel, Bradley

You know, in September 2003 I was at the meeting we had in Moab, and a number of the officials were there, and they spoke eloquently then, and I recall Mr. Knight, as he did today, say, what is it about no that you don’t understand. And I think it is really important that the opening comment today from Mr. Heart point out that it is the Tribe, the Tribal members that are the cultural experts, not the DOE. But the DOE doesn’t seem to understand that.

Response:

DOE agrees that the experts on cultural resource issues are the tribal members themselves. DOE has subcontracted a professional ethnographer to visit and talk with tribal council members, tribal elders, tribal cultural resource specialists, and other tribal members to gather information about tribal concerns, sacred sites, and traditional cultural properties. This information allowed DOE to assess potential impacts to cultural resources under all the alternatives.
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Document #71 Comment #5 Commentor: Angel, Bradley

The Tribal members and Tribal officials this morning brought out today, as they did a year and a half ago, that East Carbon was eliminated, that Green River was eliminated, and yet White Mesa continues to be considered. And I am extremely worried that all the good words and facts that were presented here this morning, were actually presented at the scoping, and presented in the confrontation meetings, and seeing that the DOE must have a hole in the head, and going in one ear and clearly out the other.

Response:

DOE is aware of the objections raised by the Ute Mountain Ute Tribe, the Southern Ute Indian Tribe, and the Navajo Nation over the assessment of the White Mesa alternative in the EIS. DOE's interpretation of the requirements of NEPA to evaluate "all reasonable alternatives" necessitated the inclusion of the site in the EIS.
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Document #71 Comment #6 Commentor: Angel, Bradley

One of the impacts that is not being considered is that the Tribal document has other responsibilities. They have to protect their people and land and culture. They should not have to be spending their limited time and resources fighting this outrageous and I believe illegal proposal.

Response:

Preparation of an EIS and the analysis of impacts under various alternatives do not constitute an illegal proposal.
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Document #71 Comment #7 Commentor: Angel, Bradley

The complaint that was filed, sent in the mail yesterday to the Department of Energy in Washington D.C. was presented, has four main parts. I will quickly go through them.

One, is that the Department of Energy violated the Executive Order 12898, which requires federal agencies to take environmental justice concerns into consideration. And not taking action, and addressing them as appropriate, disproportionately high and adverse human health or environmental effects of its programs on minority population.

Now, how is it that dumping radioactive and toxic wastes next to White Mesa Ute community on top of so many culturally significant sites is not arbitrary and discriminatory? It is.

How is it that eliminating the white community of Green River and East Carbon from consideration, but leaving White Mesa in, which is even closer, is not discrimination? It is.

Secondly, the Executive Order 13007, provides for the protection of Indian sacred sites, and it says that the federal government shall accommodate access to and ceremonial use of the Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

Please tell me, dumping radioactive and toxic waste directly on top of these sites would not desecrate and affect their physical integrity, it of course does.

Thirdly, Executive Order 13175, Tribal Consultation. As the Tribal government officials made very clear today and have made very clear in the past, you can't just convene a meeting and say you are consulted. This is land, it is the original land. Where I live I could get up and move, you people can't, this is your homeland, and that was not addressed in the draft EIS. So the Tribal consultation, I believe, has been a mockery, and the Tribe deserves to be treated by law and by right.

And lastly, 42 U.S.C.A., Section 1996, federal statute, Protection and Preservation of Traditional Religions of Native Americans. And it says, you shall preserve for American Indians their inherent right or freedom to believe, express and exercise their traditional religion.

You just heard testimony again, as we have in the past, that that is not being adhered to, and that if in the alternative carried out that is a violation.

So not only should you not do it because it is the right thing to do, you must eliminate White Mesa from consideration because the law requires that you do so.

Response:

DOE believes it has been conscientious in contacting and meeting with as many tribal entities as possible to listen to concerns and receive input on DOE's proposals. In April 2003, DOE initiated the consultation process by notifying potentially interested stakeholders that DOE was preparing a draft EIS. A total of 38 representatives from 14 Native American tribes and the Navajo Utah Commission were contacted by mail and telephone. To date, the Ute Mountain Ute

Document #71 Comment #7 - response continued

Tribe (including the White Mesa Ute Tribe), Southern Ute Indian Tribe, Uintah-Ouray Ute Tribe, Navajo Nation (including Aneth Chapter, Red Mesa Chapter, and Oljato Chapter), Navajo Utah Commission, and Hopi Tribe have expressed interest in or concerns with DOE's proposed alternatives. DOE has personally met with representatives of all the concerned groups. DOE's subcontracted professional ethnographer has also met on a number of occasions with tribal representatives. The Ute Mountain Ute Tribe is a cooperating agency on the EIS. DOE takes its tribal consultation responsibilities seriously and plans to continue to meet with interested tribal representatives.

In Section 4.4.18, Environmental Justice, the EIS clearly states that "Disproportionate adverse impacts to minority and low-income populations would occur under this [the White Mesa Mill] alternative as a result of unavoidable adverse impacts on potential traditional cultural properties located on and near the White Mesa Mill site, the proposed White Mesa Mill pipeline route, White Mesa Mill borrow area, and Blanding borrow area (see Sections 4.4.9 and 4.5)."
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Document #71 Comment #8 Commentor: Angel, Bradley

Lastly, I just want to say, there is one other thing that is not addressed in your Draft EIS, and not just from me as a director of an organization, with constituents in Moab, down to Arizona, a lot of the Tribes along the Colorado River, we guarantee that if this proposal is to be effected, there will be legal challenges, there will be administrative challenges, there will be nonviolent tactics to make sure there is no slurry line coming here, and it will cost incredible amounts in delay and financial costs that you haven't projected, and I am just giving you advance warning, it will be a fight that you don't want to get into.

Response:

Comment noted. DOE will continue to consider the comments received as it finalizes its decision.
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Document #72 Comment #1 Commentor: Fields, Sarah

I come here from Moab, and last night I was at the hearing in Moab where there were over 100 people, I believe, and probably at least 50 people spoke, and it was I believe unanimous that the people of Moab want the tailings to be moved off the floodplain, off the Colorado River.

Response:

DOE has carefully considered the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS. Based on these considerations, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment.
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Document #72 Comment #2 Commentor: Fields, Sarah

The citizens of Moab and Grand County also do not wish to have the tailings moved to White Mesa. A number of people spoke to that, and even if the tailings coming to White Mesa would not they also have to go through the city of Moab. The people in Grand County do not want it to come down here. That waste created in Grand County, the citizens of Grand County benefited from the mining operation in Grand County, and they feel that it is Grand County's problem. And the law requires that the tailings should be put in the most isolated situation where the tailings would have the least possibility for human intrusion, and environmental intrusion, and would be least likely to contaminate the environment. That certainly eliminates the White Mesa option.

Response:

Comment noted.
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Document #72 Comment #3 Commentor: Fields, Sarah

At the meeting last night the DOE said that the documents that were used for the DEIS were available. Well, yesterday morning I went to the Grand County library, where I have been continually doing research on various aspects of this, to take a look at the IUC proposal, because it is referenced. All I found was some colored slides from a presentation that IUC gave to the DOE or somebody at some meeting. The actual application that IUC submitted to the Department of Energy wasn't there. So it was not available to me to even comment in the DEIS process. Now, apparently the reason it wasn't there was because they submitted a copy to the Department of Energy, which has a lot of what is called proprietary information. Well, in that case the DOE is obligated to create a -- oh, somebody is talking, I am sorry.

The DOE should create a copy that has that proprietary information removed, and make that available to everyone. We shouldn't have to do a formal request to get that.

Response:

Copies of the IUC report with the proprietary information extracted were subsequently made available in all public reading rooms.
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Document #72 Comment #4 Commentor: Fields, Sarah

I also wanted to look at the cultural sites report that archaeology had created, and that is also referenced in the EIS. All I found was a cover sheet stamped confidential. So I couldn't even take a look at that. And I notice in the DEIS, it is pretty skinny when it comes to a description of the types of archaeological sites and the types of cultural resources that would be impacted if the tailings came down here. It has nothing, no pictures, there are no photographs, nothing to give the decision-makers any idea of what would actually be initiated, and there is not really any description of what mitigation means. Mitigation for cultural sites means the cultural sites gets dug up a little bit and people remove, they remove the bones, they remove the artifacts, the pots, the shards, the arrowheads, and then the site is totally destroyed, that is what mitigation means. Mitigation means destruction.

Response:

Section 304 of the National Historic Preservation Act allows federal agencies to withhold sensitive information relating to the location or character of cultural resources from the public. It would be a disservice to tribal members and other people who care about these sites if their locations were made known to the general public. DOE has shared this sensitive information with the appropriate tribal representatives. By withholding this information from the public, DOE is protecting the integrity of archaeological, historic, and sacred sites.

The EIS describes potential mitigation measures for cultural sites in Sections 4.1.9.1, 4.2.9.2, 4.3.9.2, 4.4.9.2, and 4.4.9.3. In general, mitigation might include (1) avoiding the cultural resource sites, (2) monitoring cultural resource sites during surface-disturbing activity, (3) excavating and recording cultural resource data before construction activities begin, and (4) moving cultural resource objects from areas of disturbance to nearby undisturbed areas.
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Document #72 Comment #5 Commentor: Fields, Sarah

Oh, another aspect of moving the tailings down to White Mesa is the fact that if they moved it by slurry line they would have to put a slurry line from the Moab site probably underneath the Colorado River, and across the Matheson Wetlands. The Matheson Wetlands are the largest wetlands on the Colorado River. The wetlands are owned and taken care of by the State of Utah and the Nature Conservancy. No one in the Department of Energy ever went to the Nature Conservancy, and I am unsure about whether they went to the State of Utah, but I know they never went to the Nature Conservancy and said, well, what do you think about this? Are you going to give us permission to put this slurry line across the wetlands? And if they had asked, they would have found out that the Nature Conservancy is not going to give them permission to run a slurry pipeline across the wetlands. But I guess the DOE has counted on their ability to -- the power of eminent domain when they just come along and say, okay, we have this project going and we are going to do it no matter what you think and no matter what you say.

Response:

DOE has consulted extensively with federal, state, and local agencies and stakeholders concerning potential impacts to all natural resources, including the Matheson Wetlands Perserve. This consultation included DOE obtaining the participation of 12 cooperating agencies to ensure that all concerns, including the potential impacts to the Matheson Wetlands Preserve that would be caused by a slurry pipeline, were considered. In addition, DOE received comments from the Nature Conservancy (see Document #699) and has responded to those comments. These actions, combined with regular meetings with stakeholders in Moab and extensive media presence, provided ample opportunity for all interested parties to comment.
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Document #72 Comment #6 Commentor: Fields, Sarah

The city of Moab is very concerned about putting a slurry pipeline through Moab. They are very concerned about trucking the tailings through Moab. So the people down here can count on the help and support of Grand County and the people of Moab to fight any possibility that the tailings would come down to White Mesa. Grand County does not want that option.

Response:

DOE considered the potential impacts associated with the actions described by the commentor. Based on the EIS analyses, the uncertainties characterized in the EIS, and the public comments on the draft EIS, DOE has identified the Crescent Junction site as its preferred disposal location for the Moab mill tailings.
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Document #72 Comment #7 Commentor: Fields, Sarah

And just like Grand County, the city of Moab does not want the tailings to be left on the banks of the Colorado River, and there will be administrative challenges, there will be legal challenges, if the DOE makes any determination to leave the tailings in place.

So I think between San Juan and Grand County we have two options that are off the table.

The first option is leaving the tailings in place, that is off the table.

The second option is moving the tailings down to San Juan County, that is off the table. And I sure hope the Department of Energy gets that message.

Response:

After carefully considering the analyses in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment. DOE will continue to consider the comments received as it finalizes its decision.
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Document #73 Comment #1 Commentor: Beck, Dudley

I just want to say, and add my name to the list of people against moving the mill tailings to White Mesa. I am very happy to hear the comments today, and particularly in reference to eliminating the White Mesa for anything, irrespective of the problem in Moab. I was glad to hear that.

Response:

Comment noted.
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Document #73 Comment #2 Commentor: Beck, Dudley

I have had tremendous respect for the Iroquois Nation since I was a young boy because of their philosophy of taking care of seven generations and planning for anything and everything that they do, and I have seen that throughout my lifetime now, in the native people, and the Navajo and the northwest Tribes, and I am glad to hear that is alive and well in the Utes, and I just wish it was alive and well throughout the white community throughout this great nation.

I am very scared as an individual, with the administration of this country. I think they have a plan and they could care less what most of us think or say. And that scares me. Our administration doesn't want to listen to science. We have great universities throughout the country who have spent years training scientists so that the administration can rely on their judgment in making decisions, and that does not appear to be happening.

Response:

In the EIS, DOE has not only assessed performance in the regulatory time frame of 200 to 1,000 years, but has also identified issues such as ground water travel times and subsidence of Moab Valley over tens of thousands of years. DOE will consider the commentor's concerns in its decision-making process.
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Document #73 Comment #3 Commentor: Beck, Dudley

When you are talking about global warming or clean energy use, and I would love to see us move back to the earlier philosophy of clean energy, and away from the uranium, and the coal-fired plants that created environmental problems for our community that we can ill-afford and that will affect our children and our grandchildren and our grandchildren's children.

Response:

Alternative energy sources are beyond the scope of this EIS.
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Document #73 Comment #4 Commentor: Beck, Dudley

We don’t want, I don’t want their blood money. There is no amount of money they can give us to mitigate these problems. And I would hope tonight that the San Juan County Commissioners would go on record against this formal process that we have been asked to participate in.

Response:

DOE regrets that the commentor apparently feels that there is no value in his comments. The free expression of public opinion on the alternatives assessed in the EIS is a vital part of the NEPA process that provides important input to DOE’s decision-making.
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Document #74 Comment #1 Commentor: Atcitty, Elaine—White Mesa Ute Indian Tribe

First of all, I would like to thank my Vice Chairman, Art, for being here, our legal counsel, William Johnson, Tom Rice, Terry Knight and Carl Knight for also being here and a couple other community members.

And, you know, we had these meetings for so many years now, and we had set up the meetings here, about three or four times a year in the past, as I do recall, and I continue to hear the same things, and I think all the people continue to hear the same things. What I don't quite understand is what part is it, like our Tribal Councilman said, what part is it that is going to get the DOE to eliminate White Mesa from being a site. You know, I see a lot of comments, and I hear a lot of complaints about the uranium mill out there at White Mesa. Air pollution is one part of them, water is another. It is not going to affect us tomorrow or next year, but in the years to come. That is what we are afraid of here in the White Mesa community, that our water is going to be gone and the uranium tailings will be getting into our water. Where are we going to go from here, where are we going to go tomorrow. I heard a lot of comments about dollars being exchanged. Yes, that is true, but for who. It is not White Mesa, it is not for me, nor is it for our grandkids. All we are taken away from is our house and our grandkids' house. What is it that, you know, that DOE and the uranium tailings, the people who do this, are going to say the day that we don't need this on our reservation. I have seen it come all across this United States, but I don't see it in the east there, but out in the isolated areas in the west, for the native Americans. This is their homeland, this is sovereign land, our great-great-grandfathers lived here. Yes, we had mining, back then, but they have long been shut down. There are some concerns. Mr. Heart, Vice Chairman Heart said the water rights, that is one of them, our Clean Air Act is another. We have enough problems as it is on our Reservation. We don't need to continue on with more problems coming to our people here.

Response:

The White Mesa Mill disposal alternative has been retained in the EIS as one of several reasonable alternatives under the requirements of NEPA. The environmental consequences of each alternative, along with other contributing factors such as costs, will be considered in DOE's final decision-making. Though there are reasons why the White Mesa Mill alternative may differ in suitability compared to another alternative, it is retained for consideration to ensure that all reasonable options are evaluated before a final decision is made. The tribal and public comments received as part of the NEPA process are important to this decision-making process.

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Document #74 Comment #2 Commentor: Atcitty, Elaine

And again I do support Thelma and her family back there, the lady, the advocate against this mill tailings way back then, for a number of years we was honored with a plaque for that, a service that he had done, the care that he had took, for his people here in White Mesa, I acknowledge that today here.

Response:

Comment noted.
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Document #74 Comment #3 Commentor: Atcitty, Elaine

There has been some bloodshed, yes, like Thelma who was an advocate against something like this. We don’t need no more of that. And, you know, I see things, you know, that transporting tailings, it is not going to work, either way it is not going to work and the people and the County Commissioners back there has made comments about this, too. What we are seeing here today, comments about our sacred ground, yes, that is true, our vegetation, is no longer there, the things that we use for native purposes is no longer there.

I mean I could go on all day here, but I think I made my point, and I would like to say thank you.

Response:

Comment noted.
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Document #75 Comment #1 Commentor: Lehi, Malcom—White Mesa Ute Administration

My concern is sitting back here listening to what is going on here, I have lived here a long time, and I have seen Thelma's family going after the mill about this trying to shut it down for so many years and always wondering what they were doing that for. But now I know what the reason is, because I used to go out there hunting and stuff and a lot of times I seen animals out there that were about the color they should not be, and I wondered why a lot of the times over the years when we would be back there for whatever, or for water, and there is not very much water around here, and the drought and stuff, and I always wondered why this would be. Hunters told me that he had seen the deer that he wanted to go shoot, and he told me, hey, let's wait on it, it will come our way, but it never came our way. But a day later we seen the same buck and somebody had shot it, and he told me, there is that buck you wanted, you want him now? I said no, and we looked at him and he had, the color of his skin was different, he wasn't normal, and I told him, I says, well, he was over there at that pond, and I don't know if the people that run the mill that was there realized what they are doing to the animals here, and it kind of made me feel bad, because, you know, we as native Americans, we used the animals in the sacred way, you know, to live, and feed our families and stuff. To make that deer go to waste like that, I don't think that was right, and somebody has to step up and say something about it and see that.

Response:

DOE acknowledges the importance and sacred history of natural resources and animals to Native Americans. In particular, DOE acknowledges these concerns as they relate to disposal of the Moab tailings at the White Mesa Mill site. On the basis of the EIS analyses, no evidence currently exists that disposing of the tailings at the White Mesa Mill site would result in adverse impacts to animals. DOE will consider environmental and human health concerns in its decision-making process.

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Document #75 Comment #2 Commentor: Lehi, Malcom

I don't know if the community of Blanding knows about this, that you were just saying are having a meeting, I hope they come out and have their say, and put out this mill and shut it down, because we do really have to shut this mill down, because of all the things that are going on around here in just San Juan County. And I am pretty sure, you know, for me, if I had the power to say things, you know, I would shut that thing down, because I don't think that is a place for the mill to be. I think it is better off where there is nobody or no life flow or anything like that.

You know, we have our, like, our councilmen and our people that were talking and saying it is the future we look at, not the past.

That is all I have got to say. I appreciate this.

Response:

Comment noted.

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Document #76 Comment #1 Commentor: Morgan, Manuel—San Juan County Commission

This is kind of a difficult position for me to be in, but I just want to say that the Tribe have spoken, the Ute Tribe has spoken and the people have spoken for this community.

I think people and communities have different priorities, as we represent San Juan County we have different priorities. And we try to, as elected officials, we look at what is good, or what is best, or what is economically best or economical for the community.

San Juan County's position is to support the slurry. With that position I have stated, I only support this if the DOE comes to this community and educates the dangers, the impacts, that the community is going to experience, and I don't think to this date that we have had that lesson, whether this is good or bad for this community.

Response:

Throughout the scoping and public comment process, DOE has sought to inform the public of the proposed alternatives and engage the public in the process. The commentor's preference for the White Mesa Mill alternative using the slurry pipeline transportation option is acknowledged
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Document #76 Comment #2 Commentor: Morgan, Manuel

I talked to a gentleman the other day, and he told me, he says, you tell me one particle of uranium in the air, and for me to breathe that in, has that radiation in there, is that safe for me. I says, I don't think it is safe, because if it has got radiation you will breathe it in. And from there you have the impact. And that, you know, I get comments that says, well, the sun rays have more radiation than that particle of uranium, okay. If that is the case, if we are introducing another particle that has radioactivity, how is that going to impact this community, because you are adding another element of which we are already exposed to, and together the impact of those is what we don't understand.

Response:

The health impacts from both radiological and nonradiological contaminant exposures of workers and the public are analyzed for each alternative in Sections 4.1.15, 4.2.15, 4.3.15, and 4.4.15, and for the No Action alternative in Section 4.6.15. Additionally, unique exposure pathways for White Mesa tribal members are assessed in Section 4.4.18.
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Document #76 Comment #3 Commentor: Morgan, Manuel

And so the community and the people that I represent have spoken and said that they are against this, and that is where I stand, is with my people. In this county there is 60 percent native Americans, and the DOE or this impact study basically addresses White Mesa community, and it is stated there are 300 people. The town of Blanding has how many people, San Juan County has how many people, and the impact of that is minimal because there is 300 people, that is not the case. Like I said, there is over 7,000 native Americans in this county, and they say no to bringing the tailings down here, and that is where I am going to have to stand on this issue, and I will also stand on this and present that to the county in that way, if you are wondering where my position is.

Response:

Comment noted. The environmental and cultural resource impacts under the White Mesa Mill alternative are identified in Section 4.4 of the EIS. Section 3.4.18 identifies the demography of minority populations in the White Mesa Mill area. DOE has consulted with several tribes in the region, including the Ute, Hopi, and Navajo, to identify all cultural resources and traditional cultural properties for each alternative. In addition, the tribal and public comments received as part of the NEPA process are important to this decision-making process.

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Document #76 Comment #4 Commentor: Morgan, Manuel

I am not going to bash anyone, the DOE for doing what they are going.

I am not going to bash IUC for what they are doing, I understand what their job is and what they are up to, and what they provide communities. But when there is an unknown impact of something that we will -- what we don’t know until in the future, then we need to support one another and stand together and say if you can’t provide those answers to us, then we don’t want it.

Response:

DOE has endeavored to develop a comprehensive EIS in compliance with the requirements of NEPA to identify the full range of potential environmental impacts associated with each alternative. DOE acknowledges that there are some uncertainties associated with each alternative. Section 2.6 of the EIS identifies these uncertainties.

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Document #77 Comment #1 Commentor: Goodman, Margaret

I just wanted to put in some comments to say, you know, Mr. Morgan was right, we have a little bit more different priority than probably you gentlemen here. As native Americans, we cherish animals, even the weeds that grow around here and things like that, that is a priority for us in our everyday lives. And the uranium mill, it seems like to me, as I have heard, you know, like the gentleman over there said, there is deer, rabbits, and for unknown reasons their meat is a different color, breeding and what-not. And the deer go to the water hole over there, and as uranium is being packed or however the process goes, you don't know how much dust is coming off of that thing in the air, even a slight breeze how many people are going to inhale that dust, you know.

Response:

DOE acknowledges the importance, and sacred history, of natural resources and animals to Native Americans. No evidence has been provided to DOE that indicates that current operations at the White Mesa Mill have resulted in adverse effects to animals or human health (for example, from dust that may be inhaled). During the preparation of this EIS, neither the NRC nor the State of Utah, past and present regulators, respectively, and both cooperating agencies in this EIS, have indicated that current operations are causing impacts to animals. If contaminated dust were possible, DOE would be required by federal and state regulations to control it so that no adverse health effects would occur.
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Document #77 Comment #2 Commentor: Goodman, Margaret

And like he said, how many people came down to teach all these people, Tribal members here about this mill site. I don't see an interpreter here today, you know. If you want to step on the grounds of reaching everybody in the community I think that, you know, that is not right, there should be an interpreter, there should be somebody here that can get in contact with the Tribal members and actually see who is going to understand and who is going to know, see what you guys are trying to do. But the fact of the matter is, Native Americans do cherish the earth, the ground, the flowers, the weeds, whether it is a good weed or bad weed, some of it is medicine for people, who are ill, you know.

Response:

The decision not to provide interpreters at the public hearings on the draft EIS was made by the tribal contact interacting with DOE. Interpreters were provided at the scoping meetings, and tribal members willing to serve as interpreters were available at the public hearings if they were needed. No attendees indicated that they needed an interpreter.
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Document #77 Comment #3 Commentor: Goodman, Margaret

So I think that, you know, there has to be a lot of thought put into this and a lot of avenues to take to talk to the community members here, basically for their health. And basically for all the animals that we cherish. For some of them, it is their everyday meal, you know, that is the meal on their table for them.

Response:

In Section 4.4.18, Environmental Justice, DOE analyzed the potential impacts to an individual from consumption of meat from mule deer that obtained 100 percent of their food and water from on and near the White Mesa Mill site. The individual was assumed to obtain 100 percent of his or her meat from these mule deer. Results of the analysis indicated that the individual's risk of cancer from consuming the deer meat would be less than that predicted for members of the general population.

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Document #78 Comment #1 Commentor: Weisheit, John

These three groups of which I represent, I am by the way the secretary of -- secretary-treasurer. The three river groups would like the tailings pile removed. As to whether it is Klondike or Crescent, we believe that those would be the best places to put it. However, we feel Crescent would be better, because the Mancos shale is thicker. The watershed is not as big, you know, it is next, very close to the Bookcliffs, which is kind of a watershed divide.

Response:

DOE considered these features in identifying Crescent Junction as its preferred alternative. DOE will continue to consider the comments received as it finalizes its decision.
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Document #78 Comment #2 Commentor: Weisheit, John

But we do have one concern about Crescent Junction, and that is there is a person that lives there, even the gas station has since closed and the cafe has since closed, but we are concerned about that person's -- I was hoping that person would be here, but they are not. But we would appreciate it if this person is contacted to see how they feel about this particular placement, and as far as their safety and so on.

Response:

Comment noted.
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Document #78 Comment #3 Commentor: Weisheit, John

We are very opposed to having the site taken to San Juan, mostly on -- for moral reasons. We feel that this is Grand County's problem, and we think it should stay in Grand County. We really don't want to spread our waste to other places to be dealt with. And as far as environmental justice reasons, we sympathize with the White Mesa Indian Tribe, we do not want to bring our pollution to affect their groundwater, so we are not at all in favor of imposing the environmental justice and socioeconomics on the native American groups and whatnot.

Response:

Comment noted.
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Document #78 Comment #4 Commentor: Weisheit, John

Number two, the reason why we feel it should be moved is because we feel that there is enough reason to show doubt that this pile, if kept in place, would remain in place for 200 to 1,000 years. We, as river people, we understand the dynamics of rivers and we are well versed in what the U.S.G.S. and other scientific groups have had to report on the hydrology of the Colorado River, and we believe based mostly on two major floods in the 19th century that happened in the 1800's, 1860's and 1880's, as well as the flows of 1917, 1983 and '84, that we feel that the place would be compromised and that this radioactive material associated with, and with all the other associated chemicals, would go into Canyonlands National Park, radiate all the beaches, and would essentially stop our business, as far as river guides and river, private river runners that are using Canyonlands National Park. We feel it would shut the park down, and we feel that would be bad for us as workers on the river, it would be bad for our city, which depends on tourism, and also of course it would be bad for -- that kind of mobilization of radioactive material, it would be Nevada's water supply, and California's water supply and Arizona's water supply. So we want to be good neighbors, we don't want to spread our waste around on the Colorado River system.

Response:

DOE's analyses support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. Differing opinions on this conclusion are discussed further in Section 2.6.4 of the EIS. To mitigate the potential impacts of river migration under the on-site alternative, DOE would include a barrier wall (identified in Figure 2−3 and discussed in Section 2.1.1.1 of the EIS) with riprap sized to withstand the maximum velocities projected by the USGS report. Further, DOE has acknowledged the uncertainties regarding this issue and its effect on long-term performance in Section 2.6. The EIS also assesses the consequences from flooding (Section 4.1.3.1); this assessment concludes that expected periodic inundation of the pile would not lead to discharges to the river that would be harmful to aquatic life or humans.

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Document #78 Comment #5 Commentor: Weisheit, John

We are also concerned about the endangered fish because the Colorado River has the highest rate of possible extinction of native fish, and so we are very concerned about the quality of the native fish, and we feel that anything that we can possibly do to minimize their extinction, and this is definitely one of the things that we are concerned with.

Response:

The analysis of alternatives considers all fish and wildlife, and endangered fish are specifically considered in the consultation documents prepared by DOE and the USF&WS (see Appendix A1, Biological Assessment, and Appendix A3, Biological Opinion, in the EIS). Protection of fish and wildlife is the primary reason why DOE has identified active ground water remediation at the Moab site as part of its preferred alternatives. These remediation activities would decrease the current influx of contaminants from the pile and ground water into the Colorado River. The USF&WS is working with DOE to design a monitoring program to ensure that the ground water remediation activities would be successful in reducing impacts to the fish and wildlife of the area. In addition, DOE's preferred alternatives include moving the pile to the Crescent Junction site, which would, if implemented, reduce any impacts from interactions with the pile and the river in the future. DOE will consider these factors in its final decision-making.
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Document #79 Comment #1 Commentor: Fields, Sarah—Sierra Club

One thing that I think the DOE has to do is really go back over the Uranium Mill Tailings Radiation Control Act and the legislative history of that Act, and think about what the intent of congress was when they passed that Act. And I have a few quotes here. And this is from the legislative history. "The Legislation will require every responsible effort to be made by the Federal Government to provide for the disposal, stabilization and control in a safe and environmentally sound manner of such tailings to prevent or minimize the diffusion of radon" or the entry of other hazardous things into the environment. It also said that the public is to have a strong role in the selection of any remedy to procedures provided by the National Environmental Policy Act. It is expected that the Secretary, that is the Secretary of Energy, will give full consideration to the wishes of the public, as expressed through those processes. That is the wishes of the public. In some cases where the department will remedy inactive tailings hazards, tailings will be removed from the original processing site, and disposed of at more suitable locations.

It is intended that the DOE not rush headlong into using technology that may be effective in the short period of time. The committee does not want to visit this problem again, with additional aid. The remedial action must be done right the first time. And in the Act itself, it says "Congressional Findings and Purposes. Protection of the public health, safety and welfare and the regulation of interstate commerce require that every reasonable effort be made to provide for the stabilization, disposal and control in a safe and environmentally sound manner of such tailings in order to prevent or minimize radon diffusion into the environment and to prevent or minimize other environmental hazards from such tailings." And in response to this, the Department of Energy moved at least 10 uranium tailings sites from inactive mills off the floodplains of nearby rivers.

Response:

DOE has complied with UMTRCA and NEPA in the preparation of this EIS. DOE has considered the analyses in the EIS and comments on the draft EIS in identifying off-site disposal at Crescent Junction as its preferred surface remediation alternative and will continue these considerations in its final decision-making.

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Document #79 Comment #2 Commentor: Fields, Sarah

So I think that under these circumstances where you have even a greater risk of contamination going into the river, where you have even greater risk because of all these unknowns that were listed up here on the board, of the risk of flooding, the questions regarding how much contamination is still in the tailings impoundment, how much that contamination will continue to go into the groundwater, even after the current groundwater remediation is over, even if it takes 100 years. So we have all these questions.

So I think it behooves the DOE to move the tailings pile off the river in order to comply with the Act.

Response:

DOE will consider the impacts of each alternative, uncertainties in the analyses, comments on the draft EIS, and other factors in its final decision-making.
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Document #80 Comment #1 Commentor: Weisheit, John

Yes, there is another example of what I wanted, I was concerned about, because the Bureau of Reclamation did a study that I would like to bring to your attention about the probable maximum rainstorm that could happen on the Colorado River system and at Hoover Dam as the site for the full amount of water that could come through, and it was 700,000 cubic feet per second. Now, of course that includes the San Juan and Colorado and Green Rivers but, you know, it just goes to show the dynamic ability of the Colorado River, and I just find in general, and I will detail these in my comments, but I really don’t think the DOE has a credible document to otherwise prove reasonable concerns that this tailings pile will not lift and float downstream in a catastrophic event. We are already overdue for a 100-year flood, and so, you know, it seems like we are ready for a situation there that needs to be looked at with much more credibility.

Response:

DOE’s analyses support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. Differing opinions on this conclusion are discussed further in Section 2.6.4. To mitigate potential river migration for the on-site alternative, DOE would include a barrier wall (identified in Figure 2–3 and discussed in Section 2.1.1.1) with riprap sized to withstand the maximum velocities projected by the USGS report. Further, DOE has acknowledged the uncertainties regarding this issue and its effect on long-term performance in Section 2.6. The EIS also assesses the consequences from flooding, Section 4.1.3.1; this assessment concludes that expected periodic inundation of the pile would not lead to discharges to the river that would be harmful to aquatic life or humans.

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Document #81 Comment #1 Commentor: Fields, Sarah—Sierra Club

One thing as far as the alternative, I would agree that the best alternative would be to move the tailings to Crescent Junction. The only other possible alternative would be Klondike Flats. I think it is out of the question to send the tailings down to White Mesa, because of the nearness to the White Mesa Ute community, because of the impact on the cultural sites at White Mesa where some very beautiful archaeological sites, which are now hidden, because most of -- they are under the ground, but those sites will be destroyed.

Some of the differences between Crescent Junction and Klondike Flats are the fact that the Klondike Flats site is right next to an airport, it is also next to a county disposal site, and another thing, it is in an area that is frequented by a lot of visitors, there are a lot of people who ride bicycles, they ride ATVs, they ride motorcycles, dirt bikes in that whole area. And that means going to another area, which will be, will be impacted, and I think that site has a greater chance to be impacted by human activity, and the site would also impact the workers and visitors in that area.

Response:

The commentor's preference for disposal options is noted. If the White Mesa Mill disposal alternative were selected, DOE would complete all appropriate characterization of cultural and archaeological sites, as necessary, and take actions to mitigate impacts; all appropriate laws and regulations would be followed. The differences between Crescent Junction and Klondike Flats noted by the commentor are described in the EIS, including proximity to the airport, a county disposal site, and the potential impacts to recreational use of the area.
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Document #81 Comment #2 Commentor: Fields, Sarah

Also I think that the tailings should be moved by rail, considering the amount of tailings, the rail haul option, not truck haul. The truck haul option would mean almost 100 percent increase in traffic on the road, either between Klondike Flats or Moab and Crescent Junction. That means impact to the tourist industry, and that means degradation of that highway, when you have those huge trucks. And I think the other thing, that UDOT expressed their concerns to the DOE about what would happen to that roadway if it were used to haul those tailings up the road.

Response:

DOE considered this concern carefully in arriving at its decision to select rail as its preferred transportation mode.
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Document #81 Comment #3 Commentor: Fields, Sarah

Also I think that the DOE should consider why we are here, why did this all happen, why did it happen. The DOE ended up with the responsibility for this site, and the reason was because another federal agency failed to regulate the site. The Nuclear Regulatory Commission did not make sure that there was in the past an adequate groundwater remediation. It wasn't until the Oak Ridge National Laboratory came along and did a lot of diagnostics that they discovered there was a huge flume of uranium that was coming from the old mill site itself because the NRC never required Atlas to put in monitoring wells between the site itself and the river, all the monitoring wells were around in town. So that is another failure.

The NRC failed to get the amount of surety that was needed to reclaim this site. Atlas was supposed to pay for all of this, not all of us in this room through our taxes, now it is the members of the public. Now that the members of the public are paying for it, I think we should have a little more say-so than what the NRC has to say about it. And I think it is the general consensus of the members of the public that that tailings pile should be moved. Four western governors say it should be moved. Our congressional representatives all say it should be moved. Grand County Council says it should be moved. The State of Utah says it should be moved. Who says it shouldn't be moved? The only person that is going to say it shouldn't be moved is the DOE, and the decision-makers in Washington. Wait a minute, we hired them to take care of this. Our state representatives, DOE, you take care of it. So I think that the DOE should take care of it in the way that the community wants it to be taken care of. That is what congress said.

Response:

Past operational decisions that resulted in the contamination at the Moab site are beyond the scope of this EIS. As a nation, we have inherited a legacy of environmental problems that need to be remedied. DOE has heard the positions of the public, other federal and state agencies, governors, representatives, and senators. DOE will consider all of these positions in its final decision-making.

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Document #82 Comment #1 Commentor: Tanner, Rex—Grand County Council

Well, first I would like to thank Don and Joel and the staff and the DOE for going through this tedious process, but a very much-needed process, and I just want to say thank you for the hard work that I know all of you have put into this, and thank you for taking the time to go through these public hearing processes, it is an important study.

Response:

DOE appreciates the commentor's kind words.
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Document #82 Comment #2 Commentor: Tanner, Rex

But our position is that Grand County Council, representing Grand County and all the citizens here, and I think you can see the room is a lot more packed than what Green River was. I understand there were two people in Green River, I think, but our position is that the only acceptable thing to do here is move it, and cost is not something that we think should be considered, we are in favor of seeing it go to the Klondike area.

Response:

The monetary cost of the alternatives, identified in Section 2.7.3, is only one consideration in selecting the preferred alternative. The commentor's preference for the Klondike Flats site is noted.
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Document #82 Comment #3 Commentor: Tanner, Rex

We have got mixed feelings whether it be slurry or rail. I think those are the two preferred methods over the trucking, though we do recognize the trucking would be a component to either one of those alternatives.

Response:

DOE considered this concern carefully in selecting rail as the preferred transportation mode.
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Document #82 Comment #4 Commentor: Tanner, Rex

For us, I think the big thing is as you listed earlier was the areas of uncertainty. And the fact that you made mention that you wanted to design something if it was to be capped in place or even if it was removed to another location, a facility that would last forever, and we know that that is probably not feasible.

Response:

The EIS acknowledges and characterizes the consequences of uncertainty in Section 2.6.3.
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Document #82 Comment #5 Commentor: Tanner, Rex

But even to meet the requirements of the 200- to 1,000-year range, I think that at its current location, when you look at that last picture that you showed, and you can see the deep river gorge that was cut in the Colorado Plateau, it is very evident that that is one powerful force, that river, what we call the Colorado River. If you look at pictures, the aerial views, you can see that there is vegetation growth right almost up to the edge of the one, I believe the south side of the pile, and I think that also follows the line of the high water mark in 1983, which I believe was 66,000 cubic feet per second flowing down that river. And that really basically was the edge of the pile. And the fact that we have heard several studies come about and brought to light in the last six months or so on this subject, there is some conflicting information from potentially some of the information that is presented in the EIS, and I think that what that indicates to me and to the Grand County Council, is that we are not sure, we are not sure that it would be safe there, we are not -- that level of uncertainty exists, and that in itself is why it needs to be moved.

Response:

DOE's analyses support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. Differing opinions on this conclusion are discussed further in Section 2.6.4 of the EIS. To mitigate potential river migration for the on-site alternative, DOE would include a barrier wall (identified in Figure 2−3 and discussed in Section 2.1.1.1 of the EIS) with riprap sized to withstand the projected maximum velocities cited in the USGS report. Further, in Section 2.6 of the EIS, DOE acknowledged the uncertainties regarding this issue and the potential effect on long-term performance. The EIS also assesses the consequences from flooding (Section 4.1.3.1); this assessment concludes that expected periodic inundation of the pile would not lead to discharges to the river that would be harmful to aquatic life or humans.
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Document #82 Comment #6 Commentor: Tanner, Rex

And I won't take much more time other than to say upriver, we have I believe there are two reservoirs that are connected to this system, and I think that that has to be considered as an additional factor with the loads that are carried in those reservoirs for potential disasters. And I think we all have seen in the last month or two the power of water, what it can do, from the tsunami situation in Indochina, to the floods in California, also even in the St. George area with some of the problems we had over there. So I think you can't, you can't underestimate the power of water, and I don't think that we can say with any predictability that that facility would be safe for a long period of time based on the location. And from that standpoint, our comments and letters will reflect those views.

Response:

See response to comment #5. In addition, the assumed PMF would likely exceed the energies of water released from a dam failure.
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Document #82 Comment #7 Commentor: Tanner, Rex

One last point, I would encourage everybody here to not just stop at this juncture in terms of your comments. I would really like to see you make as much of an effort to contact everybody that is involved with this project, the elected officials, and not just in the State of Utah, but people in California, Nevada and Arizona, they all have a vested interest here.

Response:

Comment noted.
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Document #82 Comment #8 Commentor: Tanner, Rex

And last but not least, this isn't just about Grand County and the 9,000 residents in Grand County, it is about the four or five, 10 million people that are downriver of this project, that if you made a miscalculation, and it did break loose with a high-water event, what would be the long-term effects for the Southwestern United States, and the millions of people involved?

Response:

The design of a disposal cell at the Moab site would include armaments and a riprap wall that would further reduce the likelihood of a catastrophic failure of an on-site disposal cell. Although DOE considers catastrophic failure of an on-site disposal cell extremely unlikely, the potential consequences and risks of such an event are discussed in Section 4.1.17.
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Document #83 Comment #1 Commentor: Sakrison, Dave—City of Moab, Mayor

First of all, I would like to say good evening, and Don, on behalf of the city of Moab welcome, and thank you very much for allowing this group of people, and there is, I am sure there are more out there that would like to comment also, giving them this opportunity to express their views.

This process has been going on for a long time, as we all know, and I am glad we may be seeing the light at the end of the tunnel, hopefully. I promise to keep my remarks brief in order that we may hear from everybody and their concerns. I would like to begin by saying that the city of Moab is in the process of drafting a formal reply, and it will be sent prior to the deadline on February 18th. I would, however, like to voice some of the governing body's general positions and concerns.

Response:

DOE appreciates the continuing involvement of the City of Moab in this decision-making NEPA process.
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Document #83 Comment #2 Commentor: Sakrison, Dave

The city of Moab would like to join in with the State of Utah, California, New Mexico, Arizona, Nevada, Grand County and San Juan County, our congressional delegation, and I am sure I have left out some other organizations or groups, and I apologize for that, but we would like to join with them in asking that the Atlas tailings pile be moved. It is the city's position that there are too many uncertainties, and an inherent amount of risk involved by leaving the tailings in place.

Response:

The commentor's objections to on-site disposal are noted. DOE will consider this comment in its final decision-making.
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Document #83 Comment #3 Commentor: Sakrison, Dave

There are concerns and questions as to the potential for contamination of the Moab aquifer.

Response:

DOE acknowledges the commentor's concern regarding the aquifer and has considered this comment in the identification of active ground water remediation as one of its preferred alternatives.
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Document #83 Comment #4 Commentor: Sakrison, Dave

There are questions and concerns as to what a catastrophic flood event might do to the integrity of the tailings if left in place.

Response:

Side slope armament and a barrier wall included in the design of the on-site alternative would serve to maintain the integrity of the pile during the regulatory time frame of 200 to 1,000 years. The 1984 flood caused no degradation of the structure of the unremediated pile. Even under a highly unlikely catastrophic failure, discharge of 80 percent of the pile into the Colorado River would not extend impacts beyond a few miles downstream of the site (Section 4.1.17). The uncertainties of these conclusions and the resulting consequences are discussed further in Section 2.6 of the EIS.
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Document #83 Comment #5 Commentor: Sakrison, Dave

There are also socioeconomic impacts that we feel have not been adequately addressed.

Response:

DOE is confident that the analyses provided in the EIS will support its decision-making process.
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Document #83 Comment #6 Commentor: Sakrison, Dave

For example, the visual impact as presented in the document on pages 433 and 434, which do not meet BLM regulations.

Response:

The text states that "Neither the strong contrasts anticipated to occur in the short term nor the moderate contrasts anticipated to occur in the long term would be compatible with the Class II objectives [not regulations] that BLM has assigned to the nearby landscapes." DOE is not required to meet the objectives of BLM's visual resource management system on the DOE-owned Moab site.
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Document #83 Comment #7 Commentor: Sakrison, Dave

We feel that there would be a positive economic impact on moving the pile. I said positive economic impact on moving the pile, especially in the visitors' impression on our area.

Response:

As quantified in Section 4.1.14 and elsewhere in the EIS, there would be significant expenditure under all alternatives during remediation. Economic impacts on tourism are difficult to measure. One could argue that Moab has experienced significant growth in the last decade in spite of the existence of the pile and the ongoing debate over its remediation. Regardless of the inability to quantify the long-term cost-benefit of off-site disposal, DOE agrees that off-site disposal would be a net positive impact to the Moab region.
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Document #83 Comment #8 Commentor: Sakrison, Dave

And then there is the potential economic impact, if there were to be a catastrophic event, not only in the mitigation of the event, but in the perception to the rest of the world.

Response:

DOE's analyses support a conclusion that a catastrophic failure is highly unlikely, would not result in the dire consequences suggested by some commentors and the press, and would be mitigated under the on-site disposal alternative by armoring the disposal cell with riprap and constructing a barrier wall between the disposal cell and the river.
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Document #83 Comment #9 Commentor: Sakrison, Dave

These are just a few of our concerns, and as a city, that the city has about leaving the tailings in place.

As to moving the tailings the city's preferred alternative would be the Klondike site. We feel this would be the best alternative, and would mitigate any hauling of any waste and debris through the city of Moab, which we would strongly object to.

Response:

The commentor's concerns regarding potential haul traffic through the City of Moab and preference for the Klondike Flats site are noted.
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Document #83 Comment #10 Commentor: Sakrison, Dave

In closing, we have been looking at this remediation process for a long time, and the only thing that has happened is that the costs have gone up. We need to move it now.

It would be a shame if we capped this in place and found out at a later date that it had to be moved for some reason. What would the cost be then?

Virtually every mill site along any waterway in this country has been moved and remediated. I believe it is in the best interest of not only the citizens of this community, but those living downstream to move these tailings. It is the right thing to do.

Response:

DOE acknowledges the commentor's concerns and will take them into consideration throughout its decision-making process.
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Document #84 Comment #1 Commentor: Russell, Steve

The pile is there because during the cold war our government asked people to go out and search the Four Corners area for uranium for purposes of the cold war, and that was done. A huge frenzy of mining took place and never mind the Cold War aspect of it, what we are left with right now is this pile of tailings on the banks of the Colorado River.

I think that our government has a responsibility now to do the most expeditious, sensible thing in order to remediate what was left there, for their benefit. No one I don't think is going to argue that the pile contains a lot of bad potentially dangerous stuff. And it is on the banks of what really is the heart, the beating heart of the entire Southwest of the United States, the Colorado River. The entire Southwestern United States depends on that river for drinking water, for agricultural water, for life, Phoenix wouldn't exist without it, Las Vegas wouldn't exist without it, we can argue that Los Angeles wouldn't exist without it. The Imperial Valley would not exist without it.

So what should be done with it? We should move it off the river. The cost now, and I will be corrected if I am wrong, is in the neighborhood of 500 million dollars, that is a big number, but not to the U.S. Government.

Response:

DOE acknowledges the commentor's concerns and will take them into consideration throughout its decision-making process.
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Document #84 Comment #2 Commentor: Russell, Steve

We are currently engaged in an action in the Mideast, in Iraq we spent 120 billion dollars there. George Bush has just asked for another 80 billion dollars for that effort. Why are we there? We thought, some people thought that there were weapons of mass destruction that posed a dire threat to the United States and to the world. And so we have gone and we have done what we have done, and we found out that we were wrong, dead wrong. And there is still another 80 billion dollars on the table.

Response:

The war in Iraq is outside the scope of this EIS. However, DOE will consider costs throughout its decision-making process.
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Document #84 Comment #3 Commentor: Russell, Steve

One mile north of here is a clear and present danger to the health and safety of the citizens of this county, and the entire Southwestern United States. It is there, there is no question about it. You can send the inspectors in there and they are going to see it. They are going to know that it is there. And 500 million dollars, although that is a big number, is one-half of one percent of what is being asked for in addition to the 120 to 150 billion that has already gone, and that is in relative terms a drop in the bucket, and I think that our government could find it somewhere.

Response:

DOE is developing comprehensive and detailed budget baselines that will provide the appropriate funding requirements to the Secretary of Energy and Congress to achieve the project reclamation goals in a timely manner.
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Document #84 Comment #4 Commentor: Russell, Steve

Now, this is not DOE's fault, it is nobody's fault, but it is there. And so that is the priorities part of it. Okay. If we can do what we are doing, and spend all of the money to do what we are doing, I don't care how you feel about it, but if we can do that, I think that we can find 500 million dollars to eliminate this clear and present danger to the Southwest of our nation. That was the whole deal about going over in to Iraq, was to protect ourselves. Okay, we are protecting ourselves here for pennies on the dollar. So that is the priorities part, and now the common sense part.

Response:

See responses to comments #2 and #3.
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Document #84 Comment #5 Commentor: Russell, Steve

It is there. It would be the height of hubris for us to sit here and say that for all time and eternity, let alone 200 to 1,000 years, that nothing bad is going to happen on this major, giant river that is fed by the entire Rocky Mountains of the west, the Wasatch, the Uintas, it is impossible, it would be impossible to say that nothing bad could happen to it. And so the only reasonable thing to do is to move it. Klondike I think is the way to go, rail. I don't know, I frankly don't know anything about the Cresent Junction site, but it is farther off and so Klondike I think is safe and secure, so I think that would probably be better.

Response:

The commentor's concern regarding the potential for river flooding and migration to compromise the long-term stability of the disposal cell is noted. This topic is addressed in Sections 2.6.3 and 2.6.4. The impact of catastrophic failure, though deemed extremely unlikely under the on-site alternative, is addressed in Section 4.1.17. The commentor's preference for the Klondike Flats site is also noted.
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Document #84 Comment #6 Commentor: Russell, Steve

I don't think White Mesa is a good idea, and I especially don't think that slurrying it to White Mesa is a good idea. Think of all the water, that is a lot of water. Then what are you going to do with it after it has gone down there, put it in the San Juan River? And trucking it down there isn't the way either.

Response:

Section 4.1.12 states that the White Mesa Mill alternative would require approximately 70 acre-feet per year of nonpotable water, approximately 3 percent of the water rights DOE currently possesses (3 cfs of consumptive water rights and 3 cfs of non-consumptive water rights). Section 2.2.4 states that 80 percent of the slurry water would be recycled for reuse in the slurry pipeline system and that approximately 400 gallons per minute (gpm) would be required for makeup water.

The impacts associated with the truck transportation alternative are identified in Section 4.4.15.
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Document #85 Comment #1 Commentor: Bodner, David

When the National Academy of Science was here I requested that a study of the sand bars on the Colorado below the pile be made due to the number of people who raft the Colorado every year. The sand bars are eroded and rebuilt every spring by the high water that passes by. People camp, eat, play and sleep on the bars. Dishes are washed using river water. Some people still use the river water to make coffee.

What are the potential impacts to this 6 or 7,000 people who recreate on the river? What are the potential impacts to the river guides who spend weeks every summer working on the river? What are the potential dangers to the people who play, camp, swim, water-ski and fish on reservoir Powell? What are the dangers to the millions of people downstream who drink the water or irrigate with it?

Response:

The health impacts from both radiological and nonradiological contaminant exposures of workers and the public (including recreational users) are analyzed for each alternative in Sections 4.1.15, 4.1.17, 4.2.15, 4.3.15, and 4.4.15, and for the No Action alternative in Section 4.6.15.

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Document #85 Comment #2 Commentor: Bodner, David

I would like to give an example of the problem that exists in attempting to mitigate the danger by leaving the piles in place.

From 1976 to 1983, that is seven years, McDougal Oil delivered four super tankers of sulfuric acid per day to Atlas Minerals. Based on a 300-day year and 50 tons of acid per truck, that comes out to 60,000 tons per year, 420,000 tons over the seven-year period. The person that gave me this information told me this was a conservative estimate, that they probably operated more than 300 days a year. No acid was hauled away to be recycled, not one drop.

When Atlas was finished with the acid it went into the pile. The same thing happened to the caustic soda and every other chemical that was delivered to Atlas.

There is no option other than moving this mess away from the river. If the pile could be riprapped so it could not be swept away by a flood flow from the river, that would still not prevent the groundwater from entering and dissolving or leaching contaminants back into the river when the water subsides. There is evidence of flood flows in excess of 100,000 cubic feet per second, and more, have come down the river corridor, and contrary to your report, the main force of these flows will go toward the pile, and start eating it away from the southwest corner. That corner is where the parts of the buildings that were too contaminated to be recycled are buried.

Please make the right decision and move it away from the river.

Response:

DOE acknowledges the commentor's concern regarding the chemical usage at the former mill site and recognizes past production as the source of the current ground water contamination that has been modeled and assessed in the EIS. For the on-site alternative, DOE's conceptual design includes riprap armament on the pile's side slopes and a barrier wall to mitigate against river encroachment during the regulatory performance period. DOE has also analyzed the impacts from recurring flooding of an on-site disposal cell (Section 4.1.3.1).
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Document #86 Comment #1 Commentor: Seal, Franklin

I have lived in Moab 12 and a half years now, and for four years I worked at the local paper here, and so I had an opportunity to cover this story in detail more times than I care to remember. And I don't know that I can really add a lot of substantive comments beyond what has already been made, but I would like to say just observing the fact that this draft EIS came out without a preferred alternative was quite interesting, and I think that despite the preponderance of science that points to this being a clear risk, that the draft EIS seems to be leaning and setting the stage for a decision which perhaps has already been made in headquarters, to leave the pile in place, and I think that ultimately this kind of a situation is decided based on politics, but that is the reality that this community and all the communities downstream of this pile face. And that is no fault of yours (indicating), that is just the way the system is. And I think that we need to work very hard over the next month and a half until this decision is announced finally, to see if we can't change some minds in D.C. I think science is a great thing, but having watched the current administration over the last four years, I don't think that they give a whole lot of credibility to science, and I don't think they really care that much about science.

Response:

The EIS provides an objective and comparable evaluation of all alternatives. As stated throughout this process, DOE was committed to reviewing the analyses provided in the EIS and public and agency comments on those analyses before identifying its preferred alternatives. Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE will continue to consider this information in its final decision-making.
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Document #86 Comment #2 Commentor: Seal, Franklin

I don't think it is a question of money, I think it is a question of who is on our side and who is speaking out.

Response:

DOE acknowledges that cost is one of the factors that will be considered in its final decision-making, and DOE values all public comment on this decision-making process.
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Document #86 Comment #3 Commentor: Seal, Franklin

As to what I personally think, we definitely should move the pile. We have got a rail line there, why build another road, if you have already got one there that is already designed to hold lots of heavy traffic, and it goes right to the Klondike site, which is already being used as a disposal site, so let's put it there.

Response:

Both rail haul and truck haul transportation alternatives have been evaluated for the Klondike Flats site (Section 2.2.4 of the EIS). The commentor's preference for the Klondike Flats site is also noted.
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Document #87 Comment #1 Commentor: Bliss, Eleanor

The citizens of Moab have been actively trying to get the Atlas tailings moved for more than 12 years. We were assured by Bill Richardson in November '99 that the tailings would be moved. There was gratitude by the community that we finally had been heard. That day we felt it was possible for the government to do the right thing, for Moab, for the millions of people downstream from the pile and to the future. It was celebratory.

Response:

This EIS is a required step in decision-making by a federal agency such as DOE. Unfortunately, an EIS had not been completed to support the 1999 announcement. Part of the EIS process is the opportunity for public input into the process. DOE will give careful consideration to public sentiment in its final decision-making.

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Document #87 Comment #2 Commentor: Bliss, Eleanor

Here we stand five years since, rehashing and talking about wether we should move the pile. The Floyd Spence Act clearly stated to transfer the ownership of the pile from the NRC to the DOE, that the piled would be moved. That wasn't something on the table. That statement has somehow quietly been dismissed in this EIS.

Response:

The Floyd D. Spence National Defense Authorization Act for Fiscal Year (FY) 2001 states "The Secretary of Energy shall enter into arrangements with the National Academy of Sciences to obtain the technical advice, assistance, and recommendations of the National Academy of Sciences in objectively evaluating the costs, benefits, and risks associated with *various remediation alternatives, including* removal or treatment of radioactive or other hazardous materials at the site…" [emphasis added]. Consequently, the Department has complied with the Floyd D. Spence Act by evaluating various remediation alternatives, including both on-site and off-site disposal.

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Document #87 Comment #3 Commentor: Bliss, Eleanor

How can we possibly be studying cleaning up a radioactive pile on line beside the drinking water of 26 million people, even laughingly entertain a notion of covering in place. Please tell me this is a joke.

Currently the groundwater leaking into the river in excess of 100,000 gallons per day is so toxic that minnows die within a minute of being in contact with the water, which is very startling. Ken Solomon of the University of Utah informs us the groundwater is migrating over into the Matheson Wetlands. How long will it take before it shows up in the wells of the residents of Moab?

It is already obviously contaminating fish, birds, and whomever eats those.

Response:

Section 3.1.7.3 characterizes the very limited area immediately adjacent to the Moab site in which contaminants escaping from the site can be detected and have the potential to impact aquatic organisms. However, the proposed ground water remediation action (Section 2.3) would intercept the ground water source of this surface water contamination within 5 to 10 years of implementation and would continue for 80 years until natural processes reduced the concentrations of contaminants to levels below those toxic to aquatic organisms and humans. The USF&WS has granted a take of protected aquatic species for 10 years in its Biological Opinion (Appendix A3 of the EIS).

DOE disagrees with the University of Utah's (Gardner and Solomon [2003]) assertion that contaminated ground water (ammonia and uranium) is reaching the Matheson Wetlands Preserve. This issue is discussed further in Section 2.6.4 of the EIS.
==

Document #87 Comment #4 Commentor: Bliss, Eleanor

Dr. John Dohrenwend, I will kill that name, who has been studying the path of the Colorado, was very informative the other night, give thanks to him, studying the Colorado and coming up with an entirely different scenario and conclusion about where the Colorado will be migrating, which is toward the pile and not away, as DEIS states, which in my mind doesn't really matter one way or another. He showed us amazing pictures of flooding in 1917, the 76,000 c.f.s., in which the river obviously was already sweeping through where the Atlas tailings pile stands now. I can't imagine, and in 1884, it was 125,000 c.f.s., amazing, just too boggling to imagine where the water would be on the pile or above the pile. It is not a matter of if, it is a matter of when. We have no idea when that, you know, when the flooding will take place, but I do hope, I hope that we can speedily remove this pile. It is a horror show to think if we actually had a flood year and this thing got away from us before we have had a chance to move it.

I think listening to John I realize for the first time, really, when I saw the pictures, that floods would sweep right in to the Moab valley, it would be circulating all that toxic material here going round and round in circles, because it is an eddy, and that is just the beginning of the horrors, because then it would dry up eventually, and as it dried up it would leave all that toxic stuff to blow as it evaporated all over, and of course sweep downriver. There are 26 million people downstream from us that depend on this water.

Response:

Side slope armament and a barrier wall included in the design of the on-site alternative would serve to maintain the integrity of the pile during the regulatory time frame of 200 to 1,000 years. The 1984 flood caused no degradation of the structure of the un-remediated pile. Section 4.1.3.1 characterizes the predicted post-flooding discharges from the pile, which would not be expected to result in concentrations harmful to aquatic organisms or humans. Even under a highly unlikely catastrophic failure, discharge of 80 percent of the pile into the Colorado River would not extend impacts beyond a few miles downstream of the site (Section 4.1.17). The uncertainties of these conclusions and the resulting consequences are discussed further in Section 2.6 of the EIS.
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Document #87 Comment #5 Commentor: Bliss, Eleanor

We have been shown when some of the rocket fuel got into the water, that it is now in all of our, in all of our produce in large amounts, surprising, quick returning back into the shelves of our supermarket.

Response:

While there is no source of rocket fuel in the Moab mill tailings or vicinity properties, DOE assumes that the commentor is concerned that contaminants at the Moab site have the potential to find their way into the food chain if not properly remediated. As characterized in the EIS, contamination from the site in its pre-remediation state cannot be measured above background levels a few thousand feet downstream from the site. And even under a highly improbable catastrophic failure (Section 4.1.17 of the EIS), it is unlikely that such a scenario could occur.
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Document #87 Comment #6 Commentor: Bliss, Eleanor

And we are just talking about 200 years, 1,000 years, which doesn't even begin to break down this toxic stuff. We are talking about in 1,000 years it will only break down by 1 percent.

Anyway, it is a no-brainer, it should be moved, it should be moved away from the river. I would hope it gets moved to Klondike.

Response:

The commentor's characterization that little decrease of the tailing's radioactivity occurs over the minimum regulatory time frame of 200 to 1,000 years is essentially correct. The commentor's preference that the tailings be relocated to the Klondike Flats site is also noted.
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Document #88 Comment #1 Commentor: Hazen, Gary

I am a concerned citizen. I will give my comments as well. Part of the DOE's mission is to ensure the environmental cleanup of the National Nuclear Weapons Complex by providing a responsible resolution for the permanent disposal of the nation's radioactive waste. The DOE capping the Atlas tailings pile in place is not providing a permanent disposal of radioactive waste. 76 percent of Grand County sales tax revenues is from tourism. Lake Powell's recreation revenues exceeds 340 million dollars a year. The probable possibilities of floods, earthquakes, pile failures, major degradation of 25 million Americans' drinking water, devastations of the local economies, lost services, ruined communities and shattered lives are all unacceptable to the American public.

The economic loss of the Atlas pile failure will truly outstrip the cost of a couple moves of the tailings to the alternative plateau Klondike site.

Response:

Section 2.6.3 identifies the uncertainties regarding the EIS alternatives. Section 2.6.4 identifies responsible opposing views to the EIS's characterization of the conditions and impacts associated with the alternatives. Section 4.1.17 identifies the impacts associated with the highly unlikely event of catastrophic disposal cell failure and release into the river. Section 2.7.3 presents the costs associated with the alternatives. However, given the engineering controls for the on-site disposal alternative and the extremely low likelihood of this failure, the costs of remedial action should such event occur have not been quantified.

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Document #89 Comment #1 Commentor: Weisheit, John

The cooperating agencies have neglected the Bureau of Reclamation and because of the dams upstream in the Wayne Aspinall unit and downstream in Lake Powell, are managed by the Bureau of Reclamation. The Bureau of Reclamation has dam site engineers, and they also have hydrologists, and I think that their data would be very useful to this particular EIS. So I would request that there be a dialogue with the Bureau of Reclamation to discuss the potentials of the dams upstream, because the dams upstream, including Lake Powell, are not going to last 200 to 1,000 years. And so the older they get the more potential there is for these dams to fail, and for this waste to end up in Lake Powell. And so it would be probably very beneficial to find out from the Bureau of Reclamation how stable their dams are upstream and so on.

Response:

DOE has not consulted with the Bureau of Reclamation regarding the stability of their dams upstream but has consulted with Department of the Interior cooperating agencies, such as the NPS, BLM, and USF&WS. DOE did not analyze specifically the sudden release of water from the dams upstream of the Moab site, but did analyze the impact of a catastrophic flood event (300,000 cfs, which is the NRC-specified PMF) and determined that it would have serious adverse impacts on the riparian plant and animal life and would affect the health and safety of residents along the river and of river guides. The impacts of catastrophic failure are assessed in Section 4.1.17 of the EIS, and the effects of periodic flooding are addressed in Section 4.1.3.1.
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Document #90 Comment #1 Commentor: Hancock, Karla

I am very concerned about the leaching of tailings materials into the Colorado River, but I am even more concerned about the possibility of local contamination in the event of a major flood, as well as the present and future effect of the presence of the pile on our groundwater supplies.

Response:

In the EIS, DOE acknowledges the potential for the pile to be inundated during floods. If the on-site disposal alternative were selected in the Record of Decision, the side slopes would be protected by riprap and the toe of the pile would be protected by an engineered barrier to river migration, as described in the EIS. While additional ground water contaminants would likely be released to the environment during 100-year or greater floods, the resulting impacts to human health and the environment would not be catastrophic and have been discussed in the EIS (Sections 4.1.3.1 and 4.1.17).
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Document #90 Comment #2 Commentor: Hancock, Karla

I think capping the pile would simply be applying a Band-Aid where major surgery is needed. I urge you to move the pile to a safer location. I too would prefer Klondike and think the use of the rail would be most logical.

Response:

The commentor's preference for relocating the tailings pile to the Klondike Flats site is noted.
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Document #91 Comment #1 Commentor: Inskip, Eleanor

I always thought that NEPA stood for the Environmental Protection Act. I was really surprised to see that it was the Policy Act when you put it up on the board. So that was kind of an amazing thing. And I was really pleased to see you. I listened to you on the radio when you went to the city and talked about what you are doing with spraying water up in the air last fall, and I thought that is quite interesting, and it is always fun to see somebody's face after you listen to them for awhile, so it was kind of fun.

Response:

DOE appreciates the commentor's participation.
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Document #91 Comment #2 Commentor: Inskip, Eleanor

I also would like to say, as a private citizen, I would like to say that the pile should be moved. I think the least amount of exposure should be for everyone and everything, should be a high priority, so moving it the shortest distance. And I think that would probably be a way to go, the way to go.

Response:

The commentor's preference for relocating the tailings pile and for minimizing the exposure to the public and the environment is noted. As identified in Chapter 2.0 of the EIS, the Klondike Flats site is the closest off-site alternative location for disposal. Human health and the impacts of exposure to radiation (latent cancer fatalities) are identified for each alternative in the human health sections of Chapter 4 (4.1.15, 4.2.15, 4.3.14, 4.4.15, and 4.6.15).
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Document #91 Comment #3 Commentor: Inskip, Eleanor

And when you put up the areas of uncertainty, those words up there, I was looking at that, and, you know, I have been, I have been in Moab longer, since 1976, and when we went through the shall we bury nuclear waste in Canyonlands. When you start thinking about the amount of time that is involved, and truly 200 to 1,000 years is nothing, when you are talking -- last night I heard myself say tens of hundreds of millions of years, and I really don't know what, you know, what the time frame is, it is like geologic time and it is kind of -- and I don't even know how you wrap your head around it.

Response:

The EIS considers not only the 200- to 1,000-year time frame mandated under UMTRCA, but also, when appropriate, longer geologic time frames.
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Document #91 Comment #4 Commentor: Inskip, Eleanor

But one of the proposals that was made at that point in time was to have an atomic priests and priestesses, and it does sound kind of funny on the surface, and I actually tried to get some people to dress up in sheets and come tonight dressed as atomic priests and priestesses, but they wouldn't do it.

Response:

Comment noted.
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Document #91 Comment #5 Commentor: Inskip, Eleanor

The whole point of it really though was that it needs to be monitored, and it needs to be monitored ongoing. And I don't think we should be burying it. I know that is not in your alternatives there, but I really think we should be able to ongoingly keep track of what is going on with this. And putting it under the ground so it can be forgotten and we can walk away from it, I don't think that is a very good idea.

Response:

Many years of analysis and debate resulted in the regulations that require isolation of mill tailings from the environment by entombment under a designed cover. Failure to do so for the Moab tailings could result in the impacts characterized under the No Action alternative in the EIS. Once the site is remediated, DOE's Office of Legacy Management has the long-term responsibility to monitor all uranium mill tailings sites (along with other closed DOE sites), provide assurances that they are performing as designed, and do whatever routine maintenance might be required to provide such assurances forever.
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Document #91 Comment #6 Commentor: Inskip, Eleanor

I do think it should be moved, it is very dangerous. It has been a long time since anybody drank from the Colorado River if they were paying attention, uranium, et cetera does not settle out, and you can't clean it out with your little filters.

Response:

DOE acknowledges the commentor's concern regarding the uranium mill tailings pile and has considered this comment in identifying off-site disposal and active ground water remediation as its preferred alternatives.
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Document #91 Comment #7 Commentor: Inskip, Eleanor

So I would say, and I don't know how you are going to get it there, rail, truck, slurry sounds really sloppy, you know, so I don't know about that, but I would very much ask that it be moved.

Response:

All transportation modes and their associated impacts are assessed in the EIS and will be considered by DOE in its final decision-making.
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Document #92 Comment #1 Commentor: Vaughn, Rita

I just want to say I want the tailings moved, and Klondike Bluffs, Crescent Junction would be my two best places, by rail. I hate doing this kind of stuff, so there you go.

Response:

The commentor's preference for relocating the tailings pile to either the Crescent Junction site or the Klondike Flats site is noted.
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Document #93 Comment #1 Commentor: Fitzburgh, Mary Beth

Just very briefly I would like to see the tailings moved to Klondike to Crescent Junction by rail for reasons that have already been expressed.

Response:

The commentor's preference for relocating the tailings pile to the Klondike Flats site by rail is noted.

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Document #94 Comment #1 Commentor: Harrison, Bruce

A couple of things. One thing, I lived in the Black Hills of South Dakota in 1972. It dumped seven inches of rain in three hours, and killed 204 people. So you don’t know what Mother Nature can do. I have seen hail softball size at 90 miles an hour in Nebraska. If man is messing with the planet you just don’t know to what level things are going to change.

Response:

DOE acknowledges the commentor’s concern regarding the uncertainties related to the unpredictable forces of Mother Nature. DOE has summarized potential impacts in the EIS in terms of flooding (Section 4.1.3.1), catastrophic failure (Section 4.1.17), and subsidence (Section 4.1.1.1).
===

Document #94 Comment #2 Commentor: Harrison, Bruce

It used to be that the tribes wouldn’t make a decision to move the buffalo hunt if it affected seven generations. Now we do things that have much greater consequences than just seven generations, thousands and thousands of years. So we have to look way beyond seven generations.

It seems like, and I don’t know if it is just me, but it seems like there is this consciousness near Washington that only cares about the distance of their lifetime, if I am out of here, I don’t care. There is no consideration for grandchildren, future generations. It seems like we are on a downhill spiral and everybody seems to think that there is no pulling out of it, what the heck, get what you can and get out.

Response:

Where relevant to decision-making, the analyses in the EIS look thousands of years into the future. Examples: the travel times to ground water under the off-site alternatives range from a few thousand years to over 100,000 years; subsidence of the Paradox salt basin will cause an on-site pile to come into contact with the ground water in 7,000 to 10,000 years; and the modeling of the Moab site ground water has been projected to 1,000 years.
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Document #94 Comment #3 Commentor: Harrison, Bruce

It is hard for common citizens, working class citizens to keep educated. I want to thank John, Professor John, that helped us so much in learning the facts that it seems like could be slid under the rug to us.

Now, I don't know about you, but I don't get away at home at sweeping things under the rug. But I notice a bulge under the carpet in Washington. It is getting big enough for all of us to see it. We need this to be taken care of. I don't know what you can do to save it. You make a wage, they sent you here, and said, okay, all of these people are going to say this, keep a peaceful time, come back to us and we are going to do this other thing.

I don't know what you can say to change their minds or to let them know how much it means to us to have this right. But I hope you do that. I hope you can't sleep at night if you can't do that.

Response:

DOE has conducted a totally open and thorough assessment of the potential impacts that might result from a range of reasonable alternatives in this EIS and has not "swept anything under the rug." DOE acknowledges the commentor's concerns and will consider this comment in its decision-making.
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Document #94 Comment #4 Commentor: Harrison, Bruce

Let's see if I have said everything.

Does the pile belong to you now?

MR. METZLER: It does. Not me personally. I didn't have enough money to buy it. DOE took it.

MR. HARRISON: For the 15 years that I lived here nothing has been done, and I have come to a lot of these meetings. We filled Star Hall one year. The NRC was there, they built us a book that was an inch and a half thick and it cost us 200, $300,000. Are you using that at all?

MR. METZLER: We try to build off of other information.

MR. HARRISON: That is good. How much will this cost us?

MR. METZLER: It will be more than a million dollars.

Response:

The Moab mill tailings are the responsibility of DOE. As applicable, the analyses generated in NRC's EIS have been used by DOE in this EIS. This EIS will cost slightly more than $1 million, and the costs of the alternatives analyzed are provided in Section 4.1.14.
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Document #94 Comment #5 Commentor: Harrison, Bruce

And still on a windy day, it is your pile now, on a windy day that dust is blowing through this valley 12 years later. I would like to see you keep it wet on windy days. It belongs to you, I would like you to start taking care of the pile now while this decision is being made.

Response:

DOE recognizes the importance of controlling fugitive dust emissions from the Moab tailings pile. In accordance with Utah State Air Quality regulations (Utah Administrative Code, Section R307-205, Emission Standards: Fugitive Emissions and Fugitive Dust), DOE has prepared the Fugitive Dust Control Plan for the Moab, Utah, UMTRA Project Site (DOE 2002a). This plan outlines the engineering, procedural, and administrative controls that DOE has implemented at the Moab site. In accordance with the plan, DOE attempts to maintain all visible dust emissions to 20-percent opacity (the state standard for visible emissions) or less. This is accomplished primarily by implementing various dust suppression controls such as using water trucks to apply water to on-site traffic areas, spraying soil stabilizers such as magnesium chloride to create a "crust" on the exposed soil surfaces, restricting vehicle traffic to designated routes, and limiting vehicle speed.

The problem of fugitive dust is not limited to the Moab mill tailings site; dust emissions and suspended airborne particulate matter are a region-wide problem that has been exacerbated by several years of ongoing drought conditions in the Four Corners area. The Utah Department of Transportation (UDOT) and BLM are studying the problem, including motorist safety impacts associated with severe dust storms that have been occurring along SR-191 and the I-70 corridor, over the past several years. DOE also recognizes that dust emissions resulting from any of its activities must be controlled to the greatest extent practical.

Off-site radioparticulate monitoring data indicate that any dust leaving the Moab site boundary does not exceed thresholds established for public exposures to the radioisotopes that are commonly associated with uranium mill tailings. In other words, the material that does occasionally become airborne and is visible at the mill site boundary consists primarily of fine soils (sand) and other surface materials, not mill tailings.
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Document #94 Comment #6   Commentor: Harrison, Bruce

Forever. That is a long time. You know, they always put costs at the bottom. And oh, of course, then there is cost. But how come I always feel like when it gives to Washington that is at the top.

Response:

DOE acknowledges that cost is one of the factors that will be considered in making its final decision, but it is not the sole or deciding factor. Based on the analyses in the EIS, the estimated lifetime cost of transporting the Moab mill tailings off-site would be approximately $160 million to $300 million more than the on-site disposal alternative (see Section 2.7.3 and Table 2−35 of the EIS). However, DOE weighed the additional costs of off-site disposal not only against risks, but also against the uncertainties that attend the on-site disposal alternative.
==

Document #95 Comment #1 Commentor: Carlson, Jim

In the Draft EIS there is a part that talks about river migration and flooding, and the way I interpreted it that the outcome would be unpredictable if this happened with the big flood. That along with my mathematics, looking at some statistics, we are well past the 100-year rain. I think the last 100-year rain was like 130 years ago or something. So it is coming.

Response:

DOE agrees that a 100-year flood will eventually occur and has considered this by incorporating side slope armament and a barrier wall in the design of the on-site disposal alternative. These engineered features would serve to maintain the integrity of the disposal cell during such an event. Additionally, the post-flooding impacts of the on-site alternative are assessed in Section 4.1.3.1.

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Document #95 Comment #2 Commentor: Carlson, Jim

The other thing, I just think that the whole thing looks like we are playing a great big game of Russian roulette. We keep rolling the dice, and we keep going and going, and if you look at the different things that have happened just in the last six months in the world, we are running out of time, we are going to have to quit talking and start doing. I agree with most of the comments that have been made about to move it north and to move it now. So anything we can do to get that done, I would appreciate it.

Response:

Section 2.6 identifies the uncertainties, noted by the commentor, associated with the various alternatives. The commentor's preference for relocating the tailings pile to either the Crescent Junction site or the Klondike Flats site is noted.

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Document #96 Comment #1 Commentor: Campbell, Jack

Just a very brief comment. I am speaking tonight as President of the Castle Valley River Ranchos Property Owner's Association. I realize that is a very impressive title, but the Castle Valley Property Owner's Association actually represents all of the developed properties in the incorporated municipality of Castle Valley, which I believe is actually the second largest municipality in Grand County.

And the very simple comment that I want to make is just to encourage you to move the pile by rail to either Klondike or Crescent Junction.

Response:

Comment noted.
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Document #97 Comment #1 Commentor: Hackley, Pam

And so my comments are after reading what I could of the EIS so far is to move the tailings out of the floodplain for all of the reasons that were given prior to my testimony. And it seems like the Klondike Flats location is the most reasonable, although I am not sure that you have done all of the studies necessary to determine that at this point. And I would hope that, assuming that Washington people make the decision to move the tailings away because so many people and so many agencies and states are going in that direction, that you would keep us informed and involve the communities as to exactly how you would do this remediation off-site.

Response:

The commentor's preference for relocating the tailings pile to the Klondike Flats site is noted. If selected, additional studies of the Klondike Flats alternative or other off-site alternative may be undertaken to confirm a site's suitability for long-term disposal of the tailings and associated wastes.
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Document #98 Comment #1 Commentor: Lippman, Bob—Castle Valley Town Council

I would like to say that tonight Castle Valley in a historic showing of solidarity with the Grand County Council overwhelmingly favors the expeditious moving of the Atlas pile north to a stable, engineered, prepared site, probably by rail, considering that again water is messy, water rights are very precious in the Colorado River, and very contentious, and contaminated water would have to be dealt with in a slurry line.

Response:

The commentor's preference for relocating the tailings pile to either the Crescent Junction site or the Klondike Flats site by rail is noted.
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Document #98 Comment #2 Commentor: Lippman, Bob

I would also like to say that what we are hearing today, I think from everybody in the area, is again another chapter in the emperor wears no clothes. This matter should have been remedied decades ago, as we have heard. Every month that we wait or delay increases the costs exponentially of remediation, and studying the matter endlessly will not change the most basic observations and essential conclusions that are to be drawn.

Response:

DOE has endeavored to manage the site responsibly since it assumed control over the site and to promptly identify the appropriate remedial action alternative in compliance with NEPA.
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Document #98 Comment #3 Commentor: Lippman, Bob

The placement of the tailings have permissively violated a myriad of federal pollution control laws, going back to the 19th century, and into the modern era of pollution regulation, along with defined common sense. The impacts are not limited to local effects, as we have heard, but extend regionally and downstream, potentially affecting tens of millions of Colorado River water users, meaning culinary uses, agricultural, and we are looking at the produce, four seasons breadbasket of the United States, and I shouldn't have used the word bread, but produce basket of the U.S., and as we have heard, recreational use.

Response:

The EIS quantifies the range of potential impacts described by the commentor. After considering those impacts and others, DOE has identified off-site disposal and active ground water remediation as its preferred alternatives. This comment, as well as all the comments in this document, will be further considered as DOE continues its decision-making process.
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Document #98 Comment #4 Commentor: Lippman, Bob

And there are also implications for international and treaty matters downstream, as well as ecological matters involving everything from sediment and beaches, to the now unproductive delta of the Colorado River.

Response:

The analyses in the EIS demonstrate that even under current, unremediated conditions, the effects of site contamination are localized (Section 3.1.7.3 of the EIS). The analyses also support the conclusion that even under a highly unlikely catastrophic failure of an on-site disposal cell, discharge of 80 percent of the pile into the Colorado River would not extend impacts beyond a few miles downstream of the site (Section 4.1.17).
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Document #98 Comment #5 Commentor: Lippman, Bob

There is a larger responsibility here, and I think everybody in this room recognizes that. Long-term containment of the tailings is impossible, in the present floodplain of an active hydrological and geological system.

Response:

The Department agrees that at some point in the future, especially considering geologic time, the river will cross the Moab site. DOE's analyses conclude that engineering controls can be used to resolve this issue for the near term (200 to 1,000 years). If on-site disposal were selected as DOE's final decision, the disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell. Further discussion of the differing opinions over river migration is included in Section 2.6.4.
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Document #98 Comment #6 Commentor: Lippman, Bob

Capping the tailings in place will do nothing to remediate the groundwater and surface flow problem.

Response:

Results of DOE's contaminant transport and ground water flow computer modeling indicate that if the pile were relocated, it would take approximately 75 years for the ground water to passively clean itself to levels that would be protective in the adjacent surface waters. If the pile were stabilized in place, it would take 5 years longer, or approximately 80 years, to reach the same level of protection. In the meantime, the Department would perform ground water remediation activities to maintain protective levels in the river until the 75- to 80-year period is reached (Section 2.3 of the EIS).
==

Document #98 Comment #7 Commentor: Lippman, Bob

The no action alternative will further allow both groundwater and airborne particulate and radon impacts to be exposed to the public.

Response:

The commentor's assessment of the impacts under the No Action alternative is consistent with the information presented in Section 4.6 of the EIS.
==

Document #98 Comment #8 Commentor: Lippman, Bob

Slurrying does again raise questions about water both before and after the remediation.

Response:

A considerable amount of water would be required for the slurry option. The impacts of its use and ultimate disposal are evaluated in the EIS.
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Document #98 Comment #9 Commentor: Lippman, Bob

The only rational and justifiable option is again move the tailings to a stable engineered site by rail.

Response:

Comment noted.
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Document #98 Comment #10 Commentor: Lippman, Bob

And I would like to add, reject the White Mesa slurry alternative due to transferred impacts upon local native American communities, and sovereign trust lands, and this also raises issues of environmental justice.

Response:

This commentor's view on the White Mesa Mill slurry alternative is noted. In Section 4.4.18, Environmental Justice, the EIS clearly states that "Disproportionate adverse impacts to minority and low-income populations would occur under this [the White Mesa Mill site] alternative as a result of unavoidable adverse impacts on potential traditional cultural properties located on and near the White Mesa Mill site, the proposed White Mesa Mill pipeline route, White Mesa Mill borrow area, and Blanding borrow area (see Sections 4.4.9 and 4.5)."
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Document #98 Comment #11 Commentor: Lippman, Bob

In regard to my first comment tonight, I would like to say that I think this issue of remediation of Atlas could really act as a focus to bring our communities together in an unprecedented way, and start to really look at sustainability and appropriateness of human activity in the Moab region, and work together toward those ends and measure our conduct by those ends.

I would urge local governments to act now to prevent the next uranium rush, which is just around the corner. Three more mines have opened in the Paradox area east of here, and if we prepare now and think and plan about this in a sustainable way we won't be here 20 years from today looking at how to remediate another pile.

Response:

Public participation has been an important part of DOE's decision process. Future uranium mining is outside the scope of this EIS.
==

Document #99 Comment #1 Commentor: Angel, Bradley

And for all those reasons, we support all of the folks who have spoken tonight calling for the immediate, prompt and safe removal of the tailings and the toxic waste from the banks of the Colorado River.

Response:

DOE has considered public input throughout the preparation of the EIS. This input has been instrumental in the identification of off-site disposal at Crescent Junction using rail and active ground water remediation as the preferred alternatives in this EIS and will continue to be considered as DOE finalizes its decision.
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Document #99 Comment #2 Commentor: Angel, Bradley

But I also want to focus my comments tonight on a related issue that goes to one of these supposedly reasonable alternatives being considered.

You know, somebody already mentioned this, and as we all know our country is at war overseas. Our citizens are dying and killing supposedly to spread democracy and justice. Unfortunately, the Department of Energy in this process has violated the very principles of democracy and justice, and I am going to document how that is.

Number one, when this process started back in terms of the Draft EIS process on December 20, 2002, the DOE put out a Federal Register Notice. Those documents completely omitted the existence of the White Mesa Ute community. The map distributed by DOE at that time completely omitted the existence of the White Mesa Ute community. It had East Carbon, Crescent Junction, Moab, Blanding, but funny how White Mesa just wasn’t there.

On January 22nd and 23rd the DOE had scoping meetings, I attended three of those, I believe, and still on the big map on the wall White Mesa did not exist, according to the reality presented by the Department of Energy. And they got an earful about that from Tribal members and other members of the public.

Response:

At the 2003 scoping meetings, DOE acknowledged and apologized for the omission of White Mesa on the figures used during public scoping. All relevant figures and maps generated since scoping that show the White Mesa Mill site also depict the White Mesa Ute community and Ute Mountain Indian Reservation. See Figures 2−2, 3−38, and 3−40 in the EIS.
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Document #99 Comment #3 Commentor: Angel, Bradley

On September 14, 2003, here in Moab, and not on the Ute Reservation, but here in Moab the DOE held what they called the Tribal consultation, and myself and several other other Moab residents joined Tribal members from the White Mesa Ute community, and the Ute Mountain Ute Tribe, and other Ute Tribes at that meeting. And it was an incredible meeting, and the Tribal governments themselves, along with the Tribal members, made it totally clear that the law requires not just consultation, but meaningful consultation. That sacred sites that are present at White Mesa and are abundant there need by law, and by right, to be protected. And they demanded that White Mesa be excluded just as the DOE had just properly excluded East Carbon and Green River. I am really glad that East Carbon was excluded as a site. Those people get dumped on already too much.

Response:

DOE believes it has been conscientious in contacting and meeting with as many tribal entities as possible to listen to concerns and receive input on DOE's proposals. In April 2003, DOE initiated the consultation process by notifying potentially interested stakeholders that DOE was preparing a draft EIS. A total of 38 representatives from 14 Native American tribes and the Navajo Utah Commission were contacted by mail and telephone. To date, the Ute Mountain Ute Tribe (including White Mesa Ute Tribe), Southern Ute Indian Tribe, Uintah-Ouray Ute Tribe, Navajo Nation (including Aneth Chapter, Red Mesa Chapter, and Oljato Chapter), Navajo Utah Commission, and Hopi Tribe have expressed interest in or concerns with DOE's proposed alternatives. DOE has personally met with representatives of all the concerned groups. DOE's subcontracted professional ethnographer has also met on a number of occasions with tribal representatives. The Ute Mountain Ute Tribe is a cooperating agency on the EIS. DOE takes its tribal consultation responsibilities seriously and plans to continue to meet with interested tribal representatives.

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Document #99 Comment #4 Commentor: Angel, Bradley

I am glad Green River was excluded, it was totally an inappropriate site. It is outrageous that White Mesa is still under consideration. It is actually closer than those other communities, and it has other very profound cultural, religious, traditional and sacred site issues.

Response:

DOE recognizes and respects the fact that the commentor, along with other commentors, feels that the White Mesa Mill site should not have been analyzed as an alternative in the EIS. However, DOE's interpretation of the requirements of NEPA to evaluate "all reasonable alternatives" required that the White Mesa Mill site be included in the EIS.
==

Document #99 Comment #5 Commentor: Angel, Bradley

And then on November 30, 2004, the draft EIS was released and again the Department of Energy claims that they have to look at all reasonable alternatives. And I am here to ask what is reasonable about a proposal from International Uranium Corporation to take the radioactive and toxic waste from Moab, use incredible amounts of water in a slurry line, an 85-mile line, and dump the waste on top of the sacred sites and burials of the ancestors of the Ute people.

Response:

See response to comment #4.
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Document #99 Comment #6 Commentor: Angel, Bradley

Tomorrow the DOE will be formally presented by White Mesa Ute community members with a formal complaint documenting how you are violating the Executive Order on Environmental Justice, the Federal Sacred Site Protection requirements, Tribal consultation requirements, and federal statutes on the protection and preservation of traditional religions in Native Americans. Don't wait for the EIS to drop White Mesa, start doing the right thing so we can all work together on the true solutions that will protect everybody.

Response:

In accordance with the executive order on environmental justice, DOE analyzed impacts to minority populations in the EIS. In Section 4.4.18, Environmental Justice, the EIS clearly states that "Disproportionate adverse impacts to minority and low-income populations would occur under this [the White Mesa Mill] alternative as a result of unavoidable adverse impacts on potential traditional cultural properties located on and near the White Mesa Mill site, the proposed White Mesa Mill pipeline route, White Mesa Mill borrow area, and Blanding borrow area (see Sections 4.4.9 and 4.5)." Also, see response to comment #3.
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Document #100 Comment #1 Commentor: Hedden, Bill—Grand Canyon Trust

I hope the DOE appreciates -- we are very glad that you are here, by the way, and I hope you appreciate what an exercise in democracy this is for us, because we were doing this now for 12 years, and we still got the pile sitting there, and we just saw comments go from the governors of Utah and New Mexico and Arizona, and Nevada and California all telling DOE that any solution that leaves the tailings by the river is completely unacceptable. So for us to be here and feel that our voices make a difference is truly an expression of hope and faith in America, so I hope you take it very seriously, and I know that you do.

Response:

DOE appreciates the perseverance demonstrated by many in the area in continuing their participation in this difficult process. DOE assures the commentor that the comments received will be taken seriously in DOE's final decision-making.
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Document #100 Comment #2 Commentor: Hedden, Bill

I think when everyone is in agreement, like we have been so far tonight, it is very easy to forget that there is actually a document that is sitting there that is what we are talking about, and it is a document that is going to Washington, and it is only what is in there that is going to matter, and there are two really big fundamental problems with that document as far as I am concerned.

One is the failure to really understand what the time, what 1,000 years is, and what kind of changes are likely to happen in this society, and in the Southwest over 1,000 years.

And the other which is kind of interrelated with that is a real misjudgment of the Colorado River, both how important it is to society, how important it is going to become during the next 1,000 years, and how violent and unpredictable it is. And these things kind of all connect with one another.

If you imagine the ancestral native American people who lived here 1,000 years ago, and try to see how they would picture the Southwest, whether the people who did the Moab panel out there would envision Moab and the way we use the land around here today, with the Hohokam people in Phoenix, if they might have understood what the Central Arizona project was and what Phoenix has become, or Southern California, you can get the beginnings of an idea what a 1,000 years means.

100 years ago the Colorado flowed free into the Gulf of California, and today we have spent more money per gallon diverting and using that for human use than any other big river in the world, and not a drop of it gets to the ocean anymore. Every bit of it is used by human beings for our drinking water or for our agriculture for some of the most highly valued food crops in this county.

1,000 years from now people may reverently be taking water out of that river with a thimble, and yet in the EIS we read that it is okay that the contaminants are in the groundwater because it is salty and so it is a limited use aquifer, and really there is no need to clean it up, but DOE will agree to do some active cleanup because it is going into the Colorado, we need to make sure that some local fish right next to the pile don’t get poisoned.

Response:

DOE acknowledges the commentor’s concern regarding the long-term implications of this decision and the current and future importance of Colorado River water. DOE will continue to consider this comment as it moves forward in its decsion-making process.
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Document #100 Comment #3 Commentor: Hedden, Bill

Well, we are talking about 1,000 years. What is the community of Moab going to look like 1,000 years from now, how much of our drinking water will be withdrawn from the Colorado right here? Because we are already seeing the limits of the groundwater that is available to this community. What will be the uses downstream? If you haven't been reading the newspaper they are starting to fight over the Colorado big time as Lake Powell disappears, and we need to look at a term that is not in any way addressed in the EIS, and this is a dramatic failure of this document.

Response:

DOE acknowledges the commentor's concern for future water use and impacts and discusses these impacts in Section 4.1.4 for the on-site disposal alternative and Section 4.4.3 for the White Mesa Mill alternative.
==

Document #100 Comment #4 Commentor: Hedden, Bill

The other place where the failure really becomes apparent is the failure to consider what big floods in the Colorado look like.

If you look at the site from the air, you will see that no matter what happens with subsidence in the Moab Valley, the pile will always be directly in the path of the river coming out of the canyon, and if you have seen photographs of the floods in 1917, see what that looked like, and then realize that in 1884 the flood was 60 percent higher than that, you will know the reason, that the tailings pile is sitting in the middle of an alluvial fan. The Colorado blows through that place, it scours the ground down, and results in a very, very real prospect that the Colorado River will destroy the tailings pile during the course of the regulatory time frame.

Response:

The Department agrees that at some point in the future, especially considering geologic time, the river will cross the Moab site. The Department's analyses conclude that engineering controls can be used to resolve this issue for the regulatory time of 200 to 1,000 years. If on-site disposal were selected, the disposal cell at the Moab site would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell. Further discussion of the differing opinions over river migration is included in Section 2.6.4.
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Document #100 Comment #5 Commentor: Hedden, Bill

And here is where we reach one of the most surrealistic parts of the EIS where the DOE describes a scenario which the pile is going down the river, and it is spread for 100 miles throughout the riparian zone up in the bushes and in the river channels and all through Lake Powell, and concludes there is no risk to human beings. This is the kind of thing that is all over the EIS, and it needs to be corrected in the EIS so you will be adequately finding the preferred alternative, which is to move it to Klondike.

Response:

DOE believes the screening assessment of impacts from catastrophic disposal cell failure in Section 4.1.17 reasonably represents the effects of the assumed, though highly unlikely, failure scenario. The commentor's preference for relocating the tailings pile to the Klondike Flats site is noted.

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Document #101 Comment #1 Commentor: Oblak, Denise

I am here speaking as an individual citizen, a business owner here in Moab, and also as president of the Utah Guides and Outfitters Association to support the moving of the tailings pile, preferably to the Klondike Bluffs area. I agree it is the closest, the least risk I think is involved in transporting it there.

Response:

The commentor's preference for relocating the tailings pile to the Klondike Flats site is noted. The transportation risks are identified for each alternative in the human health sections of Chapter 4 (4.1.15, 4.2.15, 4.3.14, 4.4.15, and 4.6.15).
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Document #101 Comment #2 Commentor: Oblak, Denise

I think one thing that hasn't been mentioned tonight, I won't go over all the other very good comments, is the possibility of the earthquake fault becoming active, and if that pile were capped in place, I realize that it is a remote possibility, but then, you know, big flows happen on the Colorado, what if you had an earthquake event, which actually did happen here in the late '80s, that could be felt in houses here in Moab. So if you have got a cap on that pile, that cap is compromised, what if you had a flood at the same time, all that money that is spent capping it in place, is for naught.

Response:

A systematic evaluation of geologic processes that could affect the site is detailed in Chapter 4.0 (Environmental Consequences) in the EIS. Uncertainties related to disposal cell or tailings pile failure are addressed in Table S−1.
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Document #101 Comment #3 Commentor: Oblak, Denise

And I know there have been other situations down in Monticello where you have moved a pile once, and then had to move a pile again, and just spend the money, do it right, move it now.

Response:

DOE acknowledges the commentor's concerns.
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Document #102 Comment #1 Commentor: Wait, Jeannine

I know that I am preaching to the choir here, but one of the first things millions of annual visitors to Moab see is the towering tonnage of toxic tailings. A roadside legacy of our uranium mining past, and a clear sign that our present government is not concerned with the health and safety of our community, our many international visitors, or the millions of downstream citizens who depend on the water in the Colorado River.

I am in favor as everyone else has been of moving the Atlas tailings pile to the Klondike area, which would cost less than a couple of days expense of continuing the unpopular war on Iraq.

Response:

DOE assumed responsibility for the Moab site in 2000 and has been diligently working to control the site radiological hazards and identify the appropriate reclamation alternative to ensure interim and long-term protection of public health and the environment. The application of the NEPA process, of which this EIS is a part, is one aspect of DOE's attempts in this area. The commentor's preference for relocating the tailings pile to the Klondike Flats site is noted.
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Document #103 Comment #1 Commentor: Fields, Sarah

One thing I want to point out is that we are operating under Uranium Mill Tailings Radiation Control Act of 1978, and when Congress passed that Act, they did a couple of house reports, and those house reports indicated what their intent was when they passed this Act.

One of the things they indicated was that they expect that the public is to have a strong role in the selection of any remedies through procedures provided by the National Environmental Policy Act, and is expected that the Secretary will give full consideration to the wishes of the public as is expressed through those processes.

So congress intended that our comments today count, and they count big time. We are not talking about money, we are not talking about the various technical aspects of the situation, we are talking about the considered wishes of the public.

Response:

DOE has considered public input throughout the preparation of the EIS. This input has been instrumental in the identification of off-site disposal at Crescent Junction using rail and active ground water remediation as the preferred alternatives in this EIS and will continue to be considered as DOE finalizes its decision.
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Document #103 Comment #2 Commentor: Fields, Sarah

Congress also said that in some cases the department will remedy inactive tailings hazards, and the tailings will be removed from the original processing sites and disposed of at more suitable locations.

Doesn’t that make sense. So I think everybody said that the original processing site is not a suitable location. And many people have said Klondike Flats, some people have said Klondike Flats or Crescent Junction. We have felt that Crescent Junction is the better site, and the tailings, if moved there, would be the safest, and away from human intrusion, and would be the least likely spot for the contamination of the environment.

And a couple of reasons for that is the shale in the Crescent Junction area is much deeper, there is not the kind of impact from tourists, from people running around on ATVs and bicycles, the way there is in Klondike Flats.

Response:

The commentor’s characterization of the intent of UMTRCA to remedy inactive tailings hazards, and in some cases relocate the tailings from the original processing sites to more suitable locations, is essentially correct. The comment characterizes features of the sites that are included in Sections 3.2 and 3.3, which describe the affected environments of the Klondike Flats and Crescent Junction sites, including the hydrologic, geologic, and land use conditions. Sections 4.2 and 4.3 identify the impacts and consequences of the alternatives for each site, including land use.
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Document #103 Comment #3 Commentor: Fields, Sarah

And also Klondike Flats is right next to or close to the airport. It is also close to the refuse disposal site.

So particularly during the remediation period, if it were to be moved there, there would be a tremendous amount of impact in that area. And we are looking for the most isolated site, and that is the Klondike Flats site -- I mean the Crescent Junction site, right, and by rail. Obviously transportation by truck would have enormous negative impacts on the traffic on Highway 191, and would probably severely impact that roadway and it would, in the end, it would just have to be replaced, and I don't think the DOE has considered that into their financial calculations.

Response:

The land use and transportation impacts of relocating the tailings to the Klondike Flats site are identified in Section 4.2.8. The commentor's preference for relocating the tailings pile to the Crescent Junction site by rail is noted. Replacement cost of the entire road for the truck haul alternative is not considered, as there is no basis for assuming that the level of traffic for this transportation alternative would result in sufficient impact to the road to require replacement.
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Document #103 Comment #4 Commentor: Fields, Sarah

Another concern that I have is that if the DOE decides to leave the pile in place here in Moab, that that might not happen for years and years and years. There is going to be still the question of a settlement of the tailings pile. The DOE does not really know how long that is going to take. So you are talking about maybe eight years, 10 years, 12 years, 15 years, maybe never.

Response:

The time for the tailings to consolidate (settle) sufficiently to allow construction of the final reclamation cover is uncertain. The estimated time period to complete the on-site disposal alternative, including this uncertainty, is reflected in the schedule for on-site disposal in Figure 2−1.
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Document #104 Comment #1 Commentor: Lowe, Janet

In the 14 years I have lived in Moab, I don't believe I have ever seen this county unify on any issue, and it speaks volumes to how important this issue is that we are unified as much as we are.

There were 22 waste piles located along waterways. Twenty-one of them were moved because they were considered too dangerous to remain in place. Yet it seems there are people or agencies who want us to believe that this last one is safe enough to be capped in place, when actually this pile, one of the largest and potentially most toxic, is near -- is probably one of the least stable of all of the 22 water piles. It is situated on one of the most powerful rivers in the west, and the river has apparently during the last 40 years migrated 300 feet toward the pile, not away from it. I simply don't buy that this pile is safe enough to cap in place.

Response:

The Department disagrees that the river has migrated 300 feet toward the pile during the last 40 years. Historical information from aerial photographs and historical topographic-cadastral maps indicate the river channel has remained relatively stable for the last 120 years (DOE 2003b). If on-site disposal were selected as DOE's final decision, the cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell. Further discussion of the differing opinions over river migration is included in Section 2.6.4.

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Document #104 Comment #2 Commentor: Lowe, Janet

And I think the only reason that it would remain on the banks of the Colorado River is money. But if the government thinks it would be costly to move it now, I have to ask how expensive it would be to clean up the length of the Colorado, from here to the coast. I have to ask how expensive it would be to reclaim millions and millions of acres of agricultural lands that use that water. And I have to ask at what cost in terms of the safety and health of the millions of people who live downstream in Arizona, Nevada, California, and Utah.

I don't believe that the government has a right to gamble with so many lives and so many economies, in the event of a catastrophe, and today perhaps more than any other time in our history we know that catastrophes do happen.

Response:

DOE acknowledges that cost is one of the factors that will be considered in making its final decision, and DOE values all public comment on this decision-making process. In Section 4.1.17 of the EIS, DOE evaluated the environmental impacts associated with the highly unlikely event of a catastrophic failure of an on-site disposal cell. However, given the engineering controls for the on-site disposal alternative and the velocities of the worst-case floodwaters, the likelihood of catastrophic failure and the need for remediation are so remote that detailed quantification of these impacts is not included in the scope of the EIS.

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Document #104 Comment #3 Commentor: Lowe, Janet

You have spoken of uncertainty and many issues related to this pile and to the river. And because of these uncertainties there is only one option. Move it, move it the shortest distance. Move it in the safest way possible, to the most secure place possible. And do it as soon as humanly possible.

Response:

The EIS characterizes the consequences of uncertainty in Section 2.6.3.

DOE acknowledges the commentor's views. In the final EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as it preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Although Crescent Junction is not the closest off-site location considered in the EIS, DOE believes it is the best off-site alternative location. Section 1.4.5 discusses the basis for DOE's position.
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Document #105 Comment #1 Commentor: McCleary, Jeff

I would like to make a couple of comments on the draft EIS as well. It does note in several places that Utah wants the pile moved due to river migration issues, but doesn't note that Grand County has previously expressed river migration issues in a series of correspondence between Grand County and the Nuclear Regulatory Commission in the 1996, '97 time frame. And there was some data that was submitted by Grand County in conjunction with that series of letters. One was an air photo study that we did comparing photos taken on June 30th of '75, and August 17th of '95, so a 20-year time frame. Those photos were digitized and rectified in our info, and indicated the river moving toward the pile.

Response:

DOE has examined historical information from aerial photographs and historical topographic-cadastral maps and concluded that the river channel has remained relatively stable for the last 120 years (DOE 2003b).
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Document #105 Comment #2 Commentor: McCleary, Jeff

We also did a little sediment-logical study looking at heavy minerals in the Colorado River. The idea being that Atlas at the time was claiming that Courthouse Wash and Moab Wash had sufficient strength to essentially overpower the river and force the Colorado to the south away from the pile.

Well, if you look at the sediment type in the Colorado River, and the sediment types coming out of Courthouse Wash and Moab Wash, and then you could sample sediments on the north side of the river, on the pile side of the river, you should see if indeed Moab Wash and Courthouse Wash were overpowering, you should see a heavy minerals sweep that was characteristic of two streams, rather than a heavy mineral sweep that was characteristic of the Colorado River.

So it was a very simplistic little thing. We just took some small samples, magnetite was the easiest thing to look at because literally you can pick it up with a little kitchen magnet. And as you would expect, the Colorado has a high magnetite content that is eroding through Precambrian igneous metamorphic rock at the headwaters, and carries that material along downstream. Courthouse Wash is almost clean of magnetite. You are draining a pretty good-sized area of mesozoic sandstones that have a lot of those heavy metals oxidized and leached out of them so you don't see much.

Moab Wash a little bit in between, because you are draining an area that has Cutler sediments, and they do contain some magnetite, but far less than what we see in the Colorado River.

And Peter Haney and I put down a little -- who was a county councilman back in that time frame, and I kind of volunteered some of my time to work with Peter, and we went out and checked McClasky's property on the north side of the river, and put down a little hand auger boring, a glorified posthole digger that Peter and I welded up in his back yard, and the sediments there have a magnetite content that is much more similar to the Colorado River, than either Moab Wash or Courthouse Wash. So you would expect some input of sediment, you would not necessarily expect to see a total match with the Colorado River, magnetite sweep, but what we

Document #105 Comment #2 - continued

are seeing is a strong indication that the river has migrated back and forth across the valley through geologic time.

So that bit of data of course was available since ‘96, and I guess I am a little bit upset that that information, you know, conflicting opinions, whatever, did not necessarily make it into the EIS. It does acknowledge uncertainties, but it kind of looks like maybe some selective data has been utilized.

Response:

The commentor states that sediments on the McClasky property on the north side of the river contain a magnetite content that is much more similar to the content in the sediments of the Colorado River than to the content in the sediments of either Moab Wash or Courthouse Wash. The commentor suggests that this is a strong indication that the river has migrated back and forth across the valley through geologic time.

DOE agrees with the commentor that the river has migrated back and forth across the valley through geologic time. Several calculation sets prepared by DOE indicate that sediments deposited on the north side of the river were deposited by the Colorado River. Most of the borings DOE drilled within the site boundary encountered sand and gravels deposited by the ancestral Colorado River (DOE 2003a). The gravel clasts typically consist of rounded pebbles and cobbles of resistant crystalline rock types that have been eroded and transported from metamorphic and igneous rocks present in the upper Colorado River basin.
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Document #105 Comment #3 Commentor: McCleary, Jeff

Another comment on the geologic hazard evaluation section of the draft EIS does not discuss the formation of breccia pipes due to salt dissolution. It is a more localized feature than the general ongoing salt dissolution that is occurring. You usually see blocks of overlying stratigraphic units that are dropped down in a coarse breccia, angular material in a fairly circular pipe like structure. These are very common all through the Paradox Basin, you see them down in Lochart Basin, you see them along the southeast margin of Moab Spanish Valley, and the closest one to the Atlas site is right across the street at the entrance to Arches Park. And it is a probability argument, would one of these things form at or under the pile, it is hard to say, but it is something that has been studied, it has been known to the NRC, they are supposed to be a cooperating federal agency, and it doesn’t show up in the draft EIS.

Response:

A systematic evaluation of geologic processes that could affect the site, including salt dissolution, is detailed in Section 4.1.1.
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Document #105 Comment #4 Commentor: McCleary, Jeff

And I think one of the problems might be that there is kind of a lack of a systematic discussion in the EIS features, events and processes that could impact the ability of the Moab site to adequately contain the waste.

30 seconds, I will have to go fast.

I think that a disciplined, systematic look at features such as the breccia pipe and the faults, processes such as river migration and salt dissolution and events such as even climate change, the best models now are that in 600 to 1,000 years we might be moving into a glacial, which would mean more larger floods and more frequent floods on the Colorado, and a systematic look at all of the things that could affect that site I think would benefit the document.

Response:

See response to comment #3.
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Document #106 Comment #1 Commentor: Thuesen, Jim

I had a couple ideas when I came tonight, but I have been taking some little notes and this meeting is inviting informed citizens to come and speak. Well, I don't know what your count is, but I found 25 people say move the pile. I haven't found anybody say leave it where it is. Now there are differing opinions. I talked to one of the old-timers one time who said, all this mining we did, he said there wasn't any problem, and after about two minutes of coughing, he said when it was handled right. Well, let's handle it right. That is the problem, some of the miners, a lot of miners, have big problems, because they were in unventilated mines. That was the biggest thing. The guys who came out all right, they said, the mines they worked in had free-flowing air all the time. So that is something that we didn't realize at the time. The government wanted uranium, we gave them uranium, and it caused a lot of problems. Now we are asking the government to do the opposite. We are asking them to move this uranium, and it is not the uranium so much, it is all the rest of the stuff that goes in there. We want them to move it, and we want them to move it someplace safe for everybody, not just for us. We don't use that water. The closest I get to that water is upstream or way downstream, because I don't want to swim outside that tailings pile.

Response:

DOE appreciates the sacrifices that current and former uranium workers have made over the years in supporting our nation's energy and defense needs and will consider these comments in its decision-making process.

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Document #106 Comment #2 Commentor: Thuesen, Jim

There is a lot of things we have talked about, the water issue, the river issue. I can't believe that we can say that pile will not some day be washed away, or part of it washed away, and it won't take much. And what happens if it is washed away? So we are talking about 26 million people in the U.S. The first thing that is going to happen is if the integrity of that pile is broken by the river, it is going downstream, and then I see these pumps just going off, bang, bang, bang, all the way down through every lake, every dam, the pumps are going to be shut off. And where is it going to go? It winds up going down to the Sea of Cortez, which is where by treaty with Mexico, some of it is supposed to go, and I don't know if they have gotten any in the last number of years, but when they get it, it is going to be all bad. The Sea of Cortez, I don't know how many of you go there, I love Baja, I am going down there in May, the Sea of Cortez is one of the world's greatest fisheries. It is where many, many species breed only, it is the only place where certain species of fish breed. And if we set this stuff to go down there, what is going to happen to them. It is not just national politics, it is international politics, Mexico, South America, everywhere below here is going to be affected if there is a problem with this tailings pile. And there is nothing we can do about it, except move it.

Response:

The Department agrees that at some point in the future, especially considering geologic time, the river will cross the Moab site. The Department's analyses conclude that engineering controls can be used to resolve this issue for the near term (200 to 1,000 years). However, in Section 4.1.17 of the EIS, catastrophic failure of an on-site disposal cell is assumed and the impacts are quantified. If on-site disposal were selected, the cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell. Further discussion of the differing opinions over river migration is included in Section 2.6.4.

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Document #106 Comment #3 Commentor: Thuesen, Jim

I am sorry, I just can't believe that we have ever gotten smart enough or strong enough to beat Mother Nature. Look at Florida, look at St. George, look at Florida, every year they get the hurricanes, and I want to tell you 120 or 130,000 c.f.s. in the Colorado River is going to put that all to shame, because it is going to take this out, it is going to change the look of the Grand Canyon, because that is how it was made.

Response:

DOE acknowledges the commentor's concern regarding the uncertainties related to the unpredictable forces of Mother Nature and has addressed these concerns in the EIS. For example, flooding impacts are assessed in Section 4.1.3.1, and subsidence impacts are characterized in Section 4.1.1.1. Also, see response to comment #2.

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Document #106 Comment #4   Commentor: Thuesen, Jim

I kind of think the real easy way to change this is if there is somehow we could divert the flow of the Colorado River, change it to go up through Salt Lake City and out to Washington, D.C. and be done, no problems, everybody would have a good time.

Response:

Diversion of the Colorado River through Salt Lake City and Washington, D.C., is not considered a reasonable alternative.
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Document #106 Comment #5   Commentor: Thuesen, Jim

Otherwise, you know, we have this -- you cap it in place, what do we have, we have another tourism thing, the Moab pyramid, the glowing pyramid of Moab. If you get rid of it, we might actually be able to use that land for some good reason. I know the golfers all say a golf course. I am thinking about a river park or just so many things we could do with all those acres.
And I am being told I am done, and I can’t think of anything else I want to say, except for all of our sakes, please move it.

Response:

While DOE did not consider specific future beneficial uses of the Moab site in the EIS, relocating the tailings pile to an off-site location could provide the opportunity for future use of the site. DOE will consider this fact in its final decision-making.
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Document #107 Comment #1 Commentor: Regehr, Ron

I want to thank everybody for coming here tonight. But I notice there are some people missing. John Mathis, our local representative is not here. Bob Bennett, our senator is not here. Warren Hatch, our other senator isn't here. They are the guys that are going to make this thing happen if we prod them enough. So our job as well as attending these presentations and impact statement reports, talking to each other, writing letters to the editor is to write letters to the people who are going to vote on this. Let them know where we stand, let them know how we think. Ask these people to give us a copy of our comments so we can send them to our elected representatives, because they are the ones that will ultimately make the decisions that will affect our lives. Rest assured, if this tailings pile was on the side of the Potomac it would have been moved 10 years ago. If it was in Crawford, Texas it would be moved next week. But it happens to be in Moab and nobody cares but us.

Response:

Probably as a result of individuals such as the commentor, DOE has received many comments from elected officials from several states who have expressed their opinions on DOE's decision-making. Additionally, the Secretary of Energy has testified before several congressional hearings on the subject of the Moab mill tailings. Transcripts of the hearing were placed in the reading rooms shortly after the public meetings and are available on the project web page for all interested commentors.
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Document #107 Comment #2 Commentor: Regehr, Ron

So our responsibility is to take charge of our lives, to do what we have to do, to get this tailings pile moved. Showing up here is a good sign, but we have to go farther than that, we have to do more. We can't stop and think, gee, I missed out on dinner, I am going to have a late dinner but I said something. We have to continue, we have to continue putting pressure on the people that make the decisions.

Response:

Probably as a result of individuals such as the commentor, DOE has received many comments from elected officials from several states who have expressed their opinions on DOE's decision-making.
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Document #108 Comment #1 Commentor: Graham, Audrey

I just want to thank the DOE for bringing us together like this, like I have never seen before, bringing our community together, and I would love to see us continue working like this, but I hope it is not over something this serious.

We the public in this community are really stuck with no ability, practical, financial or otherwise, to deal with this pile that is right next door. We also are really -- we have no financial, practical, or actually responsibility, to take care of the health and safety of the 25 million people or whatever, downstream. So as the scientists and politicians fight this all out, what we need is action, and to me, we have come up and done our part, we have stepped up to the plate and done our part. And we are not asking to move this pile to Connecticut or to New Jersey. We are willing to pick up this pile and keep it in our community, and I am happy that geology has given us what the scientists are telling us is a safe place to put the pile. We didn't do that, but I am just happy that we have that, and just think that we need to be given some credit for doing our part as much as we can and finding places to put it. And I definitely think that the only ethical, sane thing to do is to move this pile.

Response:

DOE appreciates the participation of the public in this process. Public and agency comments have contributed to DOE's identification of the Crescent Junction site as the preferred disposal location, and these comments will continue to play a part in DOE's final decision-making.
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Document #108 Comment #2 Commentor: Graham, Audrey

With this EIS not having a preferred action, it does appear or sort of appear to me that it leans heavily on capping in place, and that really worries me that this is the report that will go to the decision makers.

Response:

The EIS provides an objective and comparable evaluation of all alternatives. As stated throughout this process, DOE was committed to reviewing the analyses provided by the EIS and public and agency comments on those analyses before identifying its preferred alternative. Based on the analyses provided in the EIS, and after considering the consequences of the uncertainties characterized in the EIS and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment.
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Document #108 Comment #3 Commentor: Graham, Audrey

My understanding, it has been brought up before, that there are something like 22 similar sites, 21 of which have been moved. Why is this site less important? Why are we less important?

Response:

The NAS recommended that DOE use the same protocols at the Moab site that have been used at other UMTRCA sites, and DOE did so. DOE considered numerous factors in past decisions to move tailings piles out of floodplains at other UMTRCA sites, among them the potential effects (positive and negative) to floodplains and wetlands. DOE will consider the same factors in its final decision regarding the Moab site. The Moab site is no less important than other sites, nor are affected individuals any less important there than elsewhere.

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Document #109 Comment #1 Commentor: Stolfa, Dave

And I guess how many here, raise your hand if you are in favor of moving the tailings. How many want it capped in place?

Let the record show that I think it is unanimous, or was there one vote. It wasn't unanimous, but it was very highly weighted towards moving it.

Response:

DOE recognizes the sentiments of the Moab public, whose opinions, along with the analyses and uncertainties characterized in the EIS and other comments received, contributed to DOE's identification of the Crescent Junction site as the preferred disposal location. DOE will continue to consider all of these opinions in its decision-making.
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Document #109 Comment #2 Commentor: Stolfa, Dave

I want to talk about the risks and uncertainty of leaving it in place. These deal with questions of geology and hydrology, and I know some people in the community of both those fields, and they are not exact sciences, they have only got histories of 120 years of direct evidence, of how the river flows. They only have sunk drill holes in a certain number of sites, or bounced sound waves off the subsurface. That is going to change over time.

If you look at what has happened to citizens in Utah in the last two generations, 1950s on, nuclear testing has affected us, and now we say, gee, we shouldn't have done that. Radon and mining has affected citizens. And now we say, oh, the standard practice is we shouldn't have done that.

My question is, what are we going to say in 20 years, oh, gee, we shouldn't have capped that pile. It was common sense we should have moved it. We think we have all the answers today. I think it is still very uncertain. If there is uncertainty we ought to take the safer route and move the pile. I don't really have an issue, I would say probably Klondike Flats, by train, would be my solution. I just am against capping it in place.

Response:

The EIS acknowledges the uncertainties regarding disposal alternatives (Section 2.6.3 of the EIS) and recognizes that commentors have responsible opposing views on several technical issues (Section 2.6.4). The commentor's preference for relocating the tailings pile, probably to the Klondike Flats site by rail, is noted.
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Document #110 Comment #1 Commentor: Darke, John

I appreciate that this is an on-the-record proceeding. And in an earlier portion of the NEPA process, I made the comment that, let's see, that I felt it was fair and it would be informative for the DOE staff if they could hear, you know, the suggestions.

One other person has responded, I believe a DOE contractor, and said we don't want to intimidate with the report. I think we have learned tonight, that it wouldn't have hurt.

Response:

The commentor is referring to DOE's decision not to transcribe scoping comments. DOE's experience over more than 30 years of NEPA compliance and hundreds, if not thousands, of public meetings was drawn upon in its decision not to use a court reporter during scoping. However, scoping comments were summarized during the meetings with commentors using poster boards. The results of the scoping process are summarized in Section 1.5.1 of the EIS. DOE has received no comments on the process expressing that the Department in any way failed to accurately reflect the sentiments of the participants in the scoping meetings.
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Document #110 Comment #2 Commentor: Darke, John

I would like, if it is acceptable to direct my comments on the record, in the context of this NEPA proceeding directly to this Secretary of Energy, and the appropriate Assistant Secretary, who will be delegated the responsibility with respect to overseeing the immediate decision-making process, which supposedly the Draft Environmental Impact Statement will impact. It is a decision-makers' document. I have reviewed thoroughly the DEIS, and I notice that it refers in many places elsewhere, if you want more information about this, go over, for example, to the site observation work plan. That is a three-volume set. I brought one volume, I didn't want to bring it up here, and cumulatively, it is about like that (indicating), with a whole bunch of plates that are about like this (indicating), and that document in turn refers to many other substantiations of the work product. Mr. Secretary, never since approximately 1970, where I appeared pro se, as I am here, have I ever seen such a disconnect between the Draft Environmental Impact Statement, and the technical material compiled by the DOE contractors, the DOE staff, that shows up in some, for example, Stoller's site observation of the plan, that three-volume set. It shows up -- I have never seen a more unsupported document. When you want to see whether a statement which is made is true or not, or there is a material misstatement of fact by omission or commission, normally you will be pointed by a footnote.

Response:

The commentor's statement is part of the record available to the Secretary of Energy used in his decision-making. All references cited in the EIS have been provided in the reading rooms located near all of the alternatives assessed in the EIS, with a few exceptions. For example, DOE did not provide materials that disclosed sensitive information (such as the locations of traditional cultural properties) or expensive materials whose cost of acquisition of multiple copies was deemed unwarranted. DOE is confident that the data used from cited references are consistent and utilizes comprehensive quality assurance and control procedures to maintain this assurance. As the commentor identified no specific examples of a "disconnect," a more specific response is not possible.

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Document #110 Comment #3 Commentor: Darke, John

And, Mr. Secretary, another thing that you need to take into consideration, is that never once from 1959, when this site was first licensed, through 1975, when the AEC relinquished responsibility for the regulation of this site to the NRC on January 18th of that year, up through the regulation by the NRC, of the licensee Atlas, through Price Waterhouse Cooper, who took over the site at the behest of the NRC, supposedly as a licensee, but probably as nothing more than a contractor, and through the arrival in town due to an amendment of the Atomic Energy Act, the Uranium Mill Tailings Radiation Control Act of 1978, by a private bill, the arrival in town of the DOE. I have since the '70s paid attention to some of the details, but most particularly, to the process, and the processes revealed, it is revealing tonight, that this is a NEPA process, that never once was the licensee representative a member of the public pro se like myself, a regulator, or as far as I know, no one outside of perhaps some civil proceedings somewhere, has been required to raise their right hand and swear to tell the truth and nothing but the truth, so help me, under the threat of perjury. This has never happened.

When I first became curious about this site back in 1987, I applied for a hearing, and it would have been a formal hearing, but back in Washington, and I have seen the paperwork, the decision was made that there is a proposed rule, so we don't have to have anybody get up and raise their right hand, and the licensee agreed, the licensee in the first place had asked for the hearing, is when they shut down the site. And from that day on, no one, DOE personnel, DOE contractors, all the way back, nobody has been required to go before a quasi-judicial body, or a judicial body outside of a civil proceeding, and raise their hand and say I am going to tell the truth.

Back to this. I have now so many unsubstantiated claims. I feel that regardless of the decision whether to move it, or to cap it in place, that this community, and I don't speak for this community, I am asking you, Mr. Secretary, there must be an opportunity for accountability, for transparency, there must be a forum in which your persons must get up in public and swear to tell the whole truth and nothing but the truth.

Response:

Although the NEPA process is not a judicial proceeding requiring that participants be sworn in, the integrity of DOE and its contractors has been demonstrated by decades of NEPA document preparation. Further, as included in Chapter 8.0, all contractors participating in the preparation of this EIS have signed sworn statements that they have no vested interest in the outcome of this EIS process.
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Document #110 Comment #4 Commentor: Darke, John

One more point, and I am through. There is an oversight process, once the DOE makes the decision as to whether to move it or cap it in place, the NRC will once again be in a position to concur with the Secretary of Energy's decision-makers. They in a way will have oversight over the DOE. The NRC for years, since 1975, and the AEC before that, has avoided having to get up and raise their right hand. And frankly, Mr. Secretary, I would respectfully request, as I understand it now, that the same NRC personnel that allowed in their -- through their regulatory responsibility to get to this past, will have oversight responsibilities over the DOE. I don't think that is appropriate, and I would respectfully request an alternative to that situation.
I have the utmost respect for the current project manager at the NRC, Dr. Myron Fleigel. He is a good person, he has a good technical team, but I feel that there is a conflict of interest, and it is an institutional conflict.

Response:

NRC is a cooperating agency in the preparation of this EIS along with 11 other federal, state, and local government agencies. While these organizations have had significant input into the EIS process and DOE's decision-making, the final decisions on remediation of the Moab mill tailings will be made by DOE alone. NRC's authority, as it has been for all previous UMTRCA Title I sites, will be the approval of DOE's remedial action plan prior to construction. In that role, NRC has no conflict of interest.

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Document #111 Comment #1 Commentor: Cozzens, Dave

I don’t have much to say, but I will say the same thing I have been saying for about the last 10 years since this fuss first exhibited itself. I want to see the tailings pile moved probably as much as anybody does, and that is as soon as it is proven that it is safe to do so. Anybody who has any doubts about the validity of my concerns should look up the article called Radon Daughter, and study what it will do to a biological body, and you might take note, and my facts could possibly be in error, but I am very certain that the first time that radon was ever detected in the monitoring system out there at the mill was when Price Waterhouse Cooper came here and began to dry out the pile. And I hope, I don’t know exactly, I am not up to date on what is happening out there right now, but I hope that they are not drying out the pile anymore.

And I certainly would like to see it moved, if it can be done safely. I am not sure that it can. I am a lot more concerned about the people in this valley, including my family and my friends, than I am about any number of the millions of people downstream or any fish.

Response:

DOE appreciates the perseverance demonstrated by many in the area in continuing their participation in this difficult process. As described in Section 2.2.1.2 of the EIS, preparation of the tailings for either rail or truck transportation would require additional drying. For purposes of the EIS, the required drying processes were assumed to bound impacts such as air emissions to workers and the public. Section 4.3.15 describes human health impacts that would occur as a result of exposure to radiation from activities at the Moab and Crescent Junction sites, at vicinity properties, or during transportation of materials.

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Document #112 Comment #1 Commentor: Webb, Chris—City of Blanding, City Manager

I am Chris Webb, C-h-r-i-s, W-e-b-b, I am City Manager for the City of Blanding and am speaking as a representative for the City of Blanding. We are a cooperating agency, and the first thing I would like to say is we appreciate the opportunity to be involved in the process, and it has been a very professional process.

Response:

DOE appreciates the compliment.

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Document #112 Comment #2 Commentor: Webb, Chris

One thing we have learned is that there are uncertainties with the whole process of determining what to do with this site, and that the decision-makers that are making decisions aren't all in Washington, that a lot of those decisions on what is included in the EIS and some of the comments that may have been determined to not be viable have not been included. So some decisions have been made already, with respect to what is in the EIS, and in general, and some of those comments and decisions that we don't totally agree with, but in general, we agree with the EIS.

Response:

The decision-makers in Washington have been actively involved in the preparation and approval of the content of this EIS. DOE has made every attempt to identify all areas of disagreement throughout the process and has included a Section 2.6.3 to specifically address areas of uncertainty and disagreement. DOE appreciates the City of Blanding's general agreement with the EIS.

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Document #112 Comment #3 Commentor: Webb, Chris

First, it appears as you look at the EIS that the first thing you want to try to start to do is to interpret it yourself and make decisions regarding, all right, this is the cheapest, that is the way we ought to go. Well, if that were the case then we would obviously do nothing and leave it in place and DOE would go away. And so we think that it is obvious that just because it is the cheapest, doesn't mean that is the way we ought to go. We are of the opinion that to leave the tailings capped in place does not eliminate the potential damage to the river and surrounding properties. In addition it does not stop the river's continuous move toward the contaminated pile. In our opinion, leaving it in place would only be a temporary solution with little to no investment return tradeoff.

Response:

Cost is only one of the considerations in selecting the preferred remedy for the Moab site. All the impacts identified in Chapter 4.0 are given significant consideration in weighing the impacts, costs, and benefits of all alternatives. Though DOE does not believe that on-site stabilization is an unreasonable alternative, Section 2.6.4 identifies the responsible opposing views on a variety of technical issues, such as river migration, as noted by the commentor.

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Document #112 Comment #4 Commentor: Webb, Chris

Further, as we look at the alternatives, we don't believe that there is any alternative that provides the same return on the investment that the slurry line option does in the White Mesa mill project, even if I use the alternative not the cheapest. Because aside from the economic impact to benefit the community and benefits of recycling and extracting the remaining minerals, what impact that would have is that the project would tie directly into our water shortage that has been plaguing San Juan County consistently in cycles, and those cycles every time they come around they cost the Federal Government millions of dollars in drought mitigation over the years. I know the City over the last five years have received three and a half million dollars in just one drought cycle, in the City of Blanding itself, and that does not include farmers and others in San Juan County that are affected by this drought that would benefit. One of the things we did, which was not taken into consideration in this EIS, is requested that the investment on that slurry line be considered, and we don't believe that it was given consideration in the least amount, and that it needs to have a return on investment that is not being considered with respect to that line.

Response:

DOE recognizes this concern; however, future use of infrastructure (for example, the pipeline) was considered to be outside the scope of the EIS for reasons discussed in Section 1.4.5. Such an action—withdrawal, transport, and use of Colorado River water—would require its own EIS, and the impacts of water withdrawal would require an additional Biological Assessment and Biological Opinion.
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Document #112 Comment #5 Commentor: Webb, Chris

The next point I want to make is why are we proposing to create a new site when we have a tailings site that exists? Why create a new tailings site? We don't need to do that. We pointed out in certain counties building a new tailings site, we don't think this makes any sense.

Response:

NEPA requires a federal agency to consider all reasonable alternatives. In DOE's judgment, off-site disposal at locations such as Klondike Flats and Crescent Junction, which do not currently have tailings, is a reasonable alternative.
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Document #112 Comment #6 Commentor: Webb, Chris

Again, the other thing we wanted to say is that we have been a little bit shocked and somewhat dismayed about the lack of understanding regarding the issues of public safety. We love our neighbors, we love our citizens, and we don't want anybody to get hurt. But emotions are high, there are misunderstandings that are too numerous to mention here tonight, but we have full confidence that the DOE has the ability to provide the necessary regulatory standards to ensure public safety and environmental compliance. Our education from the Utah Department of Environmental Quality, as well as our calls to the NRC, we have become educated and are somewhat comfortable as a city that the environmental -- that the processes can be handled both safely for the public, and the associated risks are minimal if nonexistent.

So along those lines, we encourage a full education program regarding the associated risks so that the public can come to the same conclusion that we have come, with the information that we have received.

Response:

DOE acknowledges the commentor's concerns. The EIS quantitatively and qualitatively characterizes the risks of the alternatives to human health and the environment to aid in the public's understanding of the potential impacts of the alternatives.
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Document #113 Comment #1 Commentor: Frazier, Anna Marie

I am from the Navajo Nation, southwest part of the Navajo Nation, and I am here on behalf of the White Mountain Ute, and the Navajos. And the Department of Energy-sponsored Draft Environmental Impact Statements to moving the uranium to the White Mesa mill from the Moab uranium mill, mill tailings will have a greater health adverse impact on the native people who live downwind, downriver and in and around Blanding. All of these people from White Mesa have been voicing their objection to the uranium waste facility at White Mesa for close to 30 years. To increase the volume of the uranium tailings at White Mesa, especially of the mill, will only increase the contamination of the groundwater, the air and create pollution. Then the air contaminants from any tailings facilities will be downwind and downstream.

Response:

DOE acknowledges the commentor's concerns. The environmental impacts associated with the White Mesa Mill alternative are identified in Section 4.4 of the EIS.

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Document #113 Comment #2 Commentor: Frazier, Anna Marie

People in the Four Corners area have a long history of exposure to uranium radiation causing cancer of all kinds from the uranium production since the 1930s.

Many of the uranium mines in the area are abandoned and were never reclaimed. It appears the Department of Energy and the Federal Government has not learned from the past and has no plans for the natives of the State of Utah to deal with more radiation exposure.

Response:

Past and current exposures from uranium mining are beyond the scope of this EIS. However, the federal government has programs to compensate retired uranium workers and existing regulations to protect the health of current and future workers and the public.

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Document #113 Comment #3 Commentor: Frazier, Anna Marie

The native people of the area have lived here way before the white man came to this country. There are many cultural sites such as burial places, old dwellings, Anasazi ruins of which we are descendants. There are places where our ancestors fought battles. There are herbs for healing, and downriver from the mill there are offering places throughout this area. The White Mesa mill was built over more than 200 Ute and Navajo and Anasazi ceremonial and burial sites. This is a clear violation of the Historic Sites Act, which was passed in 1935; National Historical Preservation Act in 1966; American Indians Freedom Act, 1978; and the Archaeological Preservation Act, 1979. The Ute Tribe and Navajo Tribal culture don't understand why the white folks will never understand why we preferred the mill site as sacred and want to protect the values that were passed on to us. Our ancestors learned to respect the burial places, the areas our ancestors lived and prayed. Our great-great-grandparents survived the cultures and treatment under the U.S. Cavalry, and by practicing their own little prayers and following the values that were carried on today. It is a way of life. And as long as you live here, as our neighbors, we will continue to voice our standing as to the desecration of the culture and burial sites, because that is who we are.

Response:

DOE has listened to the comments received from Native Americans and other members of the public concerning protection of archaeological and sacred sites at the White Mesa Mill site and surrounding area. DOE will continue to consider these comments in its final decision-making.
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Document #113 Comment #4 Commentor: Frazier, Anna Marie

The value of the future of our children is valuable, and we don’t want anything in any form that will harm our people and our living species in this area. We have learned that through our history. The White Mesa mill is almost 30 years old, the lining of those cesspools that are located behind the facility will eventually corrode. The man-made pipe will corrode and there will be spills somewhere, and something will eventually happen and everyone will suffer from the spill to the White Mesa Utes and Navajos and those living downriver.

We also have the White Mesa Utes and Navajos that use our environment. We are opposed to the Draft Environmental Impact Statement, and moving the uranium mill tailings to include White Mesa mill as one of their three on-site facilities.
And thank you.

Response:

DOE appreciates the commentor’s concern for the health and well-being of future generations and acknowledges the commentor’s preference not to have the Moab tailings moved to the White Mesa Mill site.
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Document #114 Comment #1 Commentor: Loux, Robert—Nevada Agency for Nuclear Projects

The following are the comments of the Nevada Agency for Nuclear Projects regarding the subject Draft EIS, submitted on behalf of the State of Nevada.

Nevada's immediate interest in remediation of the Moab uranium mill tailings, currently stored on the west bank of the Colorado River, near Moab, Utah, is the long-term protection of the quality of Colorado River water, upon which the existing and rapidly growing population of southern Nevada relies for a large portion of its drinking water.

We agree with the Department of Energy's assessment (page S−48) that, "Selection of the No Action alternative for either surface or ground water remediation would not fulfill DOE's obligations under federal law to protect human health and the environment." The current location of the uranium mill tailings leaves them vulnerable to erosion by the flow of the Colorado River during times of flood, and contributes to contaminants entering surface water and local groundwater.

Response:

DOE acknowledges the agency's concern regarding the No Action alternative. In the EIS (Section 2.4), DOE acknowledges that the No Action alternative would not comply with 40 CFR 192 standards.
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Document #114 Comment #2 Commentor: Loux, Robert

The On-Site Disposal Alternative, described as "stabilizing and capping the tailings pile in place" (page 1−7), while designed to meet applicable requirements of the Environmental Protection Agency and the Nuclear Regulatory Commission, does not permanently alleviate the risk of erosion of the tailings pile. And it does not afford the opportunity for permanent remediation of the currently contaminated groundwater. Relocation of the uranium tailings to a suitable alternative site, with appropriate design and subsequent monitoring, would eliminate the risk of future erosion of contaminants into the Colorado River from this source, and would provide for the long-term protection of surface water quality. Additionally, according to the Draft EIS, remediation of the currently contaminated groundwater could be accomplished to meet a standard acceptable to the affected parties.

Response:

DOE acknowledges the agency's support for the off-site disposal alternative and agrees that relocating the uranium tailings to an off-site location would eliminate the risk of erosion of contaminants into the Colorado River. DOE also acknowledges the agency's concern regarding the potential for the Colorado River to erode the tailings during a very forceful flood. As stated in Section 2.1.4 of the EIS, an on-site disposal cell would include side slopes armored with riprap of sufficient size (12 to 36 inches) to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would prevent any catastrophic failure of an on-site disposal cell. If the on-site disposal alternative were selected, recent USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall. The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials would be sized to withstand the maximum river forces identified by the USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment.

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.
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Document #119 Comment #1 Commentor: Congressional Delegation of Utah

We write to express the strong and united support of the Utah Congressional delegation for moving the Moab Uranium Mill Tailings Pile from the banks of the Colorado River, and to urge that an alternative accomplishing that objective be selected from the recently released Draft Environmental Impact Statement (DEIS).

Response:

The Utah Congressional Delegation's support for removing the tailings pile from the banks of the Colorado River is noted, and DOE will consider this and other opinions in its final decision-making.
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Document #119 Comment #2 Commentor: Congressional Delegation of Utah

The state of Utah, with the strong support of its Congressional delegation, has been working closely with the federal government for more than a decade to reach resolution regarding questions about the tailings pile and its remediation. As you may know, the delegation, with the support of DOE, successfully included language in the Floyd D. Spence National Defense Authorization Act for FY 2001 (P.L. 106-398) that amended the Uranium Mill Tailings Radiation Control Act (UMTRCA) to transfer ownership of the Moab pile to DOE and to direct its remediation.

Response:

DOE recognizes and appreciates the continuing contributions of the State of Utah in assisting the federal government with the cleanup of the tailings pile.
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Document #119 Comment #3 Commentor: Congressional Delegation of Utah

Contaminants, including ammonia, various metals, and radionuclides, are presently leaching into the Colorado River from the tailings pile, placing threatened and endangered species at risk. We are also concerned that as long as the tailings pile remains along the banks of the river, the migration of those contaminants will continue to threaten not only water quality in the Colorado River, but adjacent wetlands, and groundwater down gradient of the pile. Moreover, the review by the National Academy of Sciences panel, directed to take place as part of the legislation, highlighted the significance of considering the lack of stability, through time, of the existing riverbank site as DOE developed its remediation plan. Geologic data has proven instrumental in demonstrating the extent of the river's migration both under the tailings pile and the Matheson Marsh in the recent past. Consequently, we believe the only appropriate action is to move the pile from the banks of the river.

Response:

DOE's proposed active ground water remediation would alleviate the near-term threat to ecological resources from site discharges, and an on-site disposal cell would provide environmental protection for the regulatory compliance period and beyond. DOE acknowledges uncertainties in its analyses (Section 2.6.3) and opposing views (Section 2.6.4) and will consider these factors in its final decision-making.
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Document #119 Comment #4 Commentor: Congressional Delegation of Utah

We believe there is broad support among local, state, and federal stakeholders for moving the tailings pile and we urge you to select an alternative that would result in the moving of the pile from the banks of the river

Response:

See response to comment #1.
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Document #120 Comment #1 Commentor: Stafford, Michael J.—Nevada Department of Administration

The State Clearinghouse, as per Executive Order 12372, has processed the proposal and has no comment. Your proposal is not in conflict with state plans, goals or objectives.

Response:

Thank you.
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Document #127 Comment #1 Commentor: McCleary, Jeff and Wren

1) The draft EIS fails to include information from two studies conducted by Grand County and submitted to the NRC (a cooperating agency for the EIS) in 1996. These studies were a sediment study that indicated that the Colorado River has migrated across its floodplain in the geologically recent past, and an air photo study that indicated the river has migrated toward the pile between photo dates of 6/30/75 and 8/17/95. The draft EIS should be an objective document. Omitting available, previously submitted information that does not support DOE's contention that the current site is suitable for a disposal cell biases the document and undermines its credibility.

Response:

DOE considered all available information in assessing the impacts of the alternatives in the EIS. The cited studies are included in the project files but were not used as reference sources for the EIS. Further, DOE acknowledges that flooding would occur under the on-site disposal alternative and quantifies those impacts in Section 4.1.3.1 of the EIS. However, there are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these opposing views (Section 2.6.4). If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the already low probability of a catastrophic failure of a disposal cell should river migration toward the pile begin to occur unexpectedly.
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Document #127 Comment #2 Commentor: McCleary, Jeff and Wren

2) The geologic hazard evaluation fails to discuss the formation of breccia pipes due to salt dissolution. Breccia pipes of this type are common in the Paradox Basin, and the closest one to the tailings pile is right across the highway at the entrance to Arches National Park. Again, the breccia pipe issue was known to the NRC (a cooperating agency for the EIS) in 1996 but has been omitted from the draft EIS.

Response:

DOE disagrees that the EIS fails to discuss breccia pipes (pipes). Section 3.1.1.4 states: "Piping and rapid erosion may occur in fine-grained soils and unconsolidated fine-grained sediments at the site along the ephemeral stream channel of Moab Wash. The piping can occur when water from storms flows into permeable, noncohesive layers, removes fine sediments, and exits where the layer reaches the surface (Doelling et al. 2002). The void space created is a 'pipe' that promotes accelerated erosion."

Section 4.1.1.1 states: "Soil subsidence, a form of subsidence associated with surface flow and erosion processes, could occur at the site through the development of soil pipes, or voids in the soil. However, no soil pipes have been discovered to date, and the engineered cell would control surface flow to prevent the development of soil pipes and subsequent soil subsidence adjacent to the cell."

A systematic evaluation of geology and soil processes that could affect the site are detailed in Section 4.1.1 (Geology and Soils). DOE does not believe the off-site pipe mentioned in the comment represents a significant geologic hazard at the Moab site.
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Document #127 Comment #3 Commentor: McCleary, Jeff and Wren

3) The draft EIS lacks a systematic discussion of the “Features, Events, and Processes (FEP’s)” that will impact the ability of the current site to contain and isolate the waste. The FEP’s methodology has been used extensively at other DOE radioactive waste sites and would be appropriate here. Features would include items such as breccia pipes, which are evidence of past, localized collapse, and faults, across which there can be differential subsidence due to dissolution. Processes would include the migration of the river across its floodplain and ongoing dissolution of the salt that underlies the pile. Events would include local events such as seismic events, as well as regional or global events such as climate change. DOE documents developed for other radioactive waste sites indicate climate change in the next 600 to 1000 years; bringing the likelihood of larger floods and greater erosion.

Response:

Sections 3.1.1 and 4.1.1 of the EIS present a systematic discussion and evaluation of geologic features, events, and process that could affect the site.

For example, with regard to pipes, Section 3.1.1.4 states: “Piping and rapid erosion may occur in fine-grained soils and unconsolidated fine-grained sediments at the site along the ephemeral stream channel of Moab Wash. The piping can occur when water from storms flows into permeable, noncohesive layers, removes fine sediments, and exits where the layer reaches the surface (Doelling et al. 2002). The void space created is a pipe that promotes accelerated erosion.” Section 4.1.1.1 states: “Soil subsidence, a form of subsidence associated with surface flow and erosion processes, could occur at the site through the development of soil pipes, or voids in the soil. However, no soil pipes have been discovered to date, and the engineered cell would control surface flow to prevent the development of soil pipes and subsequent soil subsidence adjacent to the cell.”

With regard to river migration, Section 4.1.17 and Section 2.6 of the EIS discuss the potential for the Colorado River to migrate and damage the tailings pile if the tailings were not relocated. There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these opposing views (Section 2.6.4). If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials would be sized to exceed the maximum river forces recently identified by USGS and that the barrier wall would be of sufficient length to prevent river migration into the pile. The final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan if the on-site alternative were selected. The estimated cost range for remediation (shown in Table 2−33, item #9) would accommodate materials consistent with the recent USGS report.

Document #127 Comment #3 - response continued

Section 4.1.17 of the EIS addresses a failure of a disposal cell at the Moab site and the expected consequences and potential risks. These would include impacts to downstream users, aquatic receptors, backwaters, terrestrial biota, and adjacent areas. The focus of the analysis is to evaluate the potential consequences of contaminants in the water and sediments of the Colorado River based on a significant (catastrophic) release of tailings. Although the probability of a significant release would be very small over the design life of the on-site disposal cell, this type of failure was assumed to occur in order to evaluate the potential consequences (risks).

With regard to salt dissolution, the EIS acknowledges that this process would result in the tailings coming into permanent contact with ground water in 7,000 to 10,000 years under the No Action or on-site disposal alternatives.

With regard to earthquakes, DOE does not agree that seismic issues are a significant concern at the Moab site. The seismic characteristics of the Moab site are addressed in Section 3.1.1.4 of the EIS. In the vicinity of the site, the Moab Fault consists of two branches: the main Moab Fault and the west branch of the Moab Fault. No historical macroseismicity has been noted along the Moab Fault, and microseismicity studies have not revealed any earthquakes associated with the fault. The site area is in Uniform Building Code 1, indicating lowest potential for earthquake damage. A concentration of seismicity was evaluated in a probabilistic seismic hazard analysis by Woodward-Clyde Federal Services (Woodward-Clyde 1996b). On the basis of that analysis, the recommended design-peak horizontal acceleration was 0.18g. For a 10,000-year return period for a strong earthquake, this value provides the level of protection equivalent to the extent practicable as specified in 10 CFR 100, "Reactor Site Criteria." For these geologic and geophysical reasons, the Moab Fault system is not a capable fault and does not pose a significant earthquake or surface-rupture threat to the present tailings pile.

With regard to climate warming, while acknowledging that climate warming is real, DOE does not believe reliable data exist to predict its impact on the Colorado River upstream from the Moab site. Moreover, based on a very conservative analysis, the EIS concludes that flooding erosion and flooding impacts would not be a serious concern under the on-site disposal alternative.

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Document #127 Comment #4 Commentor: McCleary, Jeff and Wren

4) On page 3−6 the draft EIS makes the statement that the site area is covered by alluvium of the Colorado River that is approximately 20 feet thick. I fully agree with that statement. That statement is also 100% in agreement with the data from the Grand County sediment study submitted to the NRC in 1996. However, that statement contradicts DOE's contention that sediment from Moab and Courthouse Washes has overpowered the Colorado River and pushed it to the south away from the pile. The Colorado River is bedded in alluvium in the Moab Valley, and alluvial-bedded rivers migrate across their floodplains. The Colorado River terrace remnant north of the river on the east side of the Moab Valley also demonstrates that the river has migrated in the geologically recent past.

Response:

See response to comment #1.
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Document #127 Comment #5 Commentor: McCleary, Jeff and Wren

5) Figure 3−1 has been generalized to the point of uselessness. Igneous rocks are incorrectly shown outcropping in Spanish Valley, some anticlines have been linked and others omitted, and none of the information is referenced as to its source so there is no traceability as to where this information came from. Unfortunately, this figure is typical of the document as a whole. The referencing of source information is so poor that the draft EIS must be considered sub-standard. The result is that many of the statements in the draft EIS are reduced to unsupported assertions about the geology and hazards at the site.

Response:

DOE believes the level of detail, accuracy, and traceability of geologic characterizations found in the EIS, as a whole, are adequate to support the decisions to be made. The commentor is correct that the purpose of Figure 3−1 is to generalize the structural setting of the Moab site. The igneous rocks are the La Sal Intrusive, and only the general location is shown. For a detailed evaluation of geologic and soil processes that could affect the site, see Section 4.1.1 (Geology and Soils).
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Document #127 Comment #6 Commentor: McCleary, Jeff and Wren

6) An objective analysis of the current location of the tailings, perhaps facilitated by a "Features, Events, and Processes (FEP's)" methodology, would likely demonstrate that the site is not suitable for the construction of a disposal cell. The tailings should be relocated to a Mancos Shale area to the north by rail or slurry line.

Response:

DOE believes the EIS provides an objective analysis of the current location of the tailings. A systematic evaluation of short-term and long-term impacts that could affect the site is detailed in Chapter 4.0 (Environmental Consequences) of the EIS. Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.
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Document #136 Comment #1 Commentor: Lippman, Robert—Castle Valley Town Council

These are general and conceptual comments on the DEIS regarding remediation alternatives for the Atlas uranium tailings located along the Colorado River near Moab, Utah.

1. The matter should have been resolved and remedied decades ago; each month of delay increases the ultimate costs of remediation, and studying the matter endlessly will not change the most basic observations and essential conclusions that are to be drawn. Several dozen other tailings sites in the Colorado River drainage have already been moved, and yet this high priority site still awaits remediation.

Response:

DOE is working as expeditiously as possible to reach a final decision for remediation of the Moab site. The complexity of the issues to be examimed, combined with the need to involve the public, federal and state agencies, and tribes in this process, requires thorough and thoughtful examination. In the interim, DOE has taken measures to mitigate impacts until a final decison is reached.
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Document #136 Comment #2 Commentor: Lippman, Robert

2. The placement of the tailings and their ongoing impacts upon air and water quality, and on human and non-human health and well being, have permissively violated a myriad of Federal pollution control laws and regulations, along with defying common sense. These impacts are not limited to local effects, but extend regionally and downstream, potentially affecting the health and well being of tens of millions of Americans and Colorado River water users (culinary, agricultural, recreational), and the integrity of a vast percentage of America's agricultural production of 4-season produce. There are also international and treaty implications to the downstream movement of pollutants from the tailings. The site is also the source of social, economic and aesthetic impacts on the residents and well being of the Moab area, and the remediation plan needs to ensure the least disruption of local amenities.

Response:

DOE is managing the existing site in full compliance with the requirements of 40 CFR 192 and all other applicable federal and state regulations. The EIS identifies the on-site disposal alternative as being a reasonable alternative that would be able to meet the protective criteria promulgated in 40 CFR 192. Consequently, air quality, water quality, and human and nonhuman health and well-being, both locally and downstream, would be protected under this alternative. The Department has presented the uncertainties associated with this alternative to support informed decision-making. DOE is aware of no evidence supporting the view that mobilization and transport of contaminants across international borders has occurred, is occurring, or would occur under any credible pile failure scenario under the on-site disposal alternative. A discussion of the basis for DOE's identification of its preferred alternatives is provided in Section 1.4.
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Document #136 Comment #3 Commentor: Lippman, Robert

3. Long term containment of the tailings is impossible in the present floodplain of an active hydrological (and uncertain geological) system. The inconsistencies and contradictions in government studies raise sufficient uncertainty to warrant moving the pile regardless the statistical cost-benefit estimates. Cyclical flooding and river channel migration will ultimately have a direct impact on the pile, in addition to the present and ongoing effects and releases of harmful materials.

Response:

The Department agrees that at some point in the future, especially considering geologic time, the river will cross the Moab site. The Department's analyses conclude that engineering controls can be used to resolve this issue for the near term (200 to 1,000 years). However, in Section 4.1.17, a catastrophic failure of an on-site disposal cell is assumed and the impacts are quantified. Additionally, the impacts of periodic flooding are assessed in Section 4.1.3.1. If on-site disposal were selected, the cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell. Further discussion of the differing opinions over river migration is included in Section 2.6.4.
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Document #136 Comment #4 Commentor: Lippman, Robert

4. Capping the tailings in place will do nothing to remedy the present and long term groundwater and surface flow contamination situation, and the site would still be subject to hydrological and geological forces and changes; the "no action" alternative will further allow ongoing public exposure to radon and hazardous particulate matter, in addition to the groundwater and river flow impacts.

Response:

Results of DOE's contaminant transport and ground water flow computer modeling indicate it would take approximately 75 years for the ground water to passively clean itself to levels that would be protective in the adjacent surface waters if the pile were relocated. If the pile were stabilized in place, it would take 5 years longer, or approximately 80 years, to reach the same level of protection. In the meantime, the Department would perform ground water remediation activities to maintain protective levels in the river until the 75- to 80-year period was reached. DOE acknowledges in the EIS the potential for the pile to be inundated during flood events. If the on-site disposal alternative were selected, the side slopes would be protected by riprap, and the toe of the pile would be protected by an engineered barrier to river migration as described in the EIS (Section 2.1.4). While additional ground water contaminants would likely be released to the environment during 100-year or greater floods, the resulting impacts to human health and the environment would not be catastrophic and have been discussed in the EIS (Section 4.1.3.1).
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Document #136 Comment #5 Commentor: Lippman, Robert

5. The only rational and justifiable option for mandatory remediation is to

a. move the tailings by rail to a more stable and prepared site, north of Moab, avoiding disturbance to population centers, and eliminating the problems associated with using precious Colorado River water for such an enterprise, and the end problem of contaminated water at the new site;

b. reject the White Mesa slurry alternative due to the transferred impacts upon local, Native American communities and sovereign/trust lands (which also raises legal issues of environmental justice); and, continue remediation and future prevention plans for ancillary sites in the Colorado River Basin and regional drainages.

Response:

Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4.

With regard to remediation and prevention efforts for ancillary sites, the scope of this EIS is limited to the tailings, ground water, and vicinity properties in Moab, Utah, and does not include other sites. All other sites for which DOE has responsibility have been or will be assessed in separate NEPA documentation.

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Document #136 Comment #6 Commentor: Lippman, Robert

It is further urged that the DOE expeditiously implement the relocation plan, and ensure that adequate funding is made available for the project.

Response:

DOE is developing comprehensive and detailed budget baselines that will provide the appropriate funding requirements to the Secretary of Energy and Congress to achieve the project reclamation goals in a timely manner.

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Document #137 Comment #1 Commentor: Castle Valley Town Council

WHEREAS, The Town Council of Castle Valley, Utah shares the resolved concerns of the City of Moab Town Council, the Grand County Commission, the Utah State Legislature, and the White Mesa Ute Community of the Ute Mountain Tribe regarding the disposition and remediation of the Atlas Uranium Mill Tailings Pile; and

WHEREAS, The United States Federal Department of Energy has prepared a draft Environmental Impact Statement identifying and addressing options for remediation of the tailings pile which consists of approximately 12 million tons/8 million cubic yards of radioactive waste and other toxic materials, and which is located on a floodplain adjacent to the Colorado River at Moab, Utah; and

WHEREAS, The Town Council is concerned with the documented air and water quality impacts of the tailings pile on the general health, safety, welfare and recreation economy of Southeast Utah and its residents; as well as being concerned with present and potential water quality impacts and threats to the downstream environment, the health and safety of tens of millions of downstream water users, and the integrity of a significant share of the nation's produce grown from Colorado River water, especially given the real possibility of catastrophic flood, or migration of the river channel towards the tailings pile; and

Response:

The Department agrees that there is a real possibility that at some point in the future, especially considering geologic time, the Colorado River will cross the Moab site. However, the Department's analyses conclude that engineering controls can be used to resolve this issue for the near term (200 to 1,000 years). In Section 4.1.17 in the EIS, a catastrophic failure of an on-site disposal cell is assumed and the impacts are quantified. Additionally, the impacts of periodic flooding are assessed in Section 4.1.3.1. If on-site disposal were selected as DOE's final decision, the cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell. Further discussion of the differing opinions over river migration is included in Section 2.6.4.

==

Document #137 Comment #2 Commentor: Castle Valley Town Council

WHEREAS, because of the geologic complexity of the present tailings site and the historic, erratic nature of hydrological cycles of the Colorado River, there are serious uncertainties associated with the long-term integrity of the remediation-in-place alternative (“capping”); and

Response:

DOE acknowledges the commentor’s concerns regarding uncertainties and the complexity of the hydrologic cycles of the Colorado River and addresses these concerns in the EIS (Tables S−1 and 2−33, Consequences of Uncertainty).
==

Document #137 Comment #3 Commentor: Castle Valley Town Council

WHEREAS, the remediation option of removing the tailings pile by slurry line to an existing site at White Mesa, south of Moab, Utah, will severely impact the health, safety, welfare and culture of the White Mesa Ute Community of the Ute Mountain Tribe, and also raises unresolved questions about the contaminated slurry water and the propriety of using precious Colorado River water for such a purpose.

Response:

DOE agrees, and the EIS acknowledges, that the White Mesa Mill off-site disposal alternative would result in adverse cultural resource and environmental justice impacts. DOE does not agree that this alternative would necessarily cause adverse impacts to the health and safety of the White Mesa Ute community.

The comment does not specify what unresolved questions remain about the slurry water; therefore, this cannot be addressed. The propriety of DOE’s proposed used of Colorado River water is subjective; however, the use would be within the Department’s Colorado River water use rights.
==

Document #137 Comment #4 Commentor: Castle Valley Town Council

NOW THEREFORE, IT IS HEREBY RESOLVED THAT THE TOWN COUNCIL OF CASTLE VALLEY, UTAH, strongly supports moving the Atlas Uranium Mill Tailings Pile from the banks of the Colorado River, and that the Town Council urges the Federal Department of Energy to select its remediation option of moving the tailings pile by rail to a safer, more stable location to be selected north of the Colorado River, and to expeditiously implement it’s remediation plan for such action.

Response:

DOE has considered input from the public throughout the preparation of the EIS. This input has been instrumental in the identification of off-site disposal at Crescent Junction using rail and active ground water remediation as the Department’s preferred alternatives. DOE will continue to consider the comments received as it finalizes its decision.
==

Document #213 Comment #1 Commentor: Landa, Suzanne

Moving the Moab Uranium Mill tailings to a location where there is no potential for groundwater contamination is the only acceptable option. Cost should not be a factor when the results protect our ecological environment and assure safe household water for millions of people.

Response:

DOE acknowledges the commentor's views and will consider this and other opinions in its final decision-making.
==

Document #213 Comment #2 Commentor: Landa, Suzanne

The EIS indicates that as much as 80 percent of the pile could wash into the Colorado River during a severe flood. With the earth's climate changing, a severe flood occurring in the near future is likely. In San Diego, we don't know what affect the continued seepage or sudden release of toxic waste from this pile could have on our southern California lives. However, the adverse impact on plants and animals and on the health of people who live and work along the river is of concern to all of us.

Response:

DOE acknowledges the commentor's concerns. However, the EIS does not indicate that as much as 80 percent of the pile could wash into the Colorado River during a severe flood. Section 4.1.17 of the EIS, which addresses disposal cell failure, states that the probability of a significant release of contaminants would be very small over the design life of an on-site disposal cell. This type of failure was assumed to occur only to evaluate the potential consequences (risks). Side slope armament and a barrier wall included in the design of the on-site disposal alternative would help maintain the integrity of the pile during the regulatory time frame of 200 to 1,000 years. The severe 1984 flood caused no degradation of the existing tailings pile structure. Section 4.1.3.1 characterizes the predicted post-flooding discharges from the pile, which would not be expected to result in concentrations harmful to aquatic organisms or humans. Even under a highly unlikely catastrophic failure, discharge of 80 percent of the pile into the Colorado River would not extend impacts beyond a few miles downstream of the site (Section 4.1.17). The uncertainties of these conclusions and the resulting consequences are discussed further in Section 2.6.
==

Document #213 Comment #3   Commentor: Landa, Suzanne

The Colorado River is not only a critical ecological component of the Southwest; it provides the household water supply for 26 million American. In Southern California we have taken the availability of our fresh water far too lightly. The affects of this toxic seepage should be a wakeup call for all. I agree wholeheartedly with Mr. Richardson who said “The range in vision should be to the future and to protect a valuable water supply.” The Moab site must be cleaned up in a way that fully protects our water supply with no more delays.

Response:

DOE acknowledges the commentor’s concern regarding the long-term implications of this decision and the current and future importance of Colorado River water. Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively insulate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.
==

Document #213 Comment #4   Commentor: Landa, Suzanne

The relocation of the pile is preferable to capping in place in every respect except that it would cost more. The greater indirect costs imposed on other parts of society should be strongly considered when deciding on the remediation plan.

It’s time for our government to become accountable for its past and responsible for our future. “The pile” must be moved.

Response:

DOE will consider this and other opinions in its final decision-making.
==

Document #264 Comment #1 Commentor: Oblack, Denise

Our members have unanimously agreed to support an alternative that would move the pile from its present location on the banks of the Colorado River. The preferred permanent storage sites would be either Klondike Bluffs or Crescent Junction due to their remote locations and accessibility via rail cars.

Response:

The commentor's preference for relocating the tailings pile to the Klondike Flats site or Crescent Junction site by rail is noted.
==

Document #264 Comment #2 Commentor: Oblack, Denise

A slurry line option is opposed by our group due to its unnecessary waste of precious water resources.

Response:

DOE acknowledges the comment and will consider it in its final decision-making.
==

Document #264 Comment #3 Commentor: Oblack, Denise

UGO members are taking this stand to point out what they see as obvious … hazardous waste stored on the bank of a major river is a very bad idea. Catastrophic flooding on the Colorado River has happened in the past and it will happen again in the future. Many of our member companies and guides remember the huge run-off from the 1983-84 season which threatened to compromise Glen Canyon Dam. And, the peak flows that year were not even at the level that would be expected from a 100-year or 500-year flood. If the river can threaten a concrete dam structure, it is not a huge stretch of the imagination to think it could potentially affect a dirt pile next to its shore.

Another example of the destructive force that a river can wield occurred just a few weeks ago in southwestern Utah. The usually sedate Santa Clara River swelled from a flow of 5 CFS to 6500 CFS in just a matter of days, causing the destruction of nearly 20 homes. If something like this were to happen in the Colorado River drainage, some or perhaps all of the 13 million tons of highly toxic waste could be flushed downstream, which would contaminate the culinary water that 26 million downstream users depend upon, not to mention that this same water is used for agricultural purposes to grow much of our nation's produce.

Response:

In Section 4.1.3.1, the EIS acknowledges the potential for flooding of the tailings pile if the on-site disposal alternative were selected and quantifies the impacts that could result from such inundation. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. If on-site disposal were selected, the disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. Section 4.1.17 in the EIS addresses impacts from a catastrophic cell failure due to natural phenomena. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if on-site disposal were selected.

==

Document #264 Comment #4 Commentor: Oblack, Denise

To consider capping this pile in place would be highly irresponsible. In today's political climate of soaring deficits, concerns over the solvency of social security, and other weighty issues, it is important to consider the costs of remediation. But putting cost considerations ahead of health and safety concerns for our citizens is unthinkable, perhaps even criminal. In fact, the 1999 Floyd D. Spence Act that transferred responsibility for the Atlas Tailings Pile to the Department of Energy contained a provision requiring the DOE to move the tailings away from the banks of the Colorado River and to clean up the groundwater.

Response:

Cost is only one of the considerations in selecting the preferred remedy for the Moab site. All the impacts identified in Chapter 4 are given significant consideration in weighing the impacts, costs, and benefits of all alternatives. DOE maintains that it has appropriately executed the requirements of the Floyd D. Spence Act and NEPA in considering all reasonable alternatives, including on-site disposal.
==

Document #264 Comment #5 Commentor: Oblack, Denise

Of 21 similar tailings piles located throughout the nation, Moab's pile is the only one that has not been moved. Nine of these 21 piles were located in flood plains, a risk factor that contributed to their removal. Why should the Moab Tailings Pile be treated differently? It should not.

Response:

The NAS recommended that DOE use the same protocols at the Moab site that have been used at other UMTRCA sites; DOE did so. DOE considered numerous factors in its decision to move tailings piles out of floodplains at other such sites, among them the potential effects (positive and negative) to floodplains and wetlands. These same considerations were taken into account at the Moab site.
==

Document #264 Comment #6 Commentor: Oblack, Denise

The Utah Guides and Outfitters Association calls for the DOE for carry out the mandate as set forth in the 1999 legislation, to relocate the tailings to a suitable location that removes the threat to human health and safety from the events caused by a catastrophic flood event.

Response:

DOE does not agree that the legislation (the Floyd D. Spence National Defense Authorization Act for FY 2001) assigning responsibility of the Atlas millsite to DOE mandates relocation.
==

Document #269 Comment #1 Commentor: David

Reference the toxic waste dump near Moab Utah. Why not allow the toxic pile to filter into the river at a higher rate so then, with luck, we can kill off some more southern Californians and help the traffic problems here in southern california?

All the comments by the local politians seem to indicate that that would be the ideal solution to the problem.

Response:

Comment noted.
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Document #306 Comment #1 Commentor: Grand County Council

As elected officials for the citizens of Grand County, we are writing to ask the Department of Energy to move the contaminated uranium tailings pile from the flood plain of the Colorado River near Moab, Utah, to a safer location within our county boundaries.

Response:

DOE will give full and careful consideration to the county's views regarding relocating the pile in its decision-making.

==

Document #306 Comment #2 Commentor: Grand County Council

We have been working closely with the community, interested stakeholders and scientists to determine the best alternative for remediating this contaminated waste pile. After years of research, discussion and lobbying efforts, the final DEIS has been completed. While we appreciate all the efforts of the DOE Grand Junction in developing the DEIS, we must emphasize that we have serious concerns about any alternative that would leave the tailings pile in its present location. There are 26 million people who use water from the Colorado River for drinking and agriculture. In fact, it is this same water that irrigates the crops that feed our entire nation. If the worst should happen and the pile is compromised by a natural catastrophic flood or terrorist act on reservoirs upstream from the site, the damage to the American West and American agriculture could be immeasurable and irreversible. Details of our concerns are outlined in our formal response to the DEIS, which is attached. Based on all the uncertainties identified by the DOE in its document, it is the position of Grand County that the only acceptable alternative is to move the tailings pile.

Response:

DOE thanks Grand County for its expression of appreciation for the Department's efforts and would like to note the valuable contributions to the decision-making process that have been made by the continuing efforts of county personnel.

Section 4.1.17 quantifies the impacts of a catastrophic failure under the on-site disposal alternative even though the river velocities projected by the recent USGS studies, coupled with the side slope armament and river migration barrier, make catastrophic failure a highly unlikely event. The analyses show that the impacts of a catastrophic failure would not be detectable below Lake Powell, and even in Lake Powell would not be of sufficient concentrations to cause measurable effects on human health.

DOE is confident in the quality of the data used in EIS, the integrity of the analyses performed, and the adequacy of the EIS to support its decision-making. DOE will continue to give full and careful consideration to the county's views regarding relocating the pile in its decision-making.

==

Document #306 Comment #3 Commentor: Grand County Council

The Moab Site is the only radioactive tailings pile to remain on a waterway. All other similar sites have been relocated because they were deemed too dangerous to remain in place. It is clear that removing the pile to a safer location is the right thing to do. In fact, the Floyd D. Spence Act, passed by Congress in 1999, called for the removal of the site from the floodplain of the Colorado River.

Response:

There are several reclaimed uranium mill tailings piles that remain on waterways and are protective of human health and the environment. Some examples include the UMTRA Green River site, located on the Green River in Utah, and the UMTRA Shiprock site, located on the San Juan River in New Mexico.

The Floyd D. Spence National Defense Authorization Act for FY 2001 states in part that "The Secretary of Energy shall enter into arrangements with the National Academy of Sciences to obtain the technical advice, assistance, and recommendations of the National Academy of Sciences in objectively evaluating the costs, benefits and risks associated with *various remediation alternatives, including* removal or treatment of radioactive or other hazardous materials at the site [Section 3405 (i) – Remedial Action at Moab Site] …" [emphasis added]. Consequently, the Department has complied with the Floyd D. Spence Act by evaluating various remediation alternatives, including both on-site and off-site disposal.
==

Document #306 Comment #4 Commentor: Grand County Council

WHEREAS, the Atlas Uranium Tailings Pile, consisting of 8.9 million cubic yards of radioactive waste is located on the flood plain of the Colorado River, and

WHEREAS, the south bank of the Colorado River has since 1924 moved north, west and northwest away from Moab and towards the Atlas Tailings Pile; and

WHEREAS, the Utah State Geological Service data shows that the Colorado River is likely to continue to migrate north toward the Atlas Tailings Pile; and

Response:

DOE has examined historical information from aerial photographs and historical topographic-cadastral maps and concluded that the river channel has remained relatively stable for the last 120 years (DOE 2003b).

The NAS report to the Department, dated June 11, 2002, stated, "While one cannot predict the timing of river migration (over the coming millennia or in the next several decades), the committee sees it as a near certainty that the river's course will run across the Moab site at some time in the future, unless engineered barriers prevent it from doing so." The Department agrees with the NAS conclusion that at some point in the future, especially considering geologic time, the river will cross the Moab site. The Department's analyses conclude that engineering controls (see Section 2.1.1.1) can be used to resolve this issue for the near term (200 to 1,000 years). If on-site disposal were selected as DOE's final decision, the cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell. In addition, a new Section 2.6.4 (Responsible Opposing Views) has been added to the EIS. It includes a detailed discussion of DOE's view and responsible opposing views on river migration.
==

Document #306 Comment #5 Commentor: Grand County Council

WHEREAS, a Probable Maximum Flood (PMF) of 300,000 cfs could wash 20% to 80% of the Tailings Pile into the Colorado River, and

Response:

DOE analyzed the impact of a catastrophic flood event (300,000 cfs), which is the NRC-specified PMF, and determined that it would have serious adverse impacts on riparian plant and animal life and would affect the health and safety of residents along the river and of river guides. Such a flood event could also affect the tourist economy of Moab if users of the river corridor subsequently avoided the area. The consequences of catastrophic failure of a disposal cell at the Moab site are quantified in Section 4.1.17; that analysis demonstrates that the effects from such a failure would not be seen beyond a few miles downstream of the site.
==

Document #306 Comment #6 Commentor: Grand County Council

WHEREAS, the 21,100 sq miles of up-stream Colorado River drainage coupled with the possible failure of upstream dams creates a possible scenario for the Probable Maximum Flood that could contaminate the Colorado River affecting drinking water for 26 million residents as well as the irrigation water for some of America's most valuable lands and crops; and

Response:

See response to comment #5.
===

Document #306 Comment #7 Commentor: Grand County Council

WHEREAS, the catastrophic opportunity for such a flood can not be dismissed from consideration for the 1000+ years of Department of Energy's legal responsibility for the Atlas Tailings Pile; and

Response:

See response to comment #5.
===

Document #306 Comment #8 Commentor: Grand County Council

WHEREAS, Federal Code 10 CFR 1002.4 in compliance with the Floodplain Environmental Review Requirements for "the storage of volatile, toxic or reactive materials" in an area that has "even a slight chance of flooding" is prohibited; and

Response:

DOE believes the commentor intended to cite 10 CFR 1022 (Compliance with Floodplain and Wetlands Environmental Review Requirements), because 10 CFR 1002 deals with the Official Seal of the Department of Energy.

Language in 10 CFR 1022.4(c) indicates that critical actions may include, but are not limited to, "the storage of highly volatile, toxic, or water reactive material." However, these regulations do not prohibit a critical action in a floodplain. Although residual radioactive material regulated under the UMTRCA would not likely meet this definition, DOE weighed the potential for flooding in the EIS.
===

Document #306 Comment #9 Commentor: Grand County Council

WHEREAS, the Floyd Spence Act, 42 USC 7912 (f) (3) requires remediation of the Atlas Tailings Pile pursuant to section 3405 (i) of the Strom Thurmond National Defense Act for the fiscal Year 1999 (10 U.S.C. 7420; Public Law 105-261) to include: (B) "the removal, to a site in the State of Utah, for permanent disposition and necessary stabilization of residual radioactive material and other contaminated material from the Moab site and floodplain of the Colorado River."; and

Response:

Sectin 3403(a) of the Floyd D. Spence National Defense Authorization Act for FY 2001 states in part that "the Secretary of Energy shall enter into arrangements with the National Academy of Sciences to obtain the technical advice, assistance, and recommendations of the National Academy of Sciences in objectively evaluating the costs, benefits and risks associated with *various remediation alternatives, including* removal or treatment of radioactive or other hazardous materials at the site [Section 3405 (i) – Remedial Action at Moab Site] …" [emphasis added]. Consequently, the Department has complied with the Floyd D. Spence Act by evaluating various remediation alternatives, including both on-site and off-site disposal.
==

Document #306 Comment #10 Commentor: Grand County Council

WHEREAS, tailing piles that were mediated in place at Green River and Monticello after multiple failures caused by a lack of an effective liner and a porous basement structure were eventually moved from Colorado Drainage for reasons of safety; and

WHEREAS, there have been 8 UMTRCA sites located. in the Colorado River Drainage and all 8 have been removed to protect people and their environment; and

Response:

DOE acknowledges the historical facts cited in the comment and will consider these resolutions in its decision-making.
==

Document #306 Comment #11 Commentor: Grand County Council

WHEREAS, a resolution was passed by the 1999 Utah State Legislature and signed by the Governor supporting the transfer of management of the Atlas Tailing Pile from the Nuclear Regulatory Commission who wanted to cap the tailings in place to the DOE in order to facilitate removal of the tailings to an environmentally safe location.

Response:

DOE will consider this resolution in its decision-making.
==

Document #306 Comment #12 Commentor: Grand County Council

NOW THEREFORE, BE IT RESOLVED THAT THE CITY OF MOAB, strongly supports moving the Atlas Tailing Pile from the unstable banks of the Colorado River to a safer more appropriate location so as to protect Moab City residents and environs, and the 26 million downstream consumers of the Colorado River Water; and,

Response:

DOE will consider the City of Moab's resolution in its decision-making.
==

Document #306 Comment #13 Commentor: Grand County Council

BE IT FURTHER RESOVED THAT THE CITY OF MOAB is adamantly opposed to the Atlas Tailings Pile being moved south by pipeline or truck. The White Mesa Mill site is the most expensive alternative site to the Moab site; White Mesa has the most problems with potentially polluting ground and surface water; and, there are numerous cultural sites that would be destroyed. Moab strongly objects to the transport of the 11.9 million tons of radioactive waste through the community.

Response:

The Department acknowledges the City of Moab's opposition to the Atlas tailings pile being moved south by pipeline or truck and to the transport of the 11.9 million tons of radioactive waste through the community. DOE will consider the city's resolution in its decision-making.
==

Document #306 Comment #14 Commentor: Grand County Council

WHEREAS, The Grand County Council is responsible for the Health, Safety and Welfare of the Citizens of Grand County;

WHEREAS, the Atlas Uranium Tailings, consisting of approximately 11 million tons of radio active waste or approximately 7.5 million cubic yards of contaminated material, has been situated on the Colorado River since 1956;

WHEREAS, Grand County stepped up to the plate and produced uranium for the U.S. during the Cold War in our Nation's effort to maintain its nuclear weapons stockpile;

WHEREAS, Grand County is dedicated to protecting the water users of the West by requesting that the Department of Energy move the tailings to a secured location within Grand County;

Response:

DOE acknowledges the facts cited in the comment and will consider the Grand County's request in its decision-making.
==

Document #306 Comment #15 Commentor: Grand County Council

WHEREAS, in the 1999 General Session of the Utah State Legislators a Resolution was passed and signed by the Legislatures and Governor in support of transferring management of the Atlas Tailings from the Nuclear Regulation Commission to the Department of Energy in order to facilitate removal of the tailings to an environmentally preferred location;

Response:

DOE acknowledges the facts cited in the comment and will consider the Grand County's views in its decision-making.
==

Document #306 Comment #16 Commentor: Grand County Council

WHEREAS, the Floyd D. Spence Act of 1999 (B) stated... "the removal, to a site in the State of Utah, for permanent disposition and any necessary stabilization, of residual radioactive material and other contaminated material from the Moab site and the floodplain of the Colorado River;

Response:

See response to comment #9 regarding DOE's compliance with the Floyd D. Spence National Defense Authorization Act for FY 2001.
==

Document #306 Comment #17 Commentor: Grand County Council

WHEREAS, the interpretation of Federal Codes (10 CFR 1002.4) in compliance with the Flood Plain/Wetlands Environmental Review Requirements stated... "storage of highly volatile, toxic or reactive materials" in an area that has "even a slight chance of flooding" is prohibited;

Response:

See response to comment #8.
==

Document #306 Comment #18 Commentor: Grand County Council

WHEREAS, stability of the Colorado River is not a guarantee and thus there is a possible risk of the tailings entering the Colorado River;

Response:

The EIS acknowledges the potential for flooding of the tailings pile if the pile were capped in place and quantifies the impacts that could result from such inundation. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river (Section 4.1.3.1). As stated in the EIS, an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment during the regulatory compliance period of 200 to 1,000 years. These measures would reduce the already low probability of catastrophic failure of an on-site disposal cell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if this alternative were selected.
==

Document #306 Comment #19 Commentor: Grand County Council

WHEREAS, there have been 22 UMTRCA sites identified with the Moab site being the 23rd. Eight of these sites have been, located on the Colorado River or its tributaries and have been removed as a protection of the local environment. Clean up was considered necessary because there are more than 20 million Americans drinking water from the Colorado River;

Response:

DOE acknowledges the facts and concerns cited in the comment and will consider them in its decision-making.
==

Document #306 Comment #20 Commentor: Grand County Council

WHEREAS, nearly all of the Colorado River water is appropriated for some kind of human use whether it be drinking, agriculture or recreation;

Response:

DOE acknowledges the commentor’s concern regarding the multiple uses of Colorado River water and will consider this information in its final decision-making.
==

Document #306 Comment #21 Commentor: Grand County Council

NOW, THEREFORE, BE IT RESOLVED THAT THE GRAND COUNTY COUNCIL, STATE OF UTAH, in it’s duty to protect the citizens of Grand County will do all that it can to lobby the elected officials of the State of Utah, State of Nevada, State of Arizona and the State of California, as well as their citizens, to write letters or contact their representatives to encourage the Department of Energy to make the right decision and remove the Atlas Uranium tailings from the banks of the Colorado River.

Response:

DOE acknowledges Grand County’s resolution and the county’s prerogative to actively lobby elected officials and citizens to support its position and preference. DOE will consider this resolution in its decision-making.
==

Document #307 Comment #1 Commentor: Darke, John

I really would like to have a better picture of the process of supplementing the hearing pile the Moab site Moab at the Grand County Highway. A while back some boxes appeared, they were left in the vicinity I was standing by at the time uncertainty. Subsequently a binder, 3-ring binder, appeared. On a spine it was labeled Moab Cooperating Agencies Communication. The index has apparently not been updated. I think it might be helpful. That reading room is receiving a lot of attention from members of the public interest person that there be, and I'm sure you could work it out with the County, the capability at the Reading Room to (a) refile the records that have been utilized, (b) where records have been misfiled, that the [inaudible] be coordinated for some files and (c) that a Contractor person be present such that they can help the patrons who chose to avail themselves of the reading room can be assisted. We had the basic deep waste and we had a reading room with a contractor. I think it would be a good idea to try it again.

This is John Darke. I'm making an on the record comment. 69 Fed Reg 65426 of November 12, 2004, and 67 Fed Reg 70256 December 3, 2004. RE: Pertinent Federal Register Notices.

I would like to respectfully draw the attention of the decision-makers where they consider the draft Environmental Impacts Statement regarding radiation Uranium Mill Tailings, Grand and San Juan Counties, Utah, dated November 30, 2004. I would like to comment that specifically, the November 30 DEIS avoids, wherever possible, making quote "explicit reference by footnote to the scientific and other sources relied upon for conclusions" in the Environmental Statement. 40 CFR 1502.24, entitled Methodology and Scientific Accuracy, states "Agencies shall ensure that the professional integrity, including scientific integrity, of the discussions and analysis in Environmental Impact Statements, they shall identify and shall make explicit reference by footnote to scientific and other sources relied upon for conclusions in the statement………….. continuation from ……………, this is John Darke….D..A..R..K..E. I was citing 40 CFR 1502.24 entitled Methodology and Scientific Accuracy. And that criteria states "Agencies shall ensures—error, ensure—that the professional integrity, including scientific integrity, of the discussions and analysis in Environmental Impact Statements. They shall identify and shall make explicit reference by footnote to scientific and other sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an Appendix." I have exercised due diligence in reviewing as many DEIS mentioned official records as possible and other records. Given the suspense, February 18, 2005, applicable to the present public review process. I have on many occasions found that statements made in the November DEIS were not properly substantiated by explicit reference emphasis at 40 CFR 1502.214 as cited above often the threat of DOE staff or Contractor claimed substantiation has led to dead ends. It is too easy to get lost on the way to determining the veracity or competence of the subject. DEIS transparency is required where credibility is sought. In addition Title I of the Uranium Mill Tailings Radiation Control Act at 42 US 7901 et seq. points out that it is the Secretary's responsibility that records be made publicly available conveniently.

Response:

Each chapter of the EIS concludes with a list of references used in that chapter. In addition, where appropriate, specific reference citations are provided in the text of the document. All references used in the preparation of the EIS, technical reports, and documents that were incorporated by reference were placed in the DOE reading rooms located near the Moab site and alternative disposal sites.

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Document #344 Comment #1 Commentor: Huntsman, Jon M. Jr.—Governor, State of Utah

Thank you for the opportunity to provide comments on a significant project for the State of Utah, remediation of the Moab Uranium Millsite and Tailings Pile. I urge the U.S. Department of Energy (DOE) to remove the Moab Mill Tailings Pile from the banks of the Colorado River, transport the tailings to a repository to be constructed at Klondike Flats, clean up the remainder of the Millsite, and treat groundwater contamination at the site for the period necessary to ensure that contamination does not migrate offsite through groundwater or into the Colorado River in violation of Utah surface and groundwater quality standards. This work should be commenced immediately, and federal funding should be sought to complete the work as promptly as possible. Now is the time to act - to move the Tailings Pile.

Response:

DOE acknowledges the commentor's preference that the tailings pile be moved to the Klondike Flats site and that the ground water at the Moab site be treated. These preferences will be taken into consideration throughout the decision-making process.
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Document #344 Comment #2 Commentor: Huntsman, Jon M. Jr.

The State of Utah appreciates DOE's work in preparation of the Draft Environmental Impact Statement (DEIS), as well as the ongoing work to minimize contamination from moving off the Millsitc. However, it is clear that the Tailings Pile cannot be left in the floodplain of the Colorado River. Recent studies by the U.S. Geological Survey and the University of Utah, as well as the reviews by the Utah Department of Enviromnental Quality, document that the river has migrated historically within the floodplain and over geologic time and that the force of the river at both a maximum flood event and even a l00-year event will generate forces sufficient to erode the adjacent banks of the river and undercut the tailings pile. The National Academy of Sciences Committee also recognized the critical importance of that risk when it reviewed remediation plans for the site. Recent flooding in the St. George and Santa Clara regions of Utah also demonstrated the swift and immense force of moving water in the desert. We cannot afford to assume the risks associated with having uranium tailings strewn along river banks and bars of the Colorado River below Moab. Good science and good sense tell us the tailings must be moved.

Response:

The EIS acknowledges that the river has migrated within the floodplain over geologic time and that the force of the river at both a maximum flood event and even a 100-year event will generate forces sufficient to erode the banks of the river. However, the Department's evaluation of river conditions suggests that the dominant direction of river migration over the next 200 to 1,000 years will be away from the site. Neither the Department's evaluation nor the recent study by the USGS indicates that catastrophic failure of the disposal cell could result from a maximum flood event and even a 100-year event. The NAS noted that "…the committee sees it as a near certainty that the river's course will run across the Moab site at some time in the future, *unless engineered barriers prevent it from doing so*" [emphasis added]. Consequently, the EIS incorporates engineered barriers in the form of tailings cover, side slope riprap and a buried riprap barrier wall to ensure pile stability and reduce the already low probability of catastrophic failure of an on-site disposal cell. These measures would serve as protection should river migration begin to occur unexpectedly.

Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4.

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Document #344 Comment #3 Commentor: Huntsman, Jon M. Jr.

Furthermore, moving the uranium tailings to a constructed repository at Klondike Flats creates the smallest impact and the most reasonable expenditure of funds to solve the problem. The repository site at Klondike Flats has broad support from federal, state, and local agencies, and from local residents. Transportation along the existing rail line reduces transportation impacts. Removing the tailings from the banks of the Colorado River would eliminate the risk of river undercutting, remove the source of groundwater contamination, and reduce the time needed for treatment of contamination at the river's edge.

Response:

The EIS acknowledges that the Klondike Flats site is the least expensive off-site disposal alternative and has lower transportation risks. In addition, the EIS acknowledges that off-site disposal is anticipated to eliminate Governor Huntsman's concerns associated with the uncertainties identified under the on-site disposal alternative. However, the time required for long ground water corrective action is essentially the same for both on-site and off-site alternatives.

DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4.
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Document #345 Comment #1 Commentor: Hackley, Pam

Move the tailings out of the Colorado River floodplain; move them north to a site within Grand County. Find the best and most stable offsite location for burial and containment. It is time to move forward with resolving the tailings pile issue.

Response:

DOE will consider this comment in its final decision-making. Consideration of this and other comments, the analyses in the EIS, and the uncertainties has led DOE to identify off-site disposal and active ground water remediation as its preferred alternatives in the EIS.
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Document #345 Comment #2 Commentor: Hackley, Pam

Reasons Not to Cap the Tailings in Place (On site Disposal)

Capping in place is unwise because of the uncertainty of river changes over the short and longterm. The continued location in the floodplain will always be a potential environmental and human health threat. There is no risk assessment that can make capping in place acceptable. In a landscape that is new and as active as the Colorado Plateau, trying to predict long term geomorphic, climatic and other changes is arguably beyond any science or technology that we can bring to bear on this subject. In addition, I have concerns that any study can reliably predict and guarantee that capping in place will be an effective solution for 200−1000 years and beyond. DOE should include a discussion of Dr. John Dohrenwend's paper "Preliminary Review of the DOEs Assessment of Potential Flood Hazards at the Moab Project Site (Atlas Tailings Pile), no date."

Response:

The EIS assesses the impacts both from likely flooding and unlikely river migration under the on-site disposal alternative and will consider these consequences in its final decision-making. DOE considered the points made in Dr. Dohrenwend's paper, along with the scientific studies conducted by many other reputable sources (including studies and research conducted by other federal and state agencies and numerous contractors supporting DOE's efforts to remediate the Moab site). DOE has summarized Dr. Dohrenwend's paper in a new EIS section (Section 2.6.4) that includes responsible opposing views.
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Document #345 Comment #3 Commentor: Hackley, Pam

If capped in place, there is still potential for a future catastrophic failure of an engineered impoundment. DOE states that more studies would have to be completed to fully engineer capping and containment of the tailings. DOE states that if capped in place, the tailings may still have to be moved at great cost at some time in the future. It is arbitrary and capricious to buy a perpetual risk and doubled remediation costs. It is prudent and DOE's mandate to spend this time and money to move the tailings to a more safe place and clean-up the existing site and vicinity areas.

Response:

DOE acknowledges the potential for future failure in Section 4.1.17 of the EIS, although such an event is considered to be unlikely. DOE also sets forth uncertainties in Section 2.6.3 of the EIS. DOE's identification of off-site disposal at Crescent Junction and active ground water remediation as its preferred alternatives is largely based on the analyses in the EIS. DOE's final decision-making will also consider all of the analyses provided in the EIS.
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Document #345 Comment #4 Commentor: Hackley, Pam

DOE does not carefully and fully address the indirect impacts of potential failures of the capping-in-place alternative. Users include local residents who use the river for summer swimming year in and year out, river guides who make a living from the river, recreation visitors to Moab area, Canyonlands NP, Powell NRA, Page, Grand Canyon NP and all the downstream water users including citizens of Mexico.

Response:

Catastrophic failure of an on-site disposal cell, although highly unlikely, was assumed to occur; the impacts of such an event are quantified in Section 4.1.17.
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Document #345 Comment #5 Commentor: Hackley, Pam

Groundwater studies have not conclusively determined that capping in place would prevent future contamination of Moab/Spanish valley groundwater or prevent downstream pollutant migration in the Colorado. Dr. Kip Solomon's study points to the fact that tailings contaminated waters are already migrating under the river and impacting Matheson Wetlands. This raises the next question of potential to pollute the Spanish Valley aquifer which is not addressed by DOE.

Faced with these studies that do not concur with DOEs analysis, DOE should abandon its evaluation of hydrologic dynamics rather than find support for the capping in place alternative.

Response:

DOE's position is that contamination is not migrating under the river and affecting the Matheson Wetlands Preserve. However, there are responsible opposing views on the fate and transport of site-derived contaminants in ground water, which are discussed further in Section 2.6.4.
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Document #345 Comment #6 Commentor: Hackley, Pam

The extremely adverse health and environmental effects of radiation and radon exposure and effects of other contaminants in the tailings are known. If DOE includes the cap in place alternative in the final EIS, then DOE needs to describe the intensity of impacts more clearly, both at the site as well as downstream in the event of tailings failure into the Colorado. Capping in place would continue to expose residents of Moab and surrounding communities as well as visitors to the area. DOE states that radon would continue to emanate from a capped facility.

Response:

The health impacts under the on-site disposal alternative from both radiological and nonradiological contaminant exposures of workers and the public are analyzed in Section 4.1.15.
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Document #345 Comment #7 Commentor: Hackley, Pam

The short-term exposure risks to workers and public during tailings removal are acceptable to ensure that off-site stabilization in the long term would essentially remove health risks. DOE must pursue state-of-the-art technology for tailings removal that is as fully protective to workers, residents, and visitors.

Response:

DOE would use the most appropriate methods and technology to ensure that when the tailings are remediated, the actions would be protective to workers, residents, and visitors.
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Document #345 Comment #8 Commentor: Hackley, Pam

DOE does not clearly address the current stability of the pile. DOE admits that full characterization of the pile is incomplete in terms of layers, material sizes, water content, presence/absence of other contaminants/pollutants/hazardous materials.How likely is a failure due to saturation of the pile or river undercutting, or other phenomenon before or during remediation?

Response:

Based on DOE's experience with 22 other uranium mill tailings piles, the Moab tailings pile can be made sufficiently stable to meet the requirements of 40 CFR 192 and would be able to withstand the erosive and destabilizing forces of maximum credible earthquakes and a PMF.
==

Document #345 Comment #9 Commentor: Hackley, Pam

DOE's analyses under all resource topics, except possibly worker exposure to radon during remediation, indicates that the on site alternative would result in on-going adverse and significant impacts. Other studies and reports, including those by National Academy of Sciences and those funded through the Citizens Technology Assistance Program substantiate the uncertainties of leaving the pile in place.

Response:

DOE believes, and the EIS indicates, that on-site disposal could be implemented to comply with the requirements of UMTRCA and 40 CFR 192 without unacceptable adverse impacts on public health and safety and the environment. Section 2.6.3 identifies the uncertainties associated with the disposal alternatives, and Section 2.6.4 identifies responsible opposing views to those of DOE on several technical issues.
==

Document #345 Comment #10 Commentor: Hackley, Pam

"DOE intends to consider the results of the analyses provided in this draft EIS, the relative costs among the alternatives, and other factors, such as public and agency comments on this draft EIS (including the views of cooperating agencies), in determining its preferred alternative for the disposal cell location and remediation of vicinity properties... Several cooperating agencies have expressed preferences for off-site disposal. In some instances, the areas of controversy reflect an opinion on which of the alternative actions DOE should select as its preferred alternative. The State of Utah has stated that the tailings should be moved to an off-site location due to uncertainties in predicting river migration and the ability of on-site disposal to meet protective aquatic standards. The City of Moab and Grand County have stated that the tailings pile should be moved to Klondike Flats for aesthetic and other reasons. The Ute community expressed a strong preference that the tailings pile should not be moved to White Mesa Mill due to the high potential for adverse impacts to cultural resources, traditional cultural properties, and other impacts. As downstream users, the Town of Bluff also objects to disposal at White Mesa Mill." (page S−11)

Response:

The comment accurately reflects the EIS text. DOE will consider this issue in its final decision-making.
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Document #345 Comment #11 Commentor: Hackley, Pam

Further, DOE states "For example, the uncertainties surrounding the speed and direction of river migration are relevant to the on-site or No Action alternatives but are of no consequence to the off site disposal alternative because the pile would have been removed." (page 2−164)

Response:

The comment accurately reflects the EIS text. DOE will consider this issue in its final decision-making.
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Document #345 Comment #12 Commentor: Hackley, Pam

Further, Grand County Council, Moab City Council and the Town of Castle Valley have all passed Resolutions in February 2005 calling for the removal of the tailings from the Colorado River floodplain to a safe location within Grand County.

Response:

Comment noted.
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Document #345 Comment #13 Commentor: Hackley, Pam

Further the Floyd D. Spence National Defense Authorization for Fiscal Year 2001 Act states "Subject to availability of appropriation for this purpose, the Secretary shall conduct remediation at the Moab Site in a safe and environmentally sound manner that takes into consideration the remedial action plan prepared pursuant to section 3405(i) of the Strom Thurmond National Defense Authorization Act for Fiscal year 1999 (10 USC 7420 note; Public Law 105-261), including (A) groundwater restoration; and (B) the removal, to a site in the State of Utah, for permanent disposition and any necessary stabilization, of residual radioactive material and other contaminated materials from the floodplain of the Colorado River."

Response:

The Floyd D. Spence Act also states "The Secretary of Energy shall enter into arrangements with the National Academy of Sciences to obtain the technical advice, assistance, and recommendations of the National Academy of Sciences in objectively evaluating the costs, benefits, and risks associated with *various remediation alternatives*, including removal or treatment of radioactive or other hazardous materials at the site…" [emphasis added]. Consequently, DOE has complied with the Floyd D. Spence Act by evaluating various remediation alternatives, including both on-site and off-site disposal.
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Document #345 Comment #14 Commentor: Hackley, Pam

Further, the cap-in-place alternative does not meet the meaning or intent of NEPA (40 CFR Parts 1502.1) for "reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."

Response:

DOE disagrees with the comment and feels that consideration of on-site disposal as an alternative in the EIS is warranted.
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Document #345 Comment #15 Commentor: Hackley, Pam

Finally, DOE makes a strong and overwhelming case for off site disposal at Klondike Flats or Crescent Junction. DOE states "Under the on-site disposal alternative, the tailings pile would be a continuing source of contamination that would maintain contaminant concentrations at levels above background concentrations in the ground water and, therefore, potentially require the application of supplemental standards (institutional controls) in perpetuity to protect human health. Under the off-site disposal alternatives, contaminant concentrations in the ground water under the Moab site would return to background levels after 150 years, by which time active ground water remediation would have been complete and supplemental standards would no longer be needed. The tailings pile would not be a continuing source of contamination to ground water under the off-site disposal alternative." (page 2−118)

Response:

Regardless of whether, in the Record of Decision, DOE ultimately decides to relocate the tailings pile or cap it in place, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that comply with requirements in 40 CFR 192.
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Document #345 Comment #16 Commentor: Hackley, Pam

DOE must follow its own findings, agree with the majority of stakeholders, follow direction in Floyd Spence Act, as quoted above, as well as recommendations from the Executive Office during the NRC period. The cap in place alternative should be eliminated from consideration as an alternative.

Response:

The on-site disposal alternative has been retained for consideration as a reasonable alternative, consistent with the requirements of NEPA (40 CFR 1502.1). DOE maintains that it has appropriately executed the requirements of the Floyd D. Spence National Defense Authorization Act for FY 2001. All stakeholder and public comment will be given due consideration in the final decision-making process. DOE believes, and the EIS indicates, that on-site disposal could be implemented to comply with the requirements of UMTRCA and 40 CFR 192 without unacceptable adverse impacts on public health and safety and the environment for the minimum regulatory period of 200 to 1,000 years. Section 2.6.3 identifies the uncertainties associated with the disposal alternatives, and Section 2.6.4 identifies responsible opposing views to those of DOE on several technical issues.

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Document #345 Comment #17 Commentor: Hackley, Pam

Tailings Removal Alternatives

DOE must move the tailings to a more safe containment area. Safely transporting materials to protect worker and public health and prevent accidents and environmental degradation becomes paramount.

Response:

See response to comment #1.

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Document #345 Comment #18 Commentor: Hackley, Pam

White Mesa

Relocation to White Mesa site under truck or pipeline modes is not viable, economical, reasonable, or environmentally sound. This alternative does not meet the NEPA test for reasonable alternative (40CFR1502.1). Most of all, it threatens more people's health during the transportation and remediation phases. It is unacceptable to consider moving the tailings so near to the White Mesa Ute reservation, above the Tribe's protestations, and so near to residents of Blanding and Bluff.

Response:

DOE disagrees with the commentor's interpretation of NEPA in evaluating the reasonableness of the White Mesa Mill site as an alternative assessed in the EIS. The potential impacts of this alternative and associated transportation modes are provided in Section 4.4 and will be considered along with public comments in DOE's final decision-making.
==

Document #345 Comment #19 Commentor: Hackley, Pam

DOE states Environmental Justice: "Disproportionately high and adverse impacts to minority and low-income populations would occur under this alternative as a result of unavoidable adverse impacts on potential traditional cultural properties located on and near the White Mesa Mill site, the proposed White Mesa Mill pipeline route, White Mesa Mill." (page 2−162)

This alternative is untenable for other reasons, especially in light of more favorable aspects of moving the tailings north of Moab. These are mentioned in Table 2−132.

Response:

DOE has considered the unavoidable impacts associated with the White Mesa Mill alternative (such as the environmental justice impacts), other impacts analyzed in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS. Based on these considerations, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4. DOE will continue to consider these comments in its final decision-making.
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Document #345 Comment #20 Commentor: Hackley, Pam

Slurry option flaws

- building a leak-proof pipeline over incredibly rugged terrain
- potential for new water and wind erosion in a very fragile environment
- visual eyesore during construction and even after reclamation
- water consumption and adverse impacts on Colorado river users and minimum in-stream flows
- contaminated water disposal issues.

Response:

The potential impacts of transporting the tailings by slurry pipeline are included in the EIS and will be considered by DOE in its final decision-making.
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Document #345 Comment #21 Commentor: Hackley, Pam

Truck option flaws -Traffic impacts through Moab, Monticello Blanding and on Highway 191- the route can barely handle the mix of truck and tourist traffic as it is. The scenario shown for a nearly continuous stream of tandem trucks is not realistic or feasible.

Response:

The potential impacts of transporting the tailings by truck are included in the EIS and will be considered by DOE in its final decision-making.
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Document #345 Comment #22 Commentor: Hackley, Pam

DOE does not present IUC's business proposal for the White Mesa alternative for public review. Please make this available to the public. Please clarify that this alternative is not a speculative business option and subsidy for IUC. What guarantees, assurities, and bonds would DOE demand of IUC to protect the human and natural environment from operation activities or in the case of abandonment and bankruptcy.

Response:

IUC's proposal to DOE was placed in the public reading rooms during the comment period after removal of sensitive business information.
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Document #345 Comment #23 Commentor: Hackley, Pam

DOE must follow its own findings, agree with the majority of stakeholders, including the Ute Mountain Ute Tribe. The White Mesa alternative should be eliminated from consideration as an alternative.

Response:

The EIS identifies the White Mesa Mill site as a reasonable alternative that could meet the requirements of 40 CFR 192. The tribal and public comments received as part of the NEPA process are important to this decision-making process and will be weighed along with the environmental impacts and other pertinent considerations.
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Document #345 Comment #24 Commentor: Hackley, Pam

Crescent Junction and Klondike Flats

DOE must move the tailings north to either Klondike Flats or Crescent Junction alternative locations. In my statement at the Moab public hearing Jan 26, I suggested that the Klondike Flats site seems to be preferable. Since that time, I have looked more closely at the options as DOE has presented them and spoken with others more knowledgeable about the locations. It appears that the Crescent Junction site, although further from the pile, may have more advantages than the Klondike Flats site including more suitable burial area (deeper shales) for containment, more favorable quality and quantity of topsoil/cover material for revegetation, the geo-hydrologic structure and pathways would be more “stable and remote” over the very long term, the area is less likely to be used/disturbed and thus people would be less likely to be exposed (because it is not near higher use areas such as the County landfill, the airport, hikers and bikers.) The railline runs closer to the Crescent Junction site. Since it is closer to Green River, that town would likely benefit economically while impacts due to traffic on HWY 191 and into Moab and possibly housing pressures in Moab would be much less.

The biggest and certainly serious drawback is that the Crescent Junction site would obviously be closer to residents of that village and Thompson Springs. The difference in costs between the two sites seems insignificant.

More studies will be needed to assure the stability and containment potential as well as safety of either site.

Unfortunately the tailings are not benign and must be dealt with. DOE will have to accept some level of unacceptable impacts and irretrievable commitment of resources to move the tailings and get the clean-up job done as quickly as possible.

Document #345 Comment #24 - continued

Response:

The commentor's preferences are noted. Sections 3.2 and 3.3 of the EIS describe the affected environments of the Klondike Flats and Crescent Junction sites, including the hydrologic, geologic, and land use conditions. Sections 4.2 and 4.3 identify the impacts and consequences of the alternatives for each site, including land use. All these data have been included to support decision-making. Additional studies would be undertaken for the site selected for final remediation to ensure stability and containment potential as well as safety.
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Document #345 Comment #25 Commentor: Hackley, Pam

Water Rights

The quantities of water needed to achieve remediation under all the alternatives is staggering. For truck/rail or slurry options, uses will exceed DOE's current right. The upper Colorado River basin is still under adjudication. How will this factor into DOE decisions. The final EIS needs to address this issue more thoroughly, including how DOE will get more water, how up and downstream users will be affected, how withdrawals will affect groundwater when the River is reduced to minimal flows for extended periods, possibly continuously, for years.

Response:

DOE disagrees that projected water uses would exceed DOE's current water right. As stated in Section 3.1.7.4 (Surface Water Use), DOE's water rights (previously Atlas's water rights) allows for 3 cfs consumptive use and an additional 3 cfs nonconsumptive use. The estimated water use does not exceed these rights for any of the alternative actions (Section 4.2.12.1).

To the extent that Colorado River water use exceeds USF&WS protective limits, DOE would mitigate the unavoidable adverse impact with negotiated water depletion payments.
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Document #345 Comment #26 Commentor: Hackley, Pam

Associated Areas of Contamination

Is DOE confident that the extent of all “off site” contamination has been fully identified. Please clarify why not all of 130 sites would be targeted for remediation. Has the search to find associated contamination included Castle Valley, Castleton, establishments and residents upstream of or around Moab, Cisco, La Sal etc.? How will the agency deal with buildings that may have contaminated tailings incorporated into foundations or slabs?

Response:

The extent of off-site contamination would be determined through additional radiological characterization efforts. Only those sites that contain residual radioactive materials that exceed EPA standards would be targeted for remediation. Based on previous experience, DOE does not believe all 130 sites would exceed EPA standards; however, further characterization would demonstrate whether they do.

The EPA 1971 survey targeted primarily the City of Moab. DOE has not performed any further surveys other than at the Moab site. If a property owner could demonstrate that contaminated material might be on his or her property and that it might be tied to Moab millsite activities, DOE would consider surveying other properties outside of the inclusion survey area (Figure 2−7).

If foundations or slabs contained residual radioactive materials whose concentrations exceeded the EPA indoor standards, they would be remediated. However, remediation of the interiors of habitable structures does not always require removal. Instead, remediation could involve building plenum walls or insulating and ventilating crawl spaces if only the radon daughter concentration needed to be lowered.
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Document #345 Comment #27 Commentor: Hackley, Pam

Adequacy of the Analysis

DOE does not adequately explain or justify the conclusions concerning uncertainties: "With the exception of ground water modeling, should DOE's characterization, assessment, or assumptions prove incorrect, the resultant changes in impacts would not be of a significance that would affect the principal reclamation decision of whether to relocate the tailings from their current location." This statement points out that the level of intensity of impacts under most resource topics has been skimmed over or avoided. The result is that it is hard to weigh the differences among alternatives. Each topic should clearly identify the yardsticks used to measure impacts and at what levels the impact may be minor, moderate, major and significance.

Response:

Based on further consideration of the range of uncertainties, the newly added Section 2.6.4 (Responsible Opposing Views), and the EIS analyses, DOE no longer considers the uncertainties regarding ground water modeling as the only discriminator for decision-making and has deleted this text in Section 2.6.3 and in the Summary.

Given the range of alternatives, the transportation modes, and the borrow areas assessed in the EIS, DOE agrees that comparative evaluations among the alternatives is difficult; for that reason, summary comparative tables (Tables S−1and 2−32) have been provided. To aid in this comparison, DOE avoided potentially subjective qualitative calibration terms and has instead quantified impacts wherever possible.
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Document #345 Comment #28 Commentor: Hackley, Pam

Decisions to be Made and Actions to be Taken

Under the weight of DOE's own analysis and the overwhelming public and local and state governments response in favor of removal of the tailings north of Moab, DOE must select either the Klondike Flats or Crescent Junction alternative for off site disposal. Assuming that DOE does select one of these two off-site alternatives, I would ask that DOE continue or re-establish a broad and inclusive stakeholder group that can be partners with DOE in determining the final remediation plans that will be most protective of the environment and human health. It may even be appropriate to do this now and have a collaborative effort to complete the Final EIS and ROD.

Response:

Based on consideration of all the technical data, uncertainties, and comments on the draft EIS, the Crescent Junction site has been identified as the preferred disposal location. They also will be taken into consideration during DOE's final decision-making. The commentor's request that DOE continue or re-establish a broad and inclusive stakeholder group that can be partners with DOE in determining the final remediation plans is noted. It is not known at this time what role stakeholders will have in determining the final remediation plans.
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Document #346 Comment #1 Commentor: U.S. Nuclear Regulatory Commission

1. Figure 2−1 shows summary schedules of activities for on-site and off-site disposal.

a. The schedules show “Characterization/Design/Bidding” beginning as soon as the Record of Decision is issued. Does the U.S. Department of Energy (DOE) need an appropriation from Congress before it can begin those activities? If so, the time to obtain the appropriation should be factored into the schedules.

b. “Characterization/Design/Bidding” is shown on the schedules as requiring 2 years to complete. There is no discussion in the text regarding the details of this phase. Presumably, DOE’s preparation of the Remedial Action Plan (RAP) and the U.S. Nuclear Regulatory Commission’s (NRC’s) review and concurrence with it, are included in the 2 years. How long will it take DOE to prepare the RAP? How long does DOE expect it to take to obtain NRC’s concurrence? Note that on many previous Title I projects, because of revisions needed as a result of NRC’s initial review, it took longer than 2 years to obtain NRC’s concurrence on the RAP.

c. How long does DOE expect the site characterization portion of “Characterization/Design/Bidding” to take? Shouldn’t there be a difference in the time required for characterization of licensed sites (Moab and White Mesa), with much existing data, and new sites (Crescent Junction and Klondike Flats)?

Response:

1a. DOE has requested funding for FY 2006 through the budget formulation and approval process. The FY06 budget is targeted at $28 million. Should this funding be available on or shortly after October 1, 2005, there would be no delay of schedule due to funding limitations.

1b. DOE’s preparation of the remedial action plan and the NRC’s review and concurrence are included in the 2-year schedule. This could be viewed as aggressive; however, DOE plans to conduct some tasks in parallel. DOE estimates it would take approximately 1 year to prepare the remedial action plan and approximately 1 month to obtain NRC concurrence. DOE recognizes that some previous remedial action plans have required longer duration for reviews, revisions, and approvals, and that this schedule may be optimistic; however, DOE would apply its lessons learned from earlier UMTRA experiences with remedial action plans to streamline the approval process with NRC in an effort to maintain the Department’s commitments to an aggressive remediation effort.

1c. The planned time for characterizing new sites (Crescent Junction and Klondike Flats) to provide needed information for detailed design needs is estimated to be less than 1 year. This activity would be performed in parallel with other required tasks necessary for project start-up.
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Document #346 Comment #2 Commentor: U.S. Nuclear Regulatory Commission

2. On p. 2−7, the Draft Environmental Impact Statement (DEIS) states, "DOE would also perform flood analyses at Courthouse Wash to determine the best alignment and design requirements." Is DOE considering realigning Courthouse Wash? If so, the EIS should provide the justification and discuss the impacts.

Response:

DOE is not considering realigning Courthouse Wash. Section 2.1.1.1 has been corrected to reflect Moab Wash.
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Document #346 Comment #3 Commentor: U.S. Nuclear Regulatory Commission

3. On p. 2−34, the DEIS discusses drying of tailings prior to truck or rail transport under off-site disposal options. The DEIS does not, however, discuss the potential for additional contamination to seep into the ground water from the drying tailings. Note that a significant fraction of the existing uranium contamination in the ground water at the site resulted from seepage from the ore stored onsite prior to its processing in the mill. Sections 4.2.3, 4.3.3, and 4.4.3 should address this potential impact.

Response:

DOE recognizes the potential for contamination to seep into the ground water from drying beds. This drying method was assessed in the EIS to provide the upper bound on possible air emissions as they would impact workers and the public. Section 2.2.1.2 has been revised to indicate that the actual method of drying would be developed as part of the engineering design after the Record of Decision and would include controls to prevent contamination of the soils and ground water. Conventional engineering solutions, including a liner for the drying bed or a mechanical system such as a press or centrifuge, would be considered.
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Document #346 Comment #4 Commentor: U.S. Nuclear Regulatory Commission

4. On p. 2−114, DOE states that removing tailings to the Envirocare site" would require an amendment to the existing license from NRC..." Note that effective August 16, 2004, NRC transferred its authority with respect to Envirocare (and other 11e.(2) byproduct material facilities) in Utah to the State.

Response:

Section 2.5.2.1 has been updated to reflect this regulatory change.
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Document #346 Comment #5 Commentor: U.S. Nuclear Regulatory Commission

5. On p. 2−132, Figure 2−58 shows latent cancer fatalities (LCFs) for workers for the various disposal options. For the on-site option, the figure shows LCFs to be much less than 0.1 for "Moab site workers" but also shows LCFs of almost 0.3 for "disposal site workers." What does that mean for on-site disposal, i.e., how are "disposal site workers" different than "Moab site workers" for the on-site disposal option? Additionally, the LCFs for "disposal site workers" for off-site disposal options are about 0.4. However, disposal at Moab will involve putting relatively low activity soils in the pile and some moving of the contaminated material on the top of the pile, while disposal for the off-site options will involve handling all of the material including the most radioactive materials. The EIS needs to explain the counter-intuitive conclusion that the latter will result in LCFs that are only 25 percent higher than the former.

Response:

In Figure 2−58, for the on-site disposal alternative, the bar labeled "disposal site workers" should have been labeled "Moab site workers." This has been corrected in the final EIS. In addition, the worker exposure analyses in the EIS have been revised to more clearly differentiate between the on-site disposal option and the off-site disposal options. The revised impacts are presented in Section 4.1.15 of the EIS and are summarized in Section 2.6 of the EIS.
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Document #346 Comment #6 Commentor: U.S. Nuclear Regulatory Commission

6. Tables 2−35 (p. 2−180) and 4−8 (p. 4−40) provide information on the costs of the various options. The costs are, presumably, DOE's best estimates, but there must be significant uncertainty in at least some of the estimates. It would be helpful if the uncertainties for the estimates were also provided. One would expect the uncertainties to vary by the component in Table 2−35 and by the site. For example, site characterization is shown to cost $1.6 million at all sites (the EIS should explain why the costs are estimated to be the same at Moab and White Mesa, where extensive site characterization data already exists, as at Klondike Flats and Crescent Junction, which have not yet been characterized). One would expect the uncertainty in site characterization costs to be greater at the sites that have relatively little site characterization data. As another example, one would expect the uncertainty in tailings handling costs to be greater for the off-site disposal options than for the stabilization in place option, since less is known about the deeply buried tailings that would have to be handled under the off-site disposal options.

Response:

The uncertainties associated with the cost estimates identified by the commentor are addressed in Section 2.7.3 through the addition of a 10-percent contingency on the total project estimate and the qualification that the budget estimate is expected to fall within the range of -15 percent to +30 percent. It is true that the cost uncertainties for individual components of the various alternatives vary. However, given the preliminary and pre-conceptual nature of the alternatives design, it is not practical or meaningful to develop quantitative uncertainty ranges on all the individual components. Therefore, the cost estimates as presented are considered to be adequate and appropriate to support decision-making for the NEPA process. To address the first example in the Comment: the $1.6 million estimated for site characterization was applied to all sites because, although differing among alternatives, additional site-specific information would still be required. As this cost is less than 1 percent of the total cost estimate, additional precision was not deemed necessary for this estimate. To address the second example in the Comment: cost differences for tailings-handling costs between on-site disposal and off-site disposal alternatives are reflected in Table 2−35 and range from approximately $4.7 million for on-site tailings handling to $110 million to $198 million for off-site tailings handling, and uncertainties are addressed by the 10-percent contingency.

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Document #346 Comment #7 Commentor: U.S. Nuclear Regulatory Commission

7. On p. 4−10, the DEIS presents a discussion of potential impacts, with respect to potential ground water contamination, of a 100-year flood on the Colorado River. The DEIS estimates that as a result of flood water inundating the tailings pile during the flood, over 4 million gallons of contaminated water would drain from the pile at an average rate of 307 gallons per minute (gpm) over 10 days. No details of the analysis are provided.

The DEIS needs to provide the technical basis for the estimates provided. First, there does not appear to be a mechanism to get that volume of river water into the pile. The side of the pile will be protected by a clay layer with a permeability of 10^{-8} cm/sec and the bottom of the pile, while not as impermeable, also has low permeability. The 1984 Colorado River flood, that is used as the model for the 100 year flood, only rose about 4 feet up the side of the tailings pile, so the head to drive water into the pile is not great. Additionally, estimates of leakage from the bottom of the pile during mill operations were somewhat above 100 gpm. At that time there was a full pool of water on the top of the pile, so the head driving the water seepage was much greater. It therefore seems unlikely that the pile can drain at a rate of 307 gpm.

Response:

The commentor is correct that the DOE drainage seepage rate is conservative. Technical details regarding DOE's analysis are provided in the SOWP (Section 7.5.4). A very simplified analysis was performed in the SOWP as a screening step to evaluate the potential magnitude of a significant ground water rise caused by flooding in the Colorado River to determine if additional analysis would be warranted. Because the analysis was a worst-case scenario, and the ammonia concentrations were predicted to only slightly exceed 2 mg/L at the river, no additional analysis was deemed necessary.

Results of the simplified analysis may overestimate the 2-mg/L ammonia concentration by one to two orders of magnitude for two reasons: (1) the actual drainage rate would be much less than the 307 gpm, and (2) the ammonia concentrations in the seepage water would be much less than the assumed 1,100 mg/L. The actual drainage rate is overestimated because the analysis conservatively does not account for the low permeability of the pile's side slopes, which would be protected by a 1×10^{-8} cm/s clay layer, and the low permeability of the dense basal layer of the tailings. These low permeabilities would limit the volume of water into the pile. The analysis also conservatively assumes that the entire volume of water would equilibrate instantaneously to 1,100-mg/L ammonia while in contact with the tailings before draining. Therefore, it is highly unlikely that the ammonia concentrations would approach 2 mg/L at the river. The text of Section 4.1.3.1 has been revised to provide this clarification.

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Document #346 Comment #8 Commentor: U.S. Nuclear Regulatory Commission

8. On p. 4−12 the DEIS discusses storm water management. There is a brief statement that floods greater than the 25 year flood could result in tailings being carried into the Colorado River and that alternatives with site drying of tailings could result in more tailings being carried into the River. The same general statement is made for offsite disposal options (p. 4−64). In sharp contrast to the discussion in section 4.17 on disposal cell failure from natural phenomena, no details or analysis of the potential impacts to the River are provided. However, a storm or river flood overwhelming storm management features (which are only designed for a 25 year event) during construction and carrying tailings into the Colorado River is more credible than a catastrophic failure of the stabilized cell putting 20 to 80 percent of the tailings into the river. Additionally, the consequences of an event beyond the design for storm water management are different for on-site and off-site disposal options. Under the on-site option, only small amounts of primarily the less-contaminated material would be available to be washed into the River, while for the off-site option larger amounts of material, including the most highly contaminated tailings, could be affected. The EIS should provide a detailed analysis of a failure of the storm water management system, including potential consequences and clean up costs.

Response:

Sections 2.1.1.1, 2.2.1.2, 4.1.4.1, and 4.2.4.1 have been modified to reflect that the storm water management system would be augmented to address 100-year events. In addition, Section 2.2.1.2 has been revised to reflect that mountain snowpack and precipitation data would be monitored throughout the winter and spring seasons to track flooding potential so that appropriate site management and mitigation measures could be implemented promptly to ensure control of contaminants and protection of public safety and the environment during construction. Section 4.2.4.1 has been expanded to reflect that the greater flow velocities associated with a flood event through Moab Wash would have a greater ability to transport contaminants from the site to the Colorado River. In either case, the minimal amount of contaminants that could become suspended or dissolved into Colorado River or Moab Wash floodwaters during the completion of either on-site or off-site disposal would realistically be dispersed and diluted in the floodwaters such that there would be no significant measurable contamination in off-site sediment or river water.

Qualitatively, a substantial failure of the storm water pollution prevention system would reasonably occur only from a flood event greater than the 100-year return interval. As indicated by a recent USGS study (Initial-Phase Investigation of Multidimensional Stream Flow Simulations in the Colorado River, Moab Valley, Grand County, Utah, 2004, USGS Scientific Investigations Report 2005−5022), the overbank flow velocities associated with an event of this magnitude would be less than 2 feet per second. These velocities would have very limited ability to transport contaminants from the site and would likely result in net deposition of sediment. The minimal amount of contaminants that may become suspended or dissolved into these floodwaters during the completion of either on-site or off-site disposal would be dispersed and diluted in the floodwaters such that there would be no significant contamination in off-site sediment or river water. Because the storm water pollution prevention system would be designed for a 100-year event (a level typically applied for permanent civil structures), the duration of activities within the floodplain would be limited to a few years, and the velocities of floodwaters are projected to be low, a detailed failure analysis was not deemed necessary.

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Document #346 Comment #9 Commentor: U.S. Nuclear Regulatory Commission

9. On p. 4−33 the DEIS contains a discussion of the visual impact of the completed cell at the current site. It states that it does not meet BLM Class II objectives. However, on p. 4−25, the DEIS states that Grand County envisions future land use of the site (if tailings were removed) for low-density residences. The EIS discussion of visual impact should clarify that on-site stabilization would have less visual impact at the current site, than off-site disposal followed by residential construction.

Response:

DOE did not analyze a scenario in which residential construction would occur after remediation was completed at the Moab site. Section 4.1.8 states that Grand County, in its land use planning documents, has envisioned low-density residential use at the site. As discussed in Section 1.4.5, future land use of the site is highly speculative at this time; therefore, the visual impacts of uses beyond federal ownership have not been analyzed in the EIS.
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Document #346 Comment #10 Commentor: U.S. Nuclear Regulatory Commission

10. On p. 4−42 and in Table 4−10 the DEIS addresses radiation effects for the on-site disposal option and includes estimates of latent cancer fatality (LCF) risks to workers. The LCFs discussed in the text and shown in the table are the same as those in sections 4.2.15.1, 4.3.15.1, and 4.4.15.1 for workers at the Moab site for the three off-site disposal options. However, off-site disposal options involve significant handling of the most highly radioactive materials, while the on-site disposal option leaves those mostly undisturbed. The EIS needs to explain the apparently incongruous result that the LCF risks to workers handling mildly radioactive materials would be the same as the LCF risks to workers handling more radioactive material.

Response:

The worker exposure analyses in the EIS have been revised to more clearly differentiate between the on-site disposal option and the off-site disposal options. The draft EIS analyses used an overly conservative assumption that workers would be exposed to the same source terms for on-site and off-site disposal. Both the source term and duration of exposure have been reduced to more accurately represent expected conditions for on-site disposal. The revised impacts are presented in Section 4.1.15 of the EIS and are summarized in Section 2.6 of the EIS.
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Document #346 Comment #11 Commentor: U.S. Nuclear Regulatory Commission

11. On pp. 4−50 and 4−51 the DEIS discusses a catastrophic release of tailings and identifies several processes, but it does not discuss in detail how the identified processes could actually lead to a catastrophic release. The processes identified are:

Flooding - the DEIS does not acknowledge that large Colorado River floods are not erosive near the pile because the Portal downstream of Moab controls flow for this stretch of the River. In the event of a large flood, the area near the pile would be in backwater. It is difficult to see how this type of event would result in a catastrophic release of tailings.

River Migration - the DEIS correctly points out that this would be a slow process, if indeed it were possible (evidence indicates that migration will take the River away from the pile). The DEIS correctly states that failure of long-term management would also have to occur to have a catastrophic release of tailings. Thus two processes, each very unlikely, would have to both occur to cause a catastrophic release of tailings.

Seismic Activity/Basin Settling - in order for this process to lead to a catastrophic release of tailings, there would also have to be a major flood soon after an unlikely seismic event or there would have to be a failure of long-term management. Thus two processes, each very unlikely, would have to both occur to cause a catastrophic release of tailings.

Cap erosion/failure - this is identified as resulting in slow release of contaminants, rather than a catastrophic release.

The EIS should therefore highlight the conclusion that a catastrophic release of tailings, while theoretically possible, does not seem credible.

Response:

The conclusions in the EIS (Section 4.1.17, Disposal Cell Failure from Natural Phenomena, and Section 4.2.4.1, Construction and Operations Impacts at the Moab Site) have been clarified to state that a catastrophic release of tailings, while theoretically possible assuming a loss of management controls, is highly unlikely.
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Document #346 Comment #12 Commentor: U.S. Nuclear Regulatory Commission

12. On p. 4−54, Table 4−18 indicates that the concentration of radium-226 in the suspended load in the Colorado River following a catastrophic release of 20 percent of the tailings would be 944 pCi/g and would be 3776 pCi/g following a catastrophic release of 80 percent of the tailings. However, on p. 3−10, it is stated that the mean concentration of radium-226 in the tailings solids is 516 pCi/g. The EIS needs to explain this apparent inconsistency.

Response:

The average concentration of radium-226 reported in Section 3.1.3.1 of 516 pCi/g for tailings solids includes all particle sizes found throughout the pile, ranging from the fine-grained slimes to the coarser sands. In calculating concentrations for suspended load in the river, the particle size was assumed to be mainly finer-grained material, which typically has a higher concentration. The analysis in Section 4.1.17 was conservatively based on an elevated concentration of radium-226 in the slimes of 1,275 pCi/g identified in the NRC EIS (NRC 1999). However, an error in the application of these values has been corrected in Tables 4−18 and 4−19. This approach conservatively calculates a higher-concentration suspended load than what an average would be.
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Document #351 Comment #1 Commentor: Binyon, Jean—Sierra Club, Utah Chapter

The Preferred Alternatives which we advocate are to Move the Atlas Tailings pile and other contaminated materials to the Grand Junction Site by Rail. We further suggest that DOE select only those borrow materials sites which are north of the tailings pile.

Response:

Based on the analyses in the EIS, uncertainties associated with on-site disposal, and public comments, DOE has identified off-site disposal at Crescent Junction using rail transportation as its preferred surface remediation alternative for the Moab mill tailings. There is no disposal site alternative in Grand Junction, Colorado. In the EIS, all borrow sources that would be used for the Moab, Klondike Flats, and Crescent Junction alternatives, except NRC-qualified riprap, are located north of Moab.
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Document #351 Comment #2 Commentor: Binyon, Jean

We appreciate the opportunity to submit these comments and look forward to a favorable outcome with your issuance of the Final EIS on the Moab project.

Response:

DOE appreciates the commentor's participation.
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Document #351 Comment #3 Commentor: Binyon, Jean

The Draft EIS does not recommend preferred alternatives. The Utah Chapter Sierra Club respectfully recommends that the Atlas tailings pile, other millsite debris and contaminated vicinity property soils be moved from the Moab site to the Crescent Junction disposal site by rail. We further suggest that the best borrow areas would be those six which are located north of the Moab site, in order to eliminate unnecessary tandem truck traffic in downtown Moab.

Response:

Based on consideration of all the technical data, uncertainties, and comments on the draft EIS, the Crescent Junction site has been identified as the preferred alternative location. With regard to borrow areas, see response to comment #1.
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Document #351 Comment #4 Commentor: Binyon, Jean

The Cap-in-Place/On Site Alternative is not safe and/or suitable, for environmental, health, and socioeconomic reasons.

1) The Utah Chapter Sierra Club joins the following in urging that the tailings be moved:

    1. Utah former Governor Olene Walker in concert with Governors of California, Nevada, Arizona, and New Mexico
    2. Representative Jim Matheson, 2nd Congressional District of Utah
    3. Utah State Legislature (2002 General Session SJR 12)
    4. Utah Department of Environmental Quality
    5. Grand County Council
    6. City of Moab
    7. Town of Castle Valley
    8. The Times-Independent
    9. Grand Canyon Trust
    10. Nature Conservancy
    11. Living Rivers
    12. Southern Utah Wilderness Alliance
    13. Colorado Plateau River Guides
    14. Colorado Riverkeeper, an Affiliate of Waterkeepers Alliance
    15. Utah Guides and Outfitters
    16. Glen Canyon Group Sierra Club, and
    17. The majority of residents giving oral comments at the DOE Public Hearing January 26, 2005.

Response:

DOE will consider this comment in its final decision-making. After considering this comment and others, the analyses in the EIS, and the consequences of the uncertainties charcterized in the EIS, DOE has identified off-site disposal and active ground water remediation as its preferred alternatives in the final EIS.
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Document #351 Comment #5 Commentor: Binyon, Jean

2) Evidence offered by Dr. John Dohrenwend of the University of Arizona, questions the DOE's contention that the Colorado River is within a stable channel, and slowly migrating, if at all, southward and eastward, away from the tailings pile. Dr. Dohrenwend's studies show that the river's inner channel has, over the past 80 years, shifted closer to the pile and has become narrower and deeper. Indeed, according to recent letters to The Times-Independent, a dike or levee built by Atlas Minerals in the early '60's aided in the River's northward migration. From his extensive historical and current hydrologic and geologic studies, Dr. Dohrenwend concluded that the Moab site is not suitable for the long-term storage of the more than 11 million tons of hazardous waste.

Response:

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.

There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these opposing views (Section 2.6.4). If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration toward the pile begin to occur unexpectedly. The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials would be sized to exceed the maximum river forces recently identified by USGS and that the barrier wall would be of sufficient length to prevent river migration into the pile. The final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan if the on-site alternative were selected. The estimated cost range for remediation (shown in Table 2−33, item #9) would accommodate materials consistent with the recent USGS report.

Section 4.1.17 of the EIS addresses a failure of the disposal cell at the Moab site and the expected consequences and potential risks. These would include impacts to downstream users, aquatic receptors, backwaters, terrestrial biota, and adjacent areas. The focus of the analysis is to evaluate the potential consequences of contaminants in the water and sediments of the Colorado River based on a significant (catastrophic) release of tailings. Although the probability of a significant release would be very small over the design life of the on-site disposal cell, this type of failure was assumed to occur in order to evaluate the potential consequences (risks).
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Document #351 Comment #6 Commentor: Binyon, Jean

3) Evidence offered by Dr. Kip Solomon of the University of Utah, questions the DOE's contention that ammonia and uranium could not travel underneath the riverbed into the Scott Matheson Wetlands Preserve. To the contrary, he found that contaminated water is moving under the river to the south bank. Dr. Solomon is quoted as saying, "The tailings pile is literally a house built on sand. . . . If you leave those tailings in place they will end up in the Colorado." (The Times-Independent, Thursday, May 27, 2004)

Response:

DOE's position is that contamination is not migrating under the river and affecting the Matheson Wetlands Preserve. However, there are responsible opposing views on the fate and transport of site-derived contaminants in ground water. These opposing views are discussed in EIS Section 2.6.4.

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Document #351 Comment #7 Commentor: Binyon, Jean

4) The Multi-Dimensional Streamflow Simulation model being developed by the U.S. Geological Survey raises questions about DOE's assumptions regarding the extent of the floodplains and the likelihood that above-bank flows would be "dissipated in the Matheson Wetlands Preserve." As presented to the Moab Tailings Stakeholders Group Meeting January 14, 2005, the model illustrates the great complexity of stream flow as it is affected by both natural and man-made variables. The risks associated with the unpredictability of flooding makes it imperative that the tailings be moved.

Response:

DOE acknowledges the great complexity and dynamics of the Colorado River and the risks associated with the potential for flooding of the tailings pile under the on-site disposal alternative. The EIS quantifies the impacts that could result from such inundation in Section 4.1.3.1. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in the EIS, an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already highly unlikely possibility of a catastrophic failure of an on-site disposal cell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if on-site disposal were selected.

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Document #351 Comment #8 Commentor: Binyon, Jean

5) Point #10 of Table S−1--Catastrophic Floods focuses on the consequences of flooding for the Moab section of the river, probably understating the consequences for the 25-millions people and valuable agricultural production downstream. The Colorado River serves the entire southwestern United States and is of regional and international concern. A more adequate analysis of risks would look at the entire river system, from upstream reservoirs through Lakes Powell and Mead to the Gulf of Mexico. The value of a regional approach is obvious, as neither rivers nor groundwater respect state boundaries, and water is the limiting factor in the sustainability and even the survivability of most of the interstate region.

Response:

DOE acknowledges the great complexity, dynamics, and value of the Colorado River. In Section 4.1.3.1, the EIS acknowledges the potential for flooding of the tailings pile if the on-site disposal alternative were selected and quantifies the impacts that could result from such inundation. These impacts would include additional leaching of contaminants into the ground water and subsequent migration to the river. If on-site disposal were selected, the disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. Section 4.1.17 in the EIS addresses impacts from a catastrophic cell failure due to natural phenomena and addresses potential impacts as far downstream as Lake Powell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if on-site disposal were selected.
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Document #351 Comment #9 Commentor: Binyon, Jean

6) Since the collapse of the uranium mining and milling industry, the basis of Moab and Grand County’s economy has been tourism. The Atlas tailings are located at the “doorway” to Moab. A comparison of two simulated views in Volume I of the Draft EIS can serve to illustrate the very positive result, visually, of moving the tailings. These views are found in Figure 4−5 on page 4−33, and Figure 4−9 on page 4−77. Although it will take many years and a great deal of temporary disruptions to move the tailings, their removal to higher and safer ground will clearly be of benefit to the County’s socioeconomic wellbeing.

Response:

DOE will consider this comment in its final decision-making.
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Document #351 Comment #10 Commentor: Binyon, Jean

Costs

Most reviewers of the Draft EIS quote the costs figures given on page S−6 of the Summary document as conclusive, failing to recognize that these Surface Remediation Alternatives projections are only a part of the picture. The Ground Water Remediation costs (page S−9) will require appropriations regardless of the disposal and transportation alternatives chosen in the Final EIS. Vicinity property cleanup costs also enter the budget estimates.

Volume I provides details in 2003 dollars within a range of –15% to +30% beginning <u>after</u> the Record of Decision is issued. The Estimated Lifetime Cost of Analyzed Disposal Alternatives (Table 2−35 on page 2−180) shows a total cost of $248.8 million for the on-site alternative, not the $166 million often quoted in the Summary document. Included are costs beginning with site characterization through surveillance & maintenance, plus vicinity property cleanup and a contingency of 10%. The total cost of the alternative we have recommended—rail transportation to Crescent Junction, is estimated at $472.3 million, admittedly much greater.

Response:

The commentor's characterization of the costs identified for the various alternatives is essentially correct.

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Document #351 Comment #11 Commentor: Binyon, Jean

We question the assumption that the timeframe for ground water remediation should be the same, namely 75−80 years, for all disposal alternatives. Given the continuing source of contamination which would conceivably exist with the Cap-in-Place alternative, it is likely that such remediation would require more than 80 years. Since no precedent exists for remediating a uranium mill tailings pile in a floodplain, both longterm risks and costs are more speculative than for remediation off-site.

Response:

DOE remediated 22 millsites under Title I of UMTRCA. Three of the 22 sites (two at Rifle, Colorado, and one at Grand Junction, Colorado) were located adjacent to the Colorado River, and the tailings were removed from the floodplain. Of the other 19 Title I sites remediated by DOE, 10 were stabilized in place and 9 were relocated. For example, the disposal site at Green River, Utah, located adjacent to the Green River, which is a major tributary to the Colorado River, was stabilized on site. DOE is confident that the assumptions used to predict the remediation time frames and costs for remediating the Moab site are reasonable and sufficient for evaluating alternatives in this EIS.

Document #351 Comment #11 - response continued

DOE agrees that there are numerous uncertainties and assumptions, including long-term ones, that could potentially increase the duration of remedial action under the on-site disposal alternative and could therefore increase the lifetime cost of the on-site disposal alternative. In the EIS, DOE has described each recognized area of uncertainty and the potential consequences, including cost, where applicable (see EIS Tables S−1 and 2−33). In addition, in the final EIS DOE has added a new section (2.6.4) that addresses specific areas of uncertainty about which there are responsible opposing views.

In some instances it is not possible to quantify the potential impacts of areas of uncertainty on cost estimates. For example, one area of uncertainty frequently cited as potentially affecting the cost of the on-site disposal alternative is the applicable compliance standard for surface water ammonia and, by extension, how long ground water would have to be treated to achieve protective concentrations in surface water. In the EIS, DOE assumes that the lower end of the range of acute criteria (3 mg/L ammonia) applies. But if the more stringent lower end of the range of chronic criteria (0.6 mg/L ammonia) applies, it could significantly extend the duration of ground water remediation. The uncertainties associated with the cost, duration, and ability to achieve protective criteria in the surface water are dependent on multiple and potentially additive or offsetting factors. Such factors include variations in the composition of the tailings pore water; geochemical changes that occur over time; transport of contaminants to the surface water; changing regulatory criteria; and the evolving geologic configuration of the near-bank river system. Accurately quantifying the individual and collective uncertainties of these disparate factors would be an extremely complex exercise, and the value of the results in the decision-making process would likely be disproportionate with the required effort. Consequently, DOE acknowledges in the EIS that the estimated annual cost of ground water treatment ($906,000) and the cost of disposing of the resultant residual radioactive material could extend beyond the 80 years that DOE currently estimates for the on-site disposal alternative. Other areas of uncertainty where DOE acknowledges the potential to increase lifetime costs of the on-site disposal alternative include the ground water and site conceptual model assumptions and the extent of a postulated but as yet unconfirmed salt layer in the tailings pile. These are discussed in EIS Tables S−1 and 2−33. Finally, there are areas of short-term uncertainty that apply to the off-site disposal alternatives that could increase the estimated cost of these alternatives. Examples include the final mass and volume of contaminated material in and adjacent to the tailings pile, the depth of subpile contamination, and worker dose rates and exposure times. These are also discussed in Tables S−1 and 2−33 of the EIS.
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Document #351 Comment #12 Commentor: Binyon, Jean

It should be noted that Table 4−8 Remediation Costs on page 4−40 does include greater <u>annual</u> costs for ground water and post-remediation costs for on-site versus off-site disposal--$942,000 versus $933,000.

Response:

DOE acknowledges the comment. Table 4−8 does reflect this difference in ground water costs for the alternatives.
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Document #351 Comment #13 Commentor: Binyon, Jean

Regarding timeframe, compared to DOE's responsibility for 200 to1000 years, the 7 to 10 years for surface remediation and 75 to 80 years for ground water remediation represent a sound investment in time. We would argue that the greater cost for the much safer alternative of relocating the tailings from the Moab site to either site north of their current site is just such a sound investment.

Response:

See response to comment #4.
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Document #351 Comment #14 Commentor: Binyon, Jean

White Mesa IUC Site is unsuitable

Of the three off-site locations considered, the White Mesa site is the greatest distance from the Moab site and would require moving the tailings out of Grand County, either by truck via the already congested main street of Moab, or by slurry pipeline. Construction of the two buried pipelines, 89 miles long, under the Colorado River and across varied and undulating ground, and of pump stations and other necessary infrastructure, would cause both unacceptable environmental impacts and a long delay in actually moving the tailings.

Response:

The commentor's characterization of the scope of the proposed alternative is essentially consistent with the information presented in the EIS. However, the commentor's characterization regarding the acceptability of the potential impacts of this alternative and the schedule are not consistent with the information in the EIS. The schedule presented in Chapter 2.0 indicates that the time to complete the reclamation under the White Mesa Mill alternative would be comparable to the time frame for the on-site disposal alternative. In addition, no determination regarding the acceptability of potential impacts is made.
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Document #351 Comment #15 Commentor: Binyon, Jean

The following paragraph displays additional disadvantages of the slurry transportation mode.

The presence of archeological and other cultural sites at White Mesa as well as proximity of minority and low-income populations—an environmental justice concern, also make the site a poor choice. According to Sarah M. Fields in a June 2004 report on White Mesa, the IUC plant is located on the White Mesa Archeological District, which was found eligible for--tho' not officially listed on, the National Register of Historic Places. The Ute Mountain Ute, Southern Ute, and Northern Ute Tribes all oppose moving the tailings to White Mesa.

Response:

Disposal of tailings at the White Mesa Mill by slurry pipeline could adversely affect as many as an estimated 132 cultural sites eligible for inclusion in the National Register of Historic Places. In addition, representatives from the Ute Mountain Ute, Southern Ute, and Uintah-Ouray Ute Tribes have all opposed moving the tailings to the White Mesa Mill site. Because of these comments and the results of analyses provided in the EIS (including consideration of the consequences of the uncertainties characterized in the EIS), DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE will continue to consider these comments in its final decision-making.

==

Document #351 Comment #16 Commentor: Binyon, Jean

Slurry Pipeline and Truck transportation modes are unacceptable

As noted in most of the figures in the Summary Draft EIS, both slurry and truck are worse alternatives than rail.

Response:

The potential impacts of transporting the tailings by truck and pipeline are included in the EIS and will be considered by DOE in its final decision-making.

==

Document #351 Comment #17 Commentor: Binyon, Jean

<u>Slurry exceeds truck and rail</u> in Annual Withdrawals of Colorado River Water (Fig. S−4); Maximum Land Disturbance (Fig. S−5); Maximum Number of Potentially Affected Cultural Resources (Fig. S−6); Minimum Number of Potentially Affected Traditional Cultural Properties (Fig. S−7); Power Requirements (Fig. S−8); and Total Nonpotable Water Consumption (Fig. S−11);

Response:

See response to comment #16.

==

Document #351 Comment #18 Commentor: Binyon, Jean

Truck exceeds rail in Total Fuel Consumption (Fig. S−9); Daily Potable Water Consumption (Fig. S−10); Total Nonpotable Water Consumption (Fig. S−11); Sanitary Waste Generation (Fig. S−12); Generation of New Direct and Indirect Jobs (I.e., would require more labor) (Fig. S−15); Latent Cancer Fatalities Among Workers (Fig. S−16); Nonradiological Transportation Fatalities (Fig. S−19); Increase in Truck Traffic on US-191 (Fig. S−21); and Increase in Moab Traffic from Commuters (Fig. S−22). While both truck and rail would generate more dust than slurry, it is clear that DOE has developed a great deal of experience in its reclamation of 22 UMTRCA sites, and is capable of dealing with all construction and operational phases with a minimum of exposure by workers and the public in general.

Response:

See response to comment #16. As the commentor states, DOE has developed a great deal of experience in reclamation of UMTRCA sites. However, public input provides valuable information that is unique to each site. The commentor's efforts and concerns added valuable perspective to the many factors considered in the EIS.
==

Document #351 Comment #19 Commentor: Binyon, Jean

It is recognized that trucking will be necessary as an adjunct to rail, to move all of the material in the vicinity properties to the Moab site, for example, as well as to move mill parts and other debris which cannot be loaded into railcars. Trucks will also to used between rail sidings and disposal cells. One further point--since some borrow materials may be moved by truck, it is best to use borrow areas which minimize the need for use of US-191.

Response:

The commentor accurately characterizes the need for some truck transport, even under the rail and pipeline transportation options. Several factors would be considered in determining which borrow areas would eventually be used. Should US-191 or other public highways be used, DOE would follow applicable regulations and safety guidelines (for example, those associated with the generation of fugitive dust) to protect the public and environment.
==

Document #351 Comment #20 Commentor: Binyon, Jean

Klondike Flats site has drawbacks

1) Interference with Recreation, especially during construction and operation of the disposal cell:

Klondike Flats is just north of the Canyonlands Field Airport and north of the Blue Hills Road, which has heavy recreational use. Hikers, campers, mountain bikers and off-highway vehicles use the area during most of the year. It is estimated that 53,000 recreational use visits occurred in 2002. The Blue Hills Road is also used to access a track used by motorcycles and ATVs, especially in the spring and fall, an estimated 1,000 user days per year. Construction of a new public access road and overpass and movement of the tailings and other materials would create dust, noise and vibration which would severely affect recreation and airport employees and users.

By contrast, the Crescent Flats site at Crescent Junction has little if any recreational use.

Response:

Comment noted. The information the commentor provides is presented in Section 3.2.9 of the EIS, the land use and transportation impacts of relocating the tailings to the Klondike Flats site are identified in Section 4.2.8. The affected environment at the Crescent Junction site is presented in Section 3.3.10. This section does indicate that recreational use of this area has been observed to be low.

==

Document #351 Comment #21 Commentor: Binyon, Jean

2) Restricts room for growth, for airport expansion, and other future needs:

Klondike Flats is only 18 miles from the fast-growing Moab and Spanish Valley areas. While the site itself is on BLM administered lands, there are properties within the northern corridor which are privately owned or are administered by the State of Utah School & Institutional Trust Lands Administration (SITLA). SITLA is mandated to maximize the value of its holdings to enhance revenues for public education. The corridor could provide for economic assets such as gas stations, motels and campgrounds which serve visitors.

The Crescent Flats site is near only to Crescent Junction, whose only industry--a gas station, appears to be closed. Neither Crescent Junction nor the small settlement of Thompson Springs, 6 miles away, contain significant population centers; neither is expected to grow in the future.

Response:

The Klondike Flats site is located in an area that BLM has determined is suitable for disposal of tailings under its resource management plan, which is consistent with the multiple-use concept under the Federal Land Policy Management Act of 1976. Other features characterized by the comment and the EIS will be considered in DOE’s final decision-making.

==

Document #351 Comment #22 Commentor: Binyon, Jean

3) Proximity to National Parks

Klondike Flats is close to Arches National Park. As shown in figures 4−10 and 4−11, on pages 4−79 and 4−80 of Volume I, the disposal cell would be potentially visible from this much visited park. The increased truck traffic and impacts of construction of overpasses and access roads could decrease visitors' appreciation of the area over the many years required for this project.

While the Crescent Junction disposal cell site would be somewhat more visible, it would be most apparent from the I-70 scenic overlook.

Response:

Section 4.2 identifies the various impacts associated with the Klondike Flats disposal alternative, including the visual resources (Section 4.2.11) and traffic impacts (Section 4.2.8), and Section 4.3 identifies the various impacts associated with the Crescent Junction disposal alternative.
==

Document #351 Comment #23 Commentor: Binyon, Jean

Other comparisons of Klondike Flats and Crescent Junction

In many regards, Table 2−32 Summary and Comparison of Impacts shows few if any differences in impacts between the two sites including: Geology and Soils, Air Quality, Surface Water, Floodplains and Wetlands, Aquatic Ecology, Noise and Vibration, Traffic, and Environmental Justice.

Response:

The commentor's assessment of Table 2−32 for the Klondike Flats and Crescent Junction sites is consistent with the data presented in the table.
==

Document #351 Comment #24 Commentor: Binyon, Jean

In terms of Ground Water, the table shows that "Additional contamination from the ammonia salt layer could reach ground water within 1,100 years and could continue until 1,540 years from the present, even after completion of ground water remediation" if materials are stored on-site. Travel time at Klondike Flats to underlying ground water would be 25,000 years, and at Crescent Junction 170,000 years.

Response:

DOE agrees. These estimates are found in the EIS.
==

Document #351 Comment #25   Commentor: Binyon, Jean

In terms of Terrestrial Ecology and Land Use, differences were projected in the number of acres disturbed for transportation infrastructure and total acres of short-term land disturbance. Whether moved by truck or rail, there would be more such disturbance at Klondike Flats than at Crescent Junction.

Response:

Table 2−32 of the EIS shows that surface disturbances at the two sites would be similar. Surface disturbance does not necessarily result in adverse impacts.
==

Document #351 Comment: #26   Commentor: Binyon, Jean

More Cultural Sites would be adversely affected at Klondike Flats—15 to 32, versus estimates at Crescent Junction where 4 to 11 would be affected.

Response:

The EIS states that 15 to 35 cultural sites could be adversely affected under the Klondike Flats alternative using rail transportation (Section 4.2.9), and 4 to 11 could be adversely affected under the Crescent Junction alternative using rail transportation (Section 4.3.9).
==

Document #351 Comment #27   Commentor: Binyon, Jean

Costs at Crescent Junction would be somewhat higher than at Klondike Flats. On the other hand, benefits in terms of Annual Output of Goods and Services and Annual Labor Earnings would also be higher at Crescent Junction.

Response:

DOE acknowledges the comment.
==

Document #351 Comment #28   Commentor: Binyon, Jean

A further advantage of Crescent Junction is that the site contains more of the borrow materials which would be needed. Thus, the maximum increase in average annual daily truck traffic on US-191 from shipping borrow materials would be 16% for Klondike Flats compared to only 6% for Crescent Junction. The 6% at Crescent Junction is even lower than the 10% which would be incurred with on-site disposal.

Response:

DOE concurs that Crescent Junction has a considerable volume of potential borrow materials. Also, see response to comment #19.
==

Document #351 Comment #29 Commentor: Binyon, Jean

The Summary Tables show no discernable differences between the two sites, if materials are moved by rail, in Annual Withdrawals of Colorado River Water (Fig. S−4); Maximum Land Disturbance (Fig. S−5); Power Requirements (Fig. S−8); Daily Potable Water Consumption (Fig. S−10); Total Nonpotable Water Consumption (Fig. S−11); Sanitary Water Generation (Fig. S−12); Annual Generation of Residual Radioactive Material and Solid Waste (Fig. S−13); Annual Costs and Benefits (Fig. S−14); Latent Cancer Fatalities Among Workers (Fig. S−16); Public Latent Cancer Fatalities (at the Moab Site)(Fig. S−17); Public Latent Cancer Fatalities from Vicinity Property Exposure (Fig. S−18); Increase in Truck Traffic in Downtown Moab (Fig. S−20); and in Borrow Material Requirements (Fig. S−24).

Response:

The commentor's assessment of the summary tables for the Klondike Flats and Crescent Junction sites, if the materials are moved by rail, is consistent with the data presented in the tables.
==

Document #351 Comment #30 Commentor: Binyon, Jean

The Klondike Flats site has more adverse impacts in the following: Maximum Number of Potentially Affected Cultural Resources (Fig. S−6); Generation of New Direct and Indirect Jobs (Fig. S−15); and Increase in Truck Traffic on US-191 (Fig. S−21).

Response:

The commentor's assessment of the summary tables for the Klondike Flats and Crescent Junction sites, if the materials are moved by rail, is consistent with the data presented in the tables.
==

Document #351 Comment #31 Commentor: Binyon, Jean

The Crescent Junction site has more adverse impacts in: Total Fuel Consumption (Fig. S−9); Nonradiological Transportation Fatalities (Fig. S−19); and Increase in Moab Traffic from Commuters (if materials are moved by truck) (Fig. S−21). It should be noted that all of these impacts are due to the fact that it is further than Klondike Flats from the Moab site. Indeed, this very isolation of the Crescent Junction site is a major advantage.

Response:

The commentor's characterization of the differences in total fuel consumption, nonradiological transportation fatalities, and traffic from commuters (if materials were moved by truck) from the EIS is essentially correct. Sections 2.1 and 2.2 of the EIS identify the relative distances to the sites from the Moab site for each alternative. Additional comparisons of all alternatives are found in Tables S−1 and 2−32.
==

Document #351 Comment #32 Commentor: Binyon, Jean

There is one factor that affects Crescent Junction but not the Klondike Flats site, and that is the possible construction and operation of the Williams Petroleum Pipeline Terminal on fenced 50-acres within a 65-acre site adjacent to the Crescent Flats acreage. (See Fig. 2−24, page 2−55 of Volume I.) This aboveground and underground facility would include storage tanks, a truck-loading rack, vapor combustion system, electrical substation, offices and warehouse buildings. It would be served largely by truck traffic. Approved by BLM in 2001, the project has been delayed by litigation. If the Williams timeframe coincides with that of DOE's Remediation of the Moab Uranium Mill Tailings, cumulative impacts will have to be taken into account in developing the remedial action plan. The Williams project would not disqualify the Crescent Junction site.

If the Williams facility is actually built, it will be much more prominent and visible from both I-70 and US-191 than will the finished disposal cell and site.

Response:

DOE would work with BLM and land users, including Williams Petroleum Products, to coordinate activities to minimize disruption of other surface uses and protect environmental considerations.
==

Document #351 Comment #33 Commentor: Binyon, Jean

On page S−11 of the Draft EIS, it states: "DOE intends to consider the results of the <u>analysis</u> provided in this draft EIS, the relative <u>costs</u> among the alternatives, and <u>other factors</u>, such as public and agency comments on this draft EIS (including the views of cooperating agencies), in determining its preferred alternative for the disposal cell location and remediation of vicinity properties". (Emphasis mine) In addition, the National Academy of Sciences made it clear that consideration of long-term impacts should help guide the eventual remediation decision.

We have looked at the same three considerations. While we are unable to gauge the validity of technical requirements and of conceptual and analytical models--such as cost modeling, we applaud the DOE for its widespread release of the Draft EIS and sufficient comment period, for recognizing differences in interpretation by reviewers, and for its efforts to include the public in scoping and informational meetings. However, we find the analysis of costs presented in the Summary document to be incomplete and misleading. Indeed, the consequences of uncertainties/assumptions imply that the risks of on-site disposal of the tailings could result in extremely high costs--in more than federal dollars. In terms of "other factors," we implore you to give priority consideration to the many members of the public and the many agencies and organizations which urge you to MOVE THE TAILINGS.

Response:

DOE feels that the cost estimates generated to support decision-making are sufficient. See response to comment #1.
==

Document #378 Comment #1 Commentor: Women's Chamber of Commerce Community Safety Committee

1. Will moving the uranium tailings pile secure safe drinking water?

Response:

In addition to site-derived contaminants, the ground water beneath the Moab site is naturally saline from the dissolution of salts from the Paradox Formation. As a result, the on-site ground water meets the EPA definition of a limited-use aquifer, and supplemental standards would apply since the aquifer is non-potable. Relocation of the pile would not alter this naturally occurring condition. Conflicting opinions regarding the potential for site-derived contaminants to have migrated under the river are discussed in Section 2.6.4.
==

Document #378 Comment #2 Commentor: Women's Chamber of Commerce Community Safety Committee

2. What is the preferred site to move this waste?

Response:

DOE has identified Crescent Junction as its preferred off-site disposal location.
==

Document #378 Comment #3 Commentor: Women's Chamber of Commerce Community Safety Committee

3. Can this waste be used for other sources if recycled?

Response:

The technical and economic feasibility of reprocessing the wastes is unknown and, even if proven feasible, would require an additional EIS to implement. The uncertainties of this issue make it too highly speculative to include in this EIS.
==

Document #378 Comment #4 Commentor: Women's Chamber of Commerce Community Safety Committee

4. What is the cost of this move if Las Vegas is selected as the location for pilings?

Response:

DOE assumes that the commentor is referring to the planned Yucca Mountain High Level Waste Repository north of Las Vegas. That facility is not an option for this type of radioactive waste.
==

Document #378 Comment #5 Commentor: Women's Chamber of Commerce Community Safety Committee

5. Are other waterways endangered by similar situations?

Response:

There are no other UMTRCA sites comparable to Moab.
===

Document #378 Comment #6 Commentor: Women's Chamber of Commerce Community Safety Committee

6. What has been done to prohibit coal waste dumping in American water ways?

Response:

Coal wastes are beyond the scope of this EIS.
===

Document #378 Comment #7 Commentor: Women's Chamber of Commerce Community Safety Committee

7. How does a family protect themselves from cancerous waters?

Response:

Protection from any carcinogen is best achieved through avoidance or minimization of exposure.
===

Document #378 Comment #8 Commentor: Women's Chamber of Commerce Community Safety Committee

8. Does boiling rid the water of all dangerous agents in water?

Response:

Boiling cannot eliminate all dangerous agents from water.
===

Document #378 Comment #9 Commentor: Women's Chamber of Commerce Community Safety Committee

9. Is there a way to disolve this waste without endangering the air quality?

Response:

Assuming the commentor is suggesting that the hazards posed by the Moab mill tailings be eliminated by dissolving them, there is no such solution.
===

Document #378 Comment #10 Commentor: Women's Chamber of Commerce Community Safety Committee

10. Will the costs of this relocation be paid by the EPA?

Response:

The costs of remediation will be borne by taxpayers through appropriations to DOE's annual budgets.

==

Document #427 Comment #1 Commentor: Stafford, Richard A.

I am opposed to On-Site Disposal, utilization of the White Mesa Mill Site and a No-Action alternative. The tailings pile must be moved. Everyone aware of the pile's existence has known this for many years as evidenced by the DOE's thorough analysis and documentation as presented in your Draft EIS. The tailings are much, much too close to the Colorado River. Consequently, they pose an unacceptable long term risk to the downstream environment and users of the river's resources in terms of on-going leaking and leaching of contaminants and in terms of the chances for a shift in the river channel, either slowly over time or suddenly, with catastrophic consequences.

Response:

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.

In Section 4.1.3.1, the EIS acknowledges the potential for flooding of the tailings pile if the on-site disposal alternative were selected and quantifies the impacts that could result from such inundation. These impacts would include additional leaching of contaminants into the ground water and subsequent migration to the river. If on-site disposal were selected, the disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. Section 4.1.17 in the EIS addresses impacts from a catastrophic cell failure due to natural phenomena. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if on-site disposal were selected.

==

Document #427 Comment #2 Commentor: Stafford, Richard A.

Finally, and not an insignificant consideration, is the long-term health effects on the residents of Moab and the Grand Valley from wind-blown dust and particles from the pile, despite the best efforts to prevent this with proper cap maintenance.

Response:

DOE is actively working to control dust prior to final decision-making and is monitoring air and dust emissions from the site. Although visible dust is an occasional problem, monitoring data published quarterly on the project web site (http://gj.em.doe.gov/moab) demonstrate that protective standards are not being exceeded at any current off-site receptors. The health impacts from both radiological and nonradiological contaminant exposures of workers and the public are analyzed under the on-site disposal alternative (Section 4.1.15) and under the No Action alternative (Section 4.6.15).

==

Document #427 Comment #3 Commentor: Stafford, Richard A.

I am opposed to the White Mesa Mill Site Alternative primarily because of the long distance transport of tailings this requires. First the considerable distance involved as compared to the two other off-site disposal alternatives immediately makes White Mesa relatively less favorable. Secondly, the terrain between the pile's present location and White Mesa is not conducive to transport of such a hazardous material. Whether by highway or slurry pipeline, this rugged country of sharp hills, canyons, and rock monoliths makes this alternative a choice of "last resort" from a transport consideration. As a civil engineer, I can envision the detailed engineering required to construct and safely operate a slurry pipeline through this area. It can be done but at a great cost in route surveying, engineering design, right of way acquisition and construction and maintenance. Operational costs of transport and the costs associated with recycling the water and returning it to Grand County are further factors against this alternative. There are a number of points to consider with regards to use of the existing highway for truck transport, all reasons for not choosing this alternative. The present highway is well designed and accommodating of the topographic hurdles it must overcome. Nonetheless, the chances of an accident and spillage or loss of tailings material is greater on this highway than it would be on a highway having a more uniform grade and a more linear alignment.

Response:

Residual radioactive material that would be transported does not present an acute or immediate hazardous health risk. Rather, residual radioactive material presents a long-term risk based on the duration of exposure. Therefore, transportation risks associated with residual radioactive material would be negligible. The greater risk potential is associated with traffic accidents, as indicated by the commentor. The commentor also raises valid concerns regarding the cost of surveying, design, and other activities for a slurry pipeline. DOE will consider these factors, among others, in its final decision-making.

==

Document #427 Comment #4 Commentor: Stafford, Richard A.

I am a frequent user of this highway both on business and for access to recreation areas. I have an engineering office in Cortez, Colorado, a branch office in Monticello, Utah and business dealings in Moab and Blanding. I have traveled this highway between Blanding and Moab in all weather and all times of the day. The highway is heavily used by trucks, recreation vehicles and passenger cars. It would not be wise to increase this traffic loading with the transport of the mill tailings to White Mesa. I am sure you are well aware of the traffic through the city of Moab with predictions approaching 1000 trucks per day without the addition of tailings transport. There is no reasonable bypass route around downtown Moab. Likewise, for Monticello and Blanding, these two cities should not suffer the consequences of tailing truck traffic. And although it is conceivable that bypasses could be built around each city, the associated costs, both in construction and in lost revenue for city businesses from tourists and others not going through the downtown commercial area eliminates this from consideration. In summary, given that there are other, more viable alternatives, there is no justification for hauling the tailings by truck to White Mesa.

Response:

The commentor raises several valid concerns. See response to comment #3.
==

Document #427 Comment #5 Commentor: Stafford, Richard A.

Finally, with regards to the White Mesa alternate, it is not proper to burden the residents of this area with the potential hazards associated with relocating the tailings pile there.

Response:

DOE acknowledges the comment. The impacts of the White Mesa Mill alternative are identified in Section 4.4 of the EIS, including the socioeconomic, human health, land use, and environmental justice impacts.
==

Document #427 Comment #6 Commentor: Stafford, Richard A.

I am I favor of either of the two Grand County alternatives, either disposal at Klondike Flats or at Crescent Junction. The big advantage of both of these two alternatives is their close proximity and relative ease of access by-means-of rail transport. I understand one of the objections to the Klondike Flats Alternate is its heavy use by bikers. Loss of a recreational feature that can be replicated elsewhere in Utah is an invalid reason for not considering this site when other factors such as geology, topography and hydrology are of much more importance.

Response:

The commentor's preference for relocating the tailings pile by rail to the Klondike Flats site or Crescent Junction site is noted. DOE concurs that loss of a recreational feature that can be replicated elsewhere in Utah is an invalid reason for not considering a site. Consequently, the Klondike Flats site has been retained for consideration as a reasonable alternative throughout the development of this EIS.
==

Document #427 Comment #7 Commentor: Stafford, Richard A.

I also encourage you to institute an active and comprehensive groundwater remediation system at the site of the tailings pile employing the latest “pump and treat” technology.

Response:

DOE has already undertaken ground water interim actions at the Moab site to reduce contaminant migration. These actions include capturing and evaporating some of the most contaminated ground water from the legacy plume that is entering the Colorado River and reducing the contaminant seepage from the pile area that has potential to migrate into the ground water beneath the pile. These interim actions have proven to be very effective in significantly reducing the total mass of contaminants reaching the river.
==

Document #427 Comment #8 Commentor: Stafford, Richard A.

In summary, Klondike Flats Alternate and Crescent Junction are the two most favorable alternatives. The White Mesa Mill Site is the least favorable due to all the transportation factors associated with it.

Thank you and your staff for all of your efforts and for this opportunity to comment on the draft EIS.

Response:

DOE will consider this opinion in its final decision-making.
==

Document #429 Comment #1 Commentor: Dohrenwend, John C.

Dr. John Dohrenwend's 15-page report, titled "Review of the Department of Energy's Assessment of Potential Flood Hazards at the Moab Project Site (Atlas Tailings Pile)," is reproduced in its entirety in Chapter 3.0, Document #429.

Response:

The commentor provides an extensive critique of DOE's position on river migration and presents several alternate interpretations of the existing data. These interpretations often differ markedly from DOE's interpretation and position on this topic. Section 2.6.4 has been developed to present responsible opposing views. That section addresses the commentor's issues in more detail.
==

Document #433 Comment #1 Commentor: Kain, Nancy

Our shameful policy decision to ignore the Kyoto accord should not be followed by another enviornmental abuse. Please reconsider.

Response:

Thank you for your comment.
==

Document #444 Comment #1 Commentor: Owens, Stephen A.—Arizona Department of Environmental Quality

Preferred Alternative

The DEIS states that DOE has not identified a preferred alternative at this time. The State of Arizona strongly supports the complete removal of the tailings and contaminated materials from the site and believes either the Klondike Flats or the Crescent Junction locations are superior to the White Mesa Mill site due to transportation, disposal, and environmental justice issues.

Response:

Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4.

==

Document #444 Comment #2 Commentor: Owens, Stephen A.

Alternatives

The DEIS outlines two major alternatives:

- On-site disposal, which would involve stabilization and capping of the existing pile and would take 7−10 years to complete at a cost of $166 million.

- Off-site disposal would take upwards of 8 years with costs ranging from $329 to $464 million, depending on the choice of final disposal location and transportation option. DOE has identified three locations in Utah as potential off-site disposal locations:

  - Klondike Flats, about 18 miles northwest of the site;

  - Crescent Junction, approximately 30 miles northwest of the site; and

  - White Mesa Mill, approximately 85 miles south of Moab and within 6 miles of the Ute Mountain Reservation and the communities of White Mesa and Blanding, UT.

While the costs for off-site removal are 2−3 times higher, the actual timeframe for completion of the tailings removal action is shorter.

Response:

The commentor's characterization of the costs and time frames for the various alternatives is essentially correct.

==

Document #444 Comment #3 Commentor: Owens, Stephen A.

ADEQ strongly encourages the DOE to consider off-site disposal as the preferred alternative for the following reasons. The proximity of the pile to the Colorado River and the potential for the river to migrate are key reasons to consider complete removal. Secondly, the need for stabilization of the site and the fact that on-site stabilization will not eliminate the continual source of contamination to groundwater, makes off-site disposal clearly the more comprehensive and environmentally protective alternative, in the long-term.

Response:

See response to comment #1.

The Department has considered all alternatives addressed within the EIS, including the off-site disposal alternatives. To support informed decision-making, the EIS describes the physical setting of the on-site disposal alternative (Section 3.1), discusses the potential for river migration (Section 4.1.17 and Section 2.6) and the uncertainties regarding this issue (Section 2.6), and assesses the impacts associated with the highly unlikely event of a catastrophic failure of an on-site disposal cell (Section 4.1.17). The EIS acknowledges that there will be perpetual mass loading of contaminants to the ground water and surface water system should the pile be capped in place (Sections 4.1.3 and 4.1.4). However, the EIS identifies the impacts from this loading to be currently protective of human health and will be below protective levels for ecological receptors after approximately 80 years of ground water remedial action. The EIS also acknowledges that there is the potential for long-term impacts beyond the regulatory period of 200 to 1,000 years (Section 2.6).

==

Document #444 Comment #4 Commentor: Owens, Stephen A.

Of the three sites analyzed, both the Klondike Flats and Crescent Junction sites are preferable to the White Mesa Mill location. While both Klondike Flats and Crescent Junction will require construction of new disposal cells, both sites are in remote, sparsely populated areas with large tracts of state and federal land. Both are accessible by rail which would expedite the removal versus transport by truck. The environmental impacts to both sites will be similar.

Response:

See response to comment #1.
==

Document #444 Comment #5 Commentor: Owens, Stephen A.

The White Mesa Mill site is an existing disposal site but it is also the farthest from the Moab location. Rail access is not available so transportation options focused on truck transport or slurry pipeline. Use of the White Mesa Mill site would result in unique cultural and environmental justice impacts given its proximity to the Ute Mountain Reservation and the communities of White Mesa and Blanding. In addition, there are rich cultural resources that would be disturbed preparing the site for additional storage and the pipeline corridor.

Response:

The comment accurately summarizes elements of the affected environment and impacts relevant to the White Mesa Mill alternative that are included in the EIS.
==

Document #444 Comment #6 Commentor: Owens, Stephen A.

Lastly, DOE estimates the site contains 11.9 million tons or 8.9 million cubic yards of material. There is limited discussion in the DEIS as to how these values were obtained other than references to field characterization studies, DOE's experience with similar sites and historical data. While DOE acknowledges there could be a significant difference between the calculated and actual tailings volume, there is no discussion regarding the impact of quantity discrepancies on the remediation efforts. The pile characteristic uncertainties may not impact the final engineering design but could dramatically affect final surface remediation costs and scheduling. For example, if the DOE has dramatically underestimated the volume of the pile or contaminated soils, the amount and hauling time of cover material for on-site disposal will be affected. If off-site disposal is selected as the preferred option, these uncertainties could have considerable impacts on the transportation options.

Response:

Uncertainties regarding the total amount of contaminated material and recognition of the effect on costs and transportation are specifically acknowledged in Table 2−33, item #4.
==

Document #444 Comment #7 Commentor: Owens, Stephen A.

Transportation

For off-site disposal, three transportation modes were evaluated: truck, rail and slurry pipeline. Truck transport would use existing US-191 as the primary transportation route for hauling contaminated materials off-site and hauling borrow materials to the selected disposal site. An existing rail line runs from the Moab site north along US-191 and connects near I-70. Rail access exists to both Klondike Flats and Crescent Junction but would require some upgrades and additional rail sidings. Rail access is not available to White Mesa Mill and the option was not analyzed for that site due to technical difficulties, potential impacts and high costs. Lastly, the DEIS looked a slurry pipeline delivery to each of the potential disposal sites.

Given the usual highway tonnage limitations for truck transport, ADEQ questions DOE's time estimates for moving the material by truck, particularly in light of the uncertainties in the actual volumes. At a minimum, truck transport would noticeably increase truck traffic on US191 for upwards of 8 years. If White Mesa Mill is selected, the truck traffic will travel through central Moab, already congested with local and tourist traffic. The rail option, after the relatively minor grade improvements and additional sidings, could move vast quantities of material with little or no impact on US-191 and would seem to be the fastest and most efficient option. Given the types of pollutants being handled, the slurry pipeline does not appear to be a good option and at the very least, DOE should require additional investigation into potential environmental impacts in the event of inevitable pipeline leaks or failures.

Response:

DOE's time estimates for moving the pile by truck are based on the Department's considerable experience with relocating many other uranium mill tailings piles under UMTRCA. However, the EIS acknowledges several areas of uncertainty that could increase the length of time for pile removal. Because the estimated volume of a hypothetical slurry pipeline leak that would occur before system shutdown is small (see the *Safety* discussion in Section 2.2.4.3), DOE does not believe a more detailed study of potential impacts is warranted.

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Document #444 Comment #8 Commentor: Owens, Stephen A.

Groundwater Remediation

Groundwater remediation will be conducted under both the on-site and off-site disposal alternatives. As presented in the DEIS, the proposed system will cost approximately $11 million to design and construct, with an annual operating budget of over $900,000. Construction will take approximately 5 years and the system will be in operation for 75−80 years.

The DEIS indicates that DOE proposes to implement an active remediation system to intercept and control discharge of contaminated groundwater to the Colorado River. Because there are no alternatives discussed regarding groundwater remediation, there are few details of the actual remediation plan. The DEIS indicates that ammonia is the major contaminant of concern, however, “roll front” uranium deposits typically contain a variety of mineral species. Other potential contaminants include uranium; its daughter products radon and radium; molybdenum; copper; selenium; vanadium; and arsenic. However, there is no discussion of impact of other contaminants discharging to the Colorado River. There is mention of the contamination plume but no details regarding size, movement, or levels.

Based solely on the overview in the DEIS, ADEQ has the following comments regarding the proposed groundwater remediation strategy:

» It is not clear why it will take up to five years to intercept and contain the plume, given the low recharge rate estimates. The DEIS states that the pump and treat system will operate for 75−80 years but elsewhere it states the “groundwater under the Moab site would return to background levels after 150 years.” Does this mean that following the 75−80 years of pump and treat, an additional 70−80 years of natural attenuation is needed to restore groundwater to natural background?

» If the preferred alternative is off-site disposal, removal of the tailings will involve the stripping off of layers that will expose the underlying material to leaching. How will DOE, during the active removal, limit the exposed material to leaching of additional contaminants?

Response:

As stated in the EIS (Section 2.3.1), DOE presumes that these other contaminants would reach protective levels within the same time frame that it would take for ammonia to reach protective levels because their concentrations are less elevated above applicable cleanup criteria (e.g., surface water standards), the constituents are less widespread, or they occur at elevated concentrations less frequently. However, DOE acknowledges in the EIS that there is uncertainty in this assumption due to factors such as differences in solute transport and sorption mechanics. The commentor is referred to the SOWP for more details regarding other contaminants discharging to the Colorado River. Section 2.3.1.2 of the EIS has been expanded to further explain DOE’s rationale for using ammonia as its key contaminant, and Appendix A2 provides an evaluation of all possible contaminants. The 5-year period is not only to intercept and contain the plume but also to reduce concentrations of contaminants to levels that are protective of aquatic species in the surface water. As stated in the EIS (Section 2.3.2.2), it may be possible that considerably less time could be required to reach protective levels.

Document #444 Comment #8 - response continued

Results of DOE's contaminant transport and ground water flow computer modeling indicate that it would take approximately 75 years for the ground water to passively clean itself to levels that would be protective in the adjacent surface waters if the pile were relocated. If the pile were stabilized in place, it would take 5 years longer, or approximately 80 years, to reach the same level of protection. After protective levels in the surface water were reached, the active remediation could be discontinued, and an additional 120 years would be required for the system to reach steady-state (background would not be reached) under the on-site alternative and an additional 75 years for the system to reach background levels under the off-site alternative.

The rate of leaching through the tailings is slower than the rate by which DOE would excavate and remove the tailings. The actual method of drying the tailings would be developed as part of the engineering design after the Record of Decision and would include controls to prevent contamination of the soils and ground water. Conventional engineering solutions, including a liner for the drying bed or a mechanical system such as a press or centrifuge, would be considered.

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Document #444 Comment #9 Commentor: Owens, Stephen A.

Surface Water Quality

Because of the vital role of the Colorado River to the lives of millions in both the Upper and Lower Basin States, ADEQ strongly supports the state of Utah's request that the chronic surface water quality standards be used to ensure protection of aquatic species. This is particularly true in the case of ammonia which is one of the most prevalent contaminants in the groundwater and is the constituent of greatest ecological concern that is discharging into the Colorado River and adjacent backwaters. The groundwater contamination has been ongoing for decades and has been leaching into the river for decades as well. This has created a chronic water quality condition that acute water quality standards are not designed to protect against. The final Environmental Impact Statement should also Utah's surface water quality standards in addition to the federal Safe Drinking Water Act standards to ensure proper protection of human health, aquatic life and wildlife. The DEIS clearly states the aquifer is already compromised for drinking water purposes. Arizona is primarily concerned with attaining and maintaining a water quality that is protective of aquatic life and wildlife.

DOE's primary justification for using the less protective "acute" standard appears to be that use of the "chronic" standard would lengthen the duration of the groundwater remediation strategy. The DOE estimates is will take up to 80 years to reach the remediation target of 3 mg/L for ammonia but believes the remediation system will result in surface water quality that is protective of aquatic species within 5 years after the system begins treatment. It is unclear how these two statements can be true given that aquatic life can tolerate 3 mg/L as ammonia under a very narrow range of physical conditions.

Response:

Results of DOE's contaminant transport and ground water flow computer modeling indicate that it would take approximately 75 years for the ground water to passively clean itself to levels that would be protective in the adjacent surface waters if the pile were relocated. If the pile were

Document #444 Comment #9 - response continued

stabilized in place, it would take 5 years longer, or approximately 80 years, to reach the same level of protection. In the meantime, the Department would perform ground water remedial actions to maintain protective levels in the river until the 75- to 80-year period was reached.

DOE's primary justification for use of the acute ammonia-nitrogen standard (3.0 mg/L) is based on risk (protection) rather than duration. Acute and chronic ammonia criteria in surface water are based on the national ambient water quality criteria (AWQC). The acute criteria are a function of water pH, and the chronic criteria are a function of water temperature and pH. The federal criteria documentation does not recommend using an average temperature and pH to calculate a single applicable value for the standards, but rather a range of standards that may apply under observed pH and temperature conditions. Chronic aquatic criteria represent the low end of the potential concentration range for protection of aquatic species from ammonia toxicity. The majority of chronic values measured in the surface water at the site range from 0.6 to 1.2 mg/L ammonia (total as N) based on sitespecific pH conditions. Acute criteria represent the higher end of the concentration range; the majority of acute values measured in the surface water range from 3 to 6 mg/L based on site-specific temperature and pH conditions. Therefore, it is DOE's position that ammonia concentrations (total as N) in surface water in the 0.6- to 6-mg/L range would be fully protective of aquatic life.

If ammonia concentrations in the ground water met the surface water standards, then discharge of ground water to the surface should not result in exceedances of those standards unless some other process (e.g., evaporation) increased contaminant concentrations in surface water. However, establishing the low end of the protective range as the ground water cleanup goal is probably not necessary to achieve compliance with surface water standards. Data available in the SOWP regarding interaction of ground water and surface water indicate that concentrations of most constituents decrease significantly as ground water discharges to and mixes with surface water (a 10-fold decrease is observed on average [DOE 2003a]). A more recent calculation set completed after preparation of the SOWP and the draft EIS supports the position that a 10-fold dilution factor does apply in most instances where the ground water plume is discharging to the main branch of the river adjacent to the site. In background locations where elevated ammonia from the Paradox Formation is discharging to the surface water, the 10-fold dilution factor may not apply. This more recent calculation set (DOE 2005a) also provides a more detailed evaluation of the transfer mechanism between ground water and backwater areas. Consequently, there is a reasonable assurance that protective surface water concentrations could be achieved by meeting less conservative goals than chronic standards in ground water. For this reason, the Department proposes to use the 3-mg/L concentration of ammonia as a target goal for evaluating ground water cleanup options. However, the ultimate remediation objective would still be to meet all applicable ammonia standards, both acute and chronic, in surface waters to be protective of backwater habitat.

Further, in its Biological Opinion (Appendix A3 of the EIS), the USF&WS presents a different opinion regarding the UDEQ arguments on the applicability of the chronic surface water standards and agrees that DOE's establishment of a ground water compliance goal of 3 mg/L would meet both acute and chronic surface water standards and be protective of aquatic organisms.

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Document #444 Comment #10 Commentor: Owens, Stephen A.

The State of Arizona appreciates the opportunity to review and comment on this important project. As you know, Arizona counts on the Colorado River for fishing, recreation and providing drinking water to millions of its citizens. It is ADEQ's responsibility to the people of Arizona to ensure that water quality problems are identified and addressed appropriately, especially in a state like ours where water is such a precious and limited resource.

Response:

DOE appreciates the participation of the State of Arizona in this important decision-making process and will consider the state's comments in its final decision-making.
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Document #445 Comment #1 Commentor: Stapleton, Maureen—San Diego County Water Authority

The San Diego County Water Authority (Water Authority) is a regional public agency responsible for providing wholesale supplemental water supplies to the more than 3 million residents of San Diego County, California. Last year, Colorado River water comprised approximately 66 percent of the total supply served to these people. Historically, San Diego County has relied upon Colorado River water supplies for 50 to 100 percent of its total water supply. Consequently, activities that affect Colorado River water quality are of vital interest.

Response:

DOE acknowledges the Water Authority's reliance on Colorado River water and will take its views into consideration in its final decision-making.
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Document #445 Comment #2 Commentor: Stapleton, Maureen

The Water Authority has reviewed the draft Environmental Impact Statement (EIS) for Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah. The EIS describes various alternatives for remediating contamination resulting from the uranium mill tailings located immediately adjacent to the Colorado River. The current location of this approximately 12 million-ton waste pile results in the continued discharge of contaminants to surface and ground waters directly connected to the Colorado River, a prime source of drinking and irrigation water for tens of millions of people in the downstream states of Arizona, Nevada, and California, as well as the Republic of Mexico.

Response:

See response to comment #1.
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Document #445 Comment #3 Commentor: Stapleton, Maureen

This demonstrated source of water supply contamination has been of concern to the Water Authority for a number of years. Because of continued heavy reliance on Colorado River water, the Water Authority is opposed to any remediation alternative that would leave the tailings pile in its present location.

Response:

DOE acknowledges the Water Authority's preference that the tailings pile be moved. Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4.
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Document #445 Comment #4 Commentor: Stapleton, Maureen

In addition, site remediation must include increased water quality monitoring and active measures to cleanse groundwater of contaminants to meet applicable water quality standards.

Response:

DOE is proposing to remediate ground water under EPA regulations in 40 CFR 192. Protective levels and monitoring methods to demonstrate compliance with surface water standards would be conducted in accordance with the USF&WS Biological Opinion (Appendix A3 of the EIS) and the Record of Decision.
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Document #445 Comment #5 Commentor: Stapleton, Maureen

Relocation of the tailings pile and groundwater restoration would help to protect the valuable water resources of the Colorado River for future generations. This water supply and the health of millions of people are too important to leave to chance. Moving the pile would lessen these risks significantly. Please retain the Water Authority on your mailing list to receive future notifications regarding this project. Thank you.

Response:

See response to comment #3.
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Document #446 Comment #1 Commentor: Nelson, Charles

As a resident of Grand County, Utah, I am concerned how the Atlas Tailings will be removed because of the dust from the tailings in the air when the pile is disturbed. There is concern that it is said to be toxic to the health of people and wildlife, therefore the situation needs to be taken in advisement by knowledgeable people.

P.S. Please consider this newspaper article opinion from the Salt Lake Tribune - 1/30/05

Response:

Possible air quality impacts and human health impacts of transportation under the off-site disposal alternatives are addressed in Chapter 4.0 and Appendix H of the EIS. Transportation of contaminated materials from the Moab site to one of the three off-site locations would result in the exposure of workers and the public to very small amounts of radiation. These exposures would not be expected to result in any latent cancer fatalities to any population.
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Document #488 Comment #1 Commentor: Sakrison, Dave—City of Moab, Mayor

I Removing Dangerous Materials from the Flood Plains of the Colorado River.

“Storage of highly volatile, toxic or reactive materials” in an area that has “even a slight chance of flooding” is prohibited. This is Department of Energy’s (DOE) interpretation of the federal code at 10 CFR 1002.4 (Compliance with Floodplain/Wetlands Environmental Review). This regulation was implemented to protect people and environments from the harmful effects of imprudent actions within designated floodplains and wetlands. The Atlas Tailings Pile contains “highly volatile, toxic and reactive material” and is located in a recognized floodplain.

Response:

DOE believes the commentor intended to cite 10 CFR 1022 (Compliance with Floodplain and Wetlands Environmental Review Requirements), because 10 CFR 1002 deals with the Official Seal of the Department of Energy.

10 CFR 1022.4 provides the following definition of critical action: “critical action means any DOE action for which even a slight chance of flooding would be too great.” Language in 10 CFR 1022.4 (c) indicates that critical actions may include, but are not limited to, “the storage of highly volatile, toxic, or water reactive material.” However, these regulations do not prohibit a critical action in a floodplain. Moreover, residual radioactive material regulated under UMTRCA would not likely meet the definition of highly volatile, toxic, or water reactive.

10 CFR 1022 requires that: “DOE shall exercise leadership and take action to: (a) Incorporate floodplain management goals and wetland protection considerations into its planning, regulatory, and decision-making processes, and shall to the extent practicable: (1) Reduce the risk of flood loss; (2) Minimize the impact of floods on human safety, health, and welfare; (3) Restore and preserve natural and beneficial values served by floodplains; (4) Require the construction of DOE structures and facilities to be, at a minimum, in accordance with FEMA [Federal Emergency Management Agency] National Flood Insurance Program building standards; (5) Promote public awareness of flood hazards by providing conspicuous delineations of past and probable flood heights on DOE property that has suffered flood damage or is in an identified floodplain and that is used by the general public; (6) Inform parties during transactions guaranteed, approved, regulated, or insured by DOE of the hazards associated with locating facilities and structures in a floodplain; (7) Minimize the destruction, loss, or degradation of wetlands; and (8) Preserve and enhance the natural and beneficial values of wetlands.”
DOE has complied with these regulations in the preparation of the EIS by including a Floodplain/Wetlands Assessment and Statement of Findings in Appendix F.
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Document #488 Comment #2 Commentor: Sakrison, Dave

The current Environmental Impact Statement, as written, denigrates the possibility of polluting the Colorado River should the tailings pile be kept in place. DOE’s experience with other similarly located tailings piles in the area, at Monticello and Green River, should be followed. The failure to contain these two smaller tailings piles on porous substructures without protective sub-layers required DOE’s to eventually move both piles after having first attempted to contain them on site. These previous failures challenge DOE’s assertion that the integrity of the Colorado River can be protected by leaving the Atlas Tailings Pile in place.

Response:

DOE’s experience with other uranium mill tailings piles would be followed. DOE has successfully remediated 22 mill sites under Title I of UMTRCA. Three of the 22 sites (two at Rifle, Colorado, and one at Grand Junction, Colorado) were located adjacent to the Colorado River, and the tailings were removed from the floodplain. Of the other 19 Title I sites remediated by DOE, 10 were stabilized in place and 9 were relocated. For example, the disposal site at Green River, Utah, located adjacent to the Green River (a major tributary to the Colorado River), was stabilized on the site.
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Document #488 Comment #3 Commentor: Sakrison, Dave

Federal regulations also require DOE to consider the possibility and consequences of long-term or catastrophic flooding of the Atlas Tailings Pile. Long-term flooding might arise from river migration or subsidence. DOE argues that the first, river migration, has tended south to southeast because of the rapid dissolution and collapse of the Paradox Formation in that direction. Independent geologists and the Utah State Geological Service challenge this assertion by correctly orientating the historical flood maps to show that the Colorado River has migrated north, northwest and southeast away from Moab and towards the tailings pile. This is the very pattern one would expect from the current meandering pattern of the river. It is the north tending arch of the river, propelled by heavy sediment loads, that creates a long-term threat to the integrity of the north bank on which the tailings pile is located. Geological records reasonably describe a river that moves sinuously and forcefully, back and forth between the portals, inherently threatening the integrity of the tailings pile. Legacy Management, the bureaucracy created by DOE to monitor and solve for the next 1000 years, perceived threats to the integrity of the tailings pile, can not be reasonably argued given the length of time and inconsistency of federal bureaucracies and budgets. DOE’s commitment to protecting the tailings pile in a flood plain has little if any historical substance. Even if such a commitment were imaginable, one thousand years is but a fraction of the time needed to mitigate the site’s long-term pollution potential.

Response:

The EIS acknowledges the potential for flooding of the tailings pile if it were capped in place and quantifies the impacts that could result from such inundation (Section 4.1.3.1). These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in the EIS (Sections 2.1.1.1. and 2.1.1.3), an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would reduce even further the already low probability of catastrophic failure of an on-site disposal cell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if DOE decided to implement the on-site disposal alternative.

DOE’s analyses have determined that river migration is unlikely during the regulatory time frame of 200 to 1,000 years; however, the Department agrees that it is likely in the long term. The impacts from a catastrophic failure of an on-site disposal cell are discussed in Section 4.1.17. Differing opinions on river migration are discussed further in Section 2.6.4, and the consequences of this uncertainty are discussed in Tables S−1 and 2−33.

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Document #488 Comment #4 Commentor: Sakrison, Dave

What is the possibility that a catastrophic flood might occur during the “legal” lifetime of the radioactive danger? The “probability” of such catastrophic flood limits “the storage of highly volatile, toxic or water reactive materials” in a floodplain. A 100 year flood of 99,500 cu ft covers the flood plain up to 2’ on the tailing pile and has a 1% chance of occurrence. A 500 year flood of 123,500 cu ft could reach 27’ up onto the pile. The maximum flood considered by DOE was a 10 hour, 150,000 cu ft flow which is ½ of the Probable Maximum Flood (PMF) considered by the Nuclear Regulatory Commission for the Moab site (1999 EIS). With half the volume and force of a PMF, 20 to 80 percent of the tailings pile could wash into the river. The fact that a 100 or 500 year flood event has not occurred historically does not eliminate the probability of such an event. A scenario can be constructed where significant precipitation events in the 21,100 sq miles of up-stream Colorado drainage could cause the collapse of one or both of the up-stream dams. Repeated “precipitation events” could have catastrophic impacts on the tailing pile, protected or not. It has become politically inappropriate to infer the effects that global warming might have on localized weather events. However, the Glen Canyon Dam was almost breached by the floods of the early 80’s. The storms of 2005 have shown their “locally” destructive nature across the Southwest.

Response:

DOE’s assessment has determined that a near-term catastrophic failure would be a highly unlikely event; however, a probability has not been calculated. Also see response to comment #3. In addition, the assumed PMF would likely exceed the energies of water released from a dam failure.
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Document #488 Comment #5 Commentor: Sakrison, Dave

Using historical flood data may in the uncertain future become outdated, even dangerous if probability for catastrophic floods is thereby limited. The “Probable Maximum Flood” while having a statistically low possibility could happen even within the 1000 years of legally required protection window. The USGS study indicates that there may have been at least two floods in the last 800 years that could have washed the entire tailings pile into the river. Similar subsurface gravel bed elevations and the indication of past river channels under the tailings pile substantiate the definition of “probability”. Given these arguments of at the least, “the slight possibility” of structural failure, DOE is mandated by the 10 CFR 1033.4, to prohibit (DOE’s own words) the continued storage of “highly volatile, toxic or radioactive materials” on the floodplain of the Colorado River. To take any other action is irresponsible and dangerous.

Response:

DOE believes that it is appropriate to use historical data to describe the frequency of past catastrophic floods and, from such data, describe the likelihood of future catastrophic events. The EIS assumes that a catastrophic flood would occur no more than once in 500 years. Therefore, DOE agrees that the PMF, while having a statistically low probability, could happen once or twice within the next 1,000 years. DOE disagrees that the two floods cited in the comment “could have washed the entire pile into the river” and also disagrees with the implication that the on-site disposal alternative could bear a similar liability. The responses to comments #3 and #4 provide additional information regarding river migration, flooding, and catastrophic flooding.

Section 4.1.17 and Section 2.6 of the EIS discuss the potential for the Colorado River to migrate and damage the tailings pile if it were not relocated. There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss the opposing views on river migration (Section 2.6.4), which includes discussions of channeling and gravel transport. If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the already highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. The descriptions of the conceptual cell cover and barrier wall design have been expanded in Sections 2.1.1.3 and 2.1.1.4 to state that riprap materials would be sized to withstand the maximum river forces recently identified by USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment. The final design specifications for the wall (including, for example, its dimensions) would be developed in the remedial action plan if the on-site disposal alternative were selected. The estimated cost range for remediation shown in Table 2−33, item #9, would accommodate materials consistent with the recent USGS report.

Regarding the comment citation of 10 CFR 1033.4, please see the response to comment #1 regarding DOE’s compliance with floodplain and wetland environmental review requirements.
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Document #488 Comment #6 Commentor: Sakrison, Dave

2 Socioeconomic Factors of Capping the Atlas Tailings Pile in Place.

This EIS focuses solely on the economic benefits derived from revenues generated by the preparation of storage sites and/or the transportation modes used to move the tailings. The economic benefits of the various alternatives are economically significant and would temporarily improve the economy of Moab. However, what are blatantly lacking in the EIS are the negative socioeconomic consequences of capping the tailings pile on the banks of the Colorado River. Previous paragraphs outlined the probability of long-term or a catastrophic flood would have on the integrity of the tailings pile. That such events would have significant impact on Moab's future recreational viability is a given. It is also important to point out that the enshrinement of a radioactive monstrosity at the entrance to Moab would of itself remind residents and visitors alike that it only a matter of time before the pile could be swept into the river. All those who travel 191 would be impressed with the vision of a 130 acre, 97 ft tall geometrical monolith dedicated to the storage of radioactive waste. It would be an inappropriate historical marker for the thousands of miners who have suffered and continue to suffer the effects of radioactive poisoning. Not only would the tailings pile violate Bureau of Land Management river corridor visual guidelines, it would intimidate future recreational users of the Colorado River. The future economy of Moab, dependent on tourism and recreation, would thereby suffer the long-term consequences of an enshrined radioactive catastrophe waiting to happen. Leaving the pile as a constant reminder, is a slap in the face of a community who willing did the "dirty" work of supplying necessary uranium to a Nation threatened by nuclear war. The appropriate response by DOE is to act now to remove the Atlas Tailings Pile.

Response:

DOE is confident in the quality of the data used in EIS, the integrity of the analyses performed, and the adequacy of the EIS to support its decision-making. The on-site disposal alternative would include a riprap wall that would mitigate against river encroachment, thus mitigating potential negative socioeconomic impacts of disposal cell failure during the next 200 to 1,000 years. Using the BLM visual impact methodology, the EIS in Section 4.1.11 characterizes the potential visual impacts of the on-site disposal alternative as high during remedial operations and moderate over the long term. Given the significant economic growth of Moab in recent years in the presence of the existing tailings pile, future negative economic impacts from a capped pile could be argued. However, based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.
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Document #488 Comment #7 Commentor: Sakrison, Dave

III White Mesa Mill Disposal Alternative

The City of Moab is strongly opposed to moving the tailing pile through the City by truck or slurry pipeline. Downtown Moab is classified by the Utah Department of Transportation as a very congested area. The additional 275% increase in downtown truck traffic from 642 to 1,458 trucks, even when spread over a 20 hour day, would create a dangerous situation. Construction of a slurry line would remove much of the truck traffic but it would not eliminate it entirely. %00,000 tons of radioactive materials would still have to continue to travel through downtown Moab. A slurry line would have to be constructed along an already heavily used utility easement. This easement already contains highly volatile gases. Given the type of slurry material to be transported, the possibility of radioactive leaks or breaks is too high. The risk of exposure by truck or slurry accidents is unacceptable.

Response:

The comment accurately reflects the transportation statistics in the EIS. However, DOE does not agree that truck or slurry transportation would create an unacceptably dangerous situation.
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Document #488 Comment #8 Commentor: Sakrison, Dave

The route of the proposed slurry corridor would place the line beneath the Colorado River and through protected wetlands. The 430 acres of pipeline disturbance needed to reach the White Mesa Mill site would have adverse impacts on previously revegetated areas. The 28.7 miles of new right of way would also have negative impacts on the environment. Wetland areas could be compromised, and endangered species threatened. There is an estimated 51 to 101 cultural sites along the slurry route that would be affected in addition to the 5 potential cultural sites at White Mesa itself. Surface and ground water are also threatened by the storage of the tailings at this site. The prudent federal action is to not unnecessary endanger the residents of Moab or the surrounding environment by moving the tailings south to the White Mesa Mill for deposal and profit.

Thank you for considering our concerns on the need to move the Atlas Tailings Pile from the banks of the Colorado River.

Response:

The Department acknowledges the opposition to the Atlas tailings pile being moved to the White Mesa Mill site by pipeline or truck and finds the commentor's characterization of the affected environment and impacts to be consistent with the EIS. DOE will take these issues into consideration in its final decision-making.
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Document #504 Comment #1 Commentor: Suarez, Michael K.

The pile cannot be capped in place. The tailings are leaking toxic hazardous materials into the Colorado River. They threaten to contaminate the Matheson wetlands. If floodwaters reach the pile, the Colorado River will be contaminated by those tailings, endangering those who rely on the river for drinking water and recreation. The worse the flood, the greater will be the contamination.

The Department of Energy (DOE) studies and conclusions concerning the tailings pile are fatally flawed. In spite of all contrary evidence, DOE concludes the river is migrating away from the pile; actually, it is migrating towards the pile. DOE's assessment, limited in scope, contains other unsubstantiated assumptions. Flaws in the report have been noted in articles by Dr. John Dohrenwend, published in the Moab Times-Independent on January 27, February 3 and February 10, 2005: His conclusions and supporting evidence are also contained in his "Preliminary Review of the Department of Energy's Assessment of Potential Flood Hazards at the Moab Project Site (Atlas Tailings Pile)". His e-mail address is dohrenwend@rkymtnhi.com.

Remediation of the pile must not be done "on the cheap" by, for example, leaving the pile in place or moving it in a manner which allows dust from the pile to be dispersed into the air that Moab's citizens breathe. Remediation in a manner dangerous to us, just because it's cheaper, masks the real costs of uranium mining and misleads citizens facing mining operations in their communities.

Crescent Junction storage puts the pile at the location furthest from human activity. It would also be cheaper than a slurry pipeline to White Mesa.

Thank you for your time, attention and consideration.

Response:

Table 2−33 in the EIS addresses the potential for river migration and the potential for catastrophic floods, regardless of the cause of the flood, and the consequences of these events should they occur. Also, Section 4.1.17 discusses the potential natural processes that could cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks.

Recognizing that windblown tailings and other contaminated material may create fugitive dust emissions, the EIS states that dust control would be a component of both the on-site and off-site disposal alternatives. A dust control system would be implemented following the provisions of the Fugitive Dust Control Plan for the Moab, Utah, UMTRA Project Site (DOE 2002a), which complies with State of Utah requirements specified in the Utah Administrative Code titled "Emission Standards: Fugitive Emissions and Fugitive Dust" (UAC 2000). Water for compaction and dust control would be drawn from the Colorado River. Dust suppressants such as calcium chloride, which would be stored in tanks, may also be used. Water would be stored in tanks or in the existing water storage ponds and applied only as needed, using the most economical and efficient delivery method.

Document #504 Comment #1 - response continued

Possible air quality impacts and human health impacts of transportation under the off-site disposal alternatives are also addressed in the EIS (Chapter 4.0 of the EIS and Appendix H). Transportation of contaminated materials from the Moab site to one of the three off-site locations would result in the exposure of workers and the public to very small amounts of radiation. These exposures would not be expected to result in any latent cancer fatalities to any population.

DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.
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Document #505 Comment #1 Commentor: Suarez, Mary

I am a Moab resident. My husband and I moved here to retire and plan to live here the rest of our lives. We are very concerned about what happens to the mill tailings not only for our selves but for the young families and children who live in Moab.

The Moab mill tailings have been a serious problem for many years. We cannot delay; the tailings must be moved now to Crescent Junction by rail.

There are many flaws in the DOE report regarding the river migration which undermine the safety of leaving the pile where it is.

There is no mention of a near certain flood along the Colorado River (2002 National Research Council report) and the catastrophic effects that would cause. The damage to people and communities not only in Moab but all the way down stream would be catastrophic if this uranium pile is washed into the river. The contamination would cause the entire river to be closed off for generations. This would affect 25 million people living in Utah, Nevada, Arizona and California.

As a resident of Moab I am concerned about the current contamination of ground water which affect us now and everyone else down stream.

Mill tailings have been moved from Grand Junction, Rifle and Durango because they were close to a river. Now is the time to move the Moab pile.

The residents of Moab need to know that enough money will be put into the moving of this pile to mitigate blowing contaminated dust unto our community during the move.

We expect and deserve action now.

Response:

Table 2–33 in the EIS addresses the potential for river migration and the potential for catastrophic floods, regardless of the cause of the flood, and the consequences of these events should they occur. In particular, Section 4.1.17 discusses the potential natural processes that could cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks. Ground water contamination and DOE’s proposed remedial action are also assessed in the EIS.

Recognizing that windblown tailings and other contaminated material may create fugitive dust emissions, the EIS states that dust control would be a component of both the on-site and off-site disposal alternatives. A dust control system would be implemented following the provisions of the Fugitive Dust Control Plan for the Moab, Utah, UMTRA Project Site (DOE 2002a), which complies with State of Utah requirements specified in the Utah Administrative Code titled “Emission Standards: Fugitive Emissions and Fugitive Dust” (UAC 2000). Water for compaction and dust control would be drawn from the Colorado River. Dust suppressants such as calcium chloride, which would be stored in tanks, may also be used. Water would be stored in tanks or in the existing water storage ponds and applied only as needed, using the most economical and efficient delivery method.

Document #505 Comment #1 - response continued

Possible air quality impacts and human health impacts of transportation under the off-site disposal alternatives are also addressed in the EIS (Chapter 4 of the EIS and Appendix H). Transportation of contaminated materials from the Moab site to one of the three off-site locations would result in the exposure of workers and the public to very small amounts of radiation. These exposures would not be expected to result in any latent cancer fatalities to any population.

DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.

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Document #515 Comment #1 Commentor: Millard, Charles

As a certified HAZWHOPPER First Responder & D.O.T. Certificate holder since 1993, Receipt #30194, I was most interested in responding in regards to the SUPERFUND site at Moab, Utah. I think what struck me first, was the photograph the San Diego Union ran of the site on 2/13/05. If this is representative of the conditions at the stockpile area today, I think it would be even harder to delay site remediation. There seems to be a lack of even the most fundamental controls in place to provide containment, and even less in place to prevent intrusion by the river, only 750 feet away.

It was only after a long hard lessons did we learn of the dangers our own careless disposal of wastes during our countries nuclear programs. These learned lessons would become realized with the SUPERFUND creation and 29 CFR regulations that followed. The most important sites slated for remediation always included the same important factors, containment and groundwater sources, along with the obvious health dangers to vast areas having contaminated water supplies for years to come. Savanna River Project sat on a aquifer that was the water supply of many southern states that had no idea that a site so far away would affect them or their health. Hanford, on the Columbia River, contaminated God knows how many lives and trillions and trillions of gallons of water, the effects to be learned only after hundreds of years of studies.The Rocky Mountain Flats site had material that escaped containment that wasn't detected until the barrels that were to be moved were found to be empty and the groundwater in the area is still contaminated and will be for years to come. We all remember Love Canal and the terrible price paid by citizens who had no idea of what was in their back yards. Yet today, we seem to sit here and ignore these lessons and continue to pollute the things that are in fact, the very essence of life on this planet. Water is what makes Earth different from all other known planets in our solar system. It is the reason for life being here, period.

The reason for delaying action at this site can only be classified as gross negligence. The only other reason being gross ignorance. Any person with the least bit of training or experience knows the guidelines are clear. The SUPERFUND mandates are very precise on what must be done at this site. There has been a Presidential order to your Department to remove the stockpile and remediation of the groundwater. I really don't understand why we are waiting for some, as yet, unappointed undersecretary of the Department of Energy to make a decision that has already been made time and time again. Further delays, lack of funding by the current administration, leaving the pile in place, would all constitute violations of the law. These laws were enacted to protect both the people and the resources that are placed under your Departments control.

To close, I see the option of transporting the waste to a mill to dispose of the waste in a pipeline as the safest, most responsible means of correcting the problem. Putting trucks on our highways laden with these compounds to go bury them some place else seems very shortsighted and unacceptable. After all, there is no reason to delay action further. Get the funding required to accomplice the task at hand, and GET IT DONE! Or maybe you would like to drink the water from this irreplaceable source that so many of us depend on.

Document #515 Comment #1 - continued

Response:

The Moab uranium mill tailings site is not a Superfund site. It is regulated pursuant to UMTRCA. DOE was given responsibility for the site in 2000. Since that time, DOE has instituted environmental controls and interim actions at the site. DOE has also implemented a pilot-scale ground water extraction system to reduce the mass of ground water contaminants discharging to the Colorado River and thereby reduce ammonia and uranium concentrations discharging to the river. The commentor's support for off-site disposal using the slurry ipeline mode of transportation is noted, and DOE will consider it along with other views in its decision-making.

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Document #527 Comment #1 Commentor: Tielens, Arthur J.

According to above captioned article in the San Diego newspaper, the public is invited to comment as to how the Department of Energy should deal with the toxic metallurgical waste deposit

Apparently, two past proposals have recommended to dig up the waste pile and relocate the waste material some 30 miles away, at an area where ground water pollutiuon could be (largely) prevented by placing a synthetic liner. In such case, pumping the waste material would likely be more economical than trucking, assuming the toxic material has thixotropic properties which is usual the case when handling metallurgical waste material. Obiously, the drainage of the displaced material must be dealt with since it will contain toxic chemicals. To minimize drainage, the deposited waste could be treated with burnt lime. Economics will decide the practicality of this approach. These two proposals will eliminate the danger of further contaminating the Colorado river.

The third option recommends to pipe the waste material to a milling operation where the radio active component would be removed. In such case, the remaining toxic waste has to be dealt with and a "new" totally enclosed waste disposal system must be put into place, in accordance with the environmental rules and regulations. This proposal has also the advantage of not further contaminating the Colorado River.

The fourth option would be to cover the waste pile with an adequate thick layer of impervious clay. It can be assumed that in such case precipitation will not penetrate the pile to a great extent and that it can be removed from the pile by a proper drainage system. However, this fourth proposal has the following disadvantages.

-Drainage of toxic compounds (inside the pile) will continue polluting the ground water. It is not known as to the magnitude of such ground water pollution as the News Article does not indicate whether the original disposal site has been provided with a synthetic or clay seal , nor gives the News Article information on the design of the drainage sytem.

-The pile is close to the Colorado River and heavy river flooding could entrain the toxic materials into the river water, with disastrous consequences.

Relocating the toxic waste some 750 feet further from the river may prevent such a scenario. However the cost my not be appreciably below the cost of removing and relocating the waste deposit elsewhere to an area where precipitation is low and control of preciptation drainage can be optimized.

From the environmental viewpoint, my conclusion would be to remove the waste pile as given in case 1, 2 or 3. However, it should be emphasized that scant information is available to the undersigned so that a final recommendation cannot be given as to the optimum method to deal with the toxic deposit.

Document #527 Comment #1 - continued

The following information is needed to give final recommendation:

1. Detail chemical analysis of the toxic waste

2. Detail physical analysis of the metallurgical waste, such as particle size distribution, permeability and thixotropic charteristics of the deposited waste.

3. Temperature, precipitation and evaporation data at site, average monthly, daily and duration of maximum intensity.

4. Location of water table

5. Wind velocites, monthly average, daily maximum and its maximum duration

6. Earth quake conditions at site

7. Availabilty of nearby impervious clay material

8. A visit to the present and future waste disposal sites

The undersigned has extensive experience in the design and operation of toxic metallurgical waste disposal systems, in North and South Americas, Europe, the Middle East, India and Australia and is at your disposal for arriving at the optimum economic and environmental decision as to dealing with the described toxic waste pile at Moab, Co.

Response:

The EIS addresses the potential environmental impacts of both on-site disposal and off-site disposal at one of three locations (Klondike Flats, Crescent Junction, and White Mesa Mill) using one of three transportation methods (truck, rail, or slurry pipeline); ground water remediation is also analyzed. The EIS includes the information that the commentor indicates is needed for decision-making.
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Document #535 Comment #1 Commentor: Moran, Mary

I have attended some of the scoping meetings, public hearings, and the National Research Council meetings in Moab since 1991 concerning the fate of the Atlas/Moab Tailings pile. I've written letters before and commented in the National Research Council meetings. I now submit these comments on the draft EIS. My basic advice is to move the pile, move it north, and move it now.

Response:

DOE has considered input from the public throughout the preparation of the EIS. This input has been instrumental in the identification of off-site disposal at Crescent Junction using rail and active ground water remediation as the Department's preferred alternatives. DOE will continue to consider the comments received as it finalizes its decision.
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Document #535 Comment #2 Commentor: Moran, Mary

The proposal to ship wastes to the White Mesa site is not only the most expensive, it is ridiculous to think of imposing this on the White Mesa Ute Tribe, ridiculous to think of using the Colorado River's over-allocated water to slurry the waste across or under the Colorado River, through The Nature Conservancy wetlands and the town of Moab (both of which would fight it intensely, which I don't believe is mentioned in the DEIS) and then on for another 80 miles to the disposal site.

Response:

Section 2.7.3 identifies the White Mesa Mill slurry alternative as the most expensive of the alternatives considered. Section 4.1.12 states that this alternative would require approximately 70 acre-feet per year of nonpotable water, approximately 3 percent of the water rights DOE currently possesses (3 cfs of consumptive water rights and 3 cfs of nonconsumptive water rights). Section 2.2.4 states that 80 percent of the slurry water would be recycled for reuse in the slurry pipeline system and that approximately 400 gpm would be required for makeup water. Routing a pipeline under the Colorado River and through the Matheson Wetlands Preserve is technically feasibly and has already been done for natural gas pipelines.
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Document #535 Comment #3 Commentor: Moran, Mary

Most of my comments in this letter will concern a few of the many, many reasons that the alternative for capping the pile in place is a bad one. But first, I have a general comment. The DEIS quoted one part of the Floyd Spence Act, passed by Congress in 1999, saying that the "DOE prepare a remediation plan to evaluate the costs, benefits, and risks associated with various remediation alternatives." But they didn't mention the part of the act that said that the pile was to be moved off site. Here is the language: "Remediation Subject to the availability of appropriations for this purpose, the Secretary shall conduct remediation at the Moab site in a safe and environmentally sound manner that takes into consideration the remedial action plan prepared pursuant to section 3405 (i) of the Strom Thurmond National Defense Authorization Act for fiscal Year 1999 (10 U.S.C. 7420 note; Public Law 105 261), including-

(A) ground water restoration; and

(B) the removal, to a site in the State of Utah, for permanent disposition and any necessary stabilization, of residual radioactive material and other contaminated material from the Moab site and the floodplain of the Colorado River."(emphasis added)

What could possibly be DOE's reasoning for not including this directive? Most other uranium mill tailings piles have been moved. In fact, all of those in river floodplains except for the largest one on the largest wildest river have been moved. And that is the tailings pile that this DEIS addresses.

Response:

The Floyd D. Spence Act also states "The Secretary of Energy shall enter into arrangements with the National Academy of Sciences to obtain the technical advice, assistance, and recommendations of the National Academy of Sciences in objectively evaluating the costs, benefits, and risks associated with *various remediation alternatives, including* removal or treatment of radioactive or other hazardous materials at the site…" [emphasis added]. Consequently, DOE has complied with the Floyd D. Spence Act by evaluating various remediation alternatives, including both on-site and off-site disposal.
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Document #535 Comment #4 Commentor: Moran, Mary

1. The DEIS concludes that the pile is unlikely to flood in the next 200 years, other than possible slow overbank waters touching the nearest toe of the pile (as happened in 1984, at a 70,000 cfs flow). At the recent public meeting in Moab, and in analysis by geologist John Dohrenwend and other experts, numerous reasons for disagreement with the DOE analysis of the likelihood of flooding were laid out, and I will not repeat them all here.

Response:

In Section 4.1.3.1, the EIS acknowledges the potential for flooding of the tailings pile if the on-site disposal alternative were selected and quantifies the impacts that could result from such inundation. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. If on-site disposal were selected in the Record of Decision, the disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the already low probability of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. Section 4.1.17 in the EIS addresses impacts from a catastrophic cell failure due to natural phenomena. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if on-site disposal were selected.

There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these opposing views (Section 2.6.4).

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Document #535 Comment #5 Commentor: Moran, Mary

One factor I didn't hear addressed at the meetings or in my look at the DEIS is the possibility of a dam failure upstream. Most of the time the upstream dams, especially Blue Mesa and Morrow Point Dams on the Gunnison River and McPhee on the Dolores River, but also the many small dams on all tributaries upstream, probably decrease the magnitude of snowmelt high flows on the Colorado River. They're not giant dams and they're a long ways upstream, so might not influence the floods tremendously, but there is some influence. However, dams upstream mean that there is the potential for dam failure upstream.

Consider Glen Canyon Dam in the late spring of 1983. The flow of the Colorado River in Grand Canyon just downstream of that giant dam had had much smaller seasonal highs since the dam went in twenty years earlier. Flow was largely controlled by power demands. But that spring the reservoir behind the dam was almost full, the mountains had an unusually high snowpack, and then there was a regional warm spell with a bunch of rain. Perhaps dam managers have learned from almost losing this dam that year to keep more room in the reservoirs for the vagaries of spring snowmelt. And perhaps not. In 1983, when Glen Canyon Dam was shaking, the spillway outlets were spewing out red sand and house size boulders coming from the bedrock below the dam, and the river was flowing almost 100,000 cfs in an effort to get rid of water before it rose over the top of the dam, we saw the unpredictability of what can happen with a river. If that dam had gone, Hoover Dam and every dam downstream would have gone with it, not to mention the people living along the river from Glen Canyon Dam to the Colorado River Delta in Mexico.

The dams on the Dolores and Gunnison aren't as big as Glen Canyon, but if the upper Gunnison dam went, the next one downstream would go, and that would generate a bigger flood than nature could have done on its own before dams came into play.

Response:

DOE did not analyze specifically the sudden release of water from the dams upstream of the Moab site, but in Section 4.1.17, DOE did analyze the impacts of a catastrophic flood (300,000 cfs), which is the NRC-specified PMF. DOE determined that such a flood would not have sufficient force to cause failure of an on-site disposal cell with engineered mitigation measures such as side slope armaments. However, for purposes of comparative analysis in the EIS, DOE assumed that this highly unlikely failure occurred and quantified the impacts in Section 4.1.17.event. This is will be one factor of many that will be evaluated when DOE selects the disposal site and method in the Record of Decision.

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192 and that the cell would comply with the minimum maintenance standard. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.

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Document #535 Comment #6 Commentor: Moran, Mary

The DOE person responsible for choosing the preferred alternative should take a long and close look at the historic photos of the 1917 flood in the Moab Valley, when the Colorado River flowed at 76,000 cfs. They should be sure to compare the limits of the flooded area with a present-day map or photo of Moab. They should think about the much larger flood in 1884, when the river flowed at approximately 125,000 cfs. Then they should think carefully about the unpredictable nature of floods on this river, the dams upstream, and the fate of the town of Moab and the 26 million people downstream who use the water. Unfortunately, the DEIS has misleading discussion about the likelihood of a large flood, and ignores some factors that could add to the likelihood. And the key is that if there is ANY possibility of flooding the pile in the next 1000 years, the pile should be moved.

Response:

DOE acknowledges the commentor's concerns regarding uncertainties associated with on-site disposal of the tailings near the Colorado River.

DOE considered historical data in its analysis of flood impacts. DOE will consider the potential impacts of flood events analyzed in the EIS under the on-site disposal alternative as input in its final selection of a disposal alternative in the Record of Decision.

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.

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Document #535 Comment #7 Commentor: Moran, Mary

2) The DEIS downplays the impacts that a large flood event would have on the town of Moab and on the 26 million people downstream.

The DEIS assumes that contaminants would wash downstream of Moab and disperse to safe levels relatively quickly, and that there would be no issues downstream beyond Lake Powell. But various toxins attach themselves to silt or clay particles, or exist in heavier compounds, and disperse differentially, thus settling out and concentrating in specific settings, such as backwaters along the river or the deeps of Lake Powell. We simply do not know enough to be able to predict where different toxic substances would concentrate, or how far downstream they might disperse.

If a flood inundates the pile, it will probably inundate the Matheson Wetlands across the river, and perhaps parts of Moab adjoining the wetlands. If some of the toxic materials make it across the river, and fine clays concentrated with toxic compounds settle out, what will be the short-term and long-term health and economic effects on the people of Moab? Will they have to be re-settled elsewhere while the valley is decontaminated over a number of years? The DEIS does not address this scenario.

Response:

In Section 4.1.17, the EIS addresses the expected consequences of a hypothetical catastrophic or long-term failure due to natural phenomena, such as flooding. As stated in the EIS, DOE believes the likelihood of a significant release from such an event would be very small over the design life of the on-site disposal cell. Nonetheless, such a failure was assumed to occur in order to evaluate the potential consequences. The EIS acknowledges the potential for radium226 concentrations in areas where suspended sediment settles out to be well above the 40 CFR 192 cleanup standard.

DOE believes the scenarios addressed in the analysis are sufficient to bound the environmental and health impacts from the highly unlikely event of a catastrophic cell failure.
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Document #535 Comment #8 Commentor: Moran, Mary

The DEIS assumes that in the case of a flood breach to the pile, the contaminants won't go beyond Lake Powell, and since all there is in between Moab and Lake Powell is a 110-mile river canyon with no people living there, that no humans would be impacted. First of all, this stretch is a gorgeous river canyon largely within Canyonlands National Park, home to a complex ecosystem of wildlife and plants including endangered fish that depend on the river, and home to a multi-million dollar per year river rafting industry. Second, it isn't clear what vision the preparers of the DEIS had of Lake Powell over the next 200−1000 years or beyond. Did their modeling assume a static Lake Powell of 20 years ago, filled to the brim, or the current Lake Powell, half empty due to drought but containing much more sediment fill from the river inputs of the intervening years? Or did they model change in Lake Powell over the years, and its eventual demise when it fills with sediment? Lake Powell is definitely not a permanent entity, and the toxins in the waste will outlive the reservoir by orders of magnitude.

Response:

The catastrophic failure analyses (Section 4.1.17) were done as a screening tool to inform decision-makers of the possible differences among the on-site and off-site disposal alternatives, even though DOE believes that there are no plausible mechanisms for such a failure.

Based on these analyses, the short-term impacts at Lake Powell would be expected to be limited; in the long term, degradation of contaminants such as ammonia and further sedimentation would further reduce risks.

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Document #535 Comment #9 Commentor: Moran, Mary

Most of the 26 million people downstream who use the water live in southern California. Some live in the Imperial Valley and irrigate food crops sold all over the U.S. with Colorado River water. Some water users are over the border in Mexico, where the last of the Colorado River is used up in agricultural fields. The US is required to deliver a given amount of water of a certain quality to Mexico each year. Back in the early 1990s, the water was too salty by the time it reached the border, so the US government installed a desalinization plant near the border in Yuma, which cost $280 million at the time. (It was closed down after nine months because of design flaws.) What will it cost us to clean up the water if the tailings pile ends up going this far downstream?

Response:

As stated in Section 4.1.17, which identifies the impacts associated with the highly unlikely event of catastrophic disposal cell failure and release into the river, a major tailings release is not anticipated to significantly increase risks to human populations downstream of Lake Powell, and the water quality impacts would be short-term. Therefore, no water treatment costs are anticipated should this unlikely event occur.

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Document #535 Comment #10 Commentor: Moran, Mary

3) The DEIS concludes that the river is most likely to move to the south if its course changes, but this conclusion seems erroneous. It seems entirely possible that the river channel could migrate toward the pile in the next 200 to 1000 years. It also seems possible that it may migrate away from it. And it seems most likely, at least on the 1000-year time scale, that it will do both, because that is what rivers do when they are not constrained between canyon walls. There is evidence in the coarse cobbles in boreholes below the pile that the river was once there.

Response:

Section 4.1.17 and Section 2.6 of the EIS discuss the potential for the Colorado River to migrate and damage the tailings pile if the tailings were not relocated. There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these opposing views (Section 2.6.4). If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials would be sized to withstand the maximum river forces recently identified by USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment. The final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan if the on-site alternative were selected. The estimated cost range for remediation (shown in Table 2−33, item #9) would accommodate materials consistent with the recent USGS report.

Section 4.1.17 of the EIS addresses a failure of the disposal cell at the Moab site and the expected consequences and potential risks. These would include impacts to downstream users, aquatic receptors, backwaters, terrestrial biota, and adjacent areas. The focus of the analysis is to evaluate the potential consequences of contaminants in the water and sediments of the Colorado River based on a significant (catastrophic) release of tailings. Although the probability of a significant release would be very small over the design life of the on-site disposal cell, this type of failure was assumed to occur in order to evaluate the potential consequences (risks).
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Document #535 Comment #11 Commentor: Moran, Mary

4) Time scales seem poorly considered in the DEIS. First of all, many of the toxins have half lives such that they will have seen little change 200 to 1000 years from now. And why do we disregard human and other life in a time frame as short as 200 years from now anyway?
But the DEIS doesn’t even seem to fully consider the 200 to 1000 year time frame. What effect will global warming have on flood cycles? Will Lake Powell still be in place? Does the likelihood of dam failure upstream increase as these dams age? Are more dams likely to be built, and would this make dam failure even more likely? How many people might be living in the Moab Valley, and how likely is it that they will be drawing water from the river?

Response:

DOE’s performance modeling of on-site and off-site disposal specifically addresses the required regulatory time frame of 200 to 1,000 years. In some areas, such as ground water travel times or subsidence of Moab Valley, the analyses look many thousands of years into the future. Flooding consequences of an on-site disposal alternative are assessed in Section 4.1.3.1. Design features that would enable an on-site disposal cell to withstand a PMF are included in Section 2.1.4. Catastrophic failure is assessed in Section 4.1.17. The potential consequences of global warming on flooding frequency are too highly speculative to assess at this time. Ground water beneath the pile is naturally saline from dissolution of the underlying Paradox salt basin, and this resource would not be available for future populations under any circumstances.
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Document #535 Comment #12 Commentor: Moran, Mary

Certainly it would have been difficult for the Anasazi to imagine life as it is in the Moab Valley 1000 years after they lived here, and likewise we cannot fully imagine what life will be like here in 1000 years. But the point is, if we cannot imagine it, and we are mandated to manage the wastes for such a period, then we must do the safest thing: Move the pile out of the flood plain to a safer location. Don’t cap it in place and then have to dig it up and move it later; do it right, now.

Response:

See response to comment #1.
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Document #536 Comment #1 Commentor: Le Montre, Sue

If this pile is as large as is publicized, how feasible would it be to bring a commercial mill to Moab in order to dispose of the pile? It could be cheaper to bring the mill to the mountain than to set up a pipeline to move the pile.

Apparently it has already cost 2 billion to move 22 other piles around the country. What would it cost to have a portable mill which could be moved to the site, such as a crematorium?

Response:

The uranium mill tailings at the Moab site are the result of historical uranium-ore processing at the site. The tailings are waste material and cannot be further processed in a mill. The tailings must be disposed of either on the site by stabilizing and capping the pile or off the site by removing the materials from the Moab site and transporting them to another location for disposal.
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Document #537 Comment #1 Commentor: Maia, Maia

What we need is a completely new Environmental Impact Statement to address the full reclamation of 12 million tons of uranium wastes that are, each and every day, contaminating the Colorado River near Moab, Utah.

This new EIS should strongly reject the idea of capping the radioactive waste on the bank of the Colorado River, and should instead recommend moving the waste to one of two nearby Utah sites - Klondike or Crescent Junction.

It is simly not acceptable to leave 12 million tons of mill waste to leak into the Colorado River where it is almost certain to be inundated by floods, thus contaminating the water citizens and farmers require for life and health.

Away from the Colorado River, the Klondike and Crescent Junction sites are in extremely stable, isolated areas that meet all the criteria for long-term disposal of radioactive wastes.

Every savings from resorting to capping will be offset by the much greater costs of containment-failure and cleanup.

Response:

NEPA requires federal agencies to analyze the potential environmental impacts of any proposed major federal action that may have significant impacts on the human environment. NEPA also requires that agencies evaluate all reasonable alternatives to the proposed action. Accordingly, in the Moab EIS, DOE analyzed the potential environmental impacts of both on-site and off-site disposal. DOE also analyzed the impacts of ground water remediation. DOE will consider the commentor’s views in its decision-making.

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Document #539 Comment #1 Commentor: Rivera, Madeline

As a citizen who relies on the Colorado River for drinking water, I am extremely concerned about an accident waiting to happen. I urge you to prepare a new Environmental Impact Statement (EIS) for the final reclamation of 12 million tons of uranium wastes that are contaminating the Colorado River near Moab, Utah.

The radioactive wastes are now located in an unlined pile within the floodplain of the river and are leaking approximately 12,000−15,000 gallons per day of intensely contaminated fluids into an underground aquifer that immediately discharges into the river. This site fails every test for an appropriate site, since it does not provide long-term isolation from the human and natural environment below ground that will endure without the need for ongoing maintenance.

I urge you to prepare a new EIS that (1) dismisses the alternative of capping the radioactive waste at its current site on the bank of the Colorado River, and (2) instead identifies a preferred alternative of moving the waste to one of two nearby Utah sites - Klondike or Crescent Junction. These sites are in extremely stable, isolated areas that meet all the criteria for long-term disposal of radioactive wastes.

Thank you for your consideration.

Response:

NEPA requires federal agencies to analyze the potential environmental impacts of any proposed action that may have significant impacts on the human environment. NEPA also requires that agencies evaluate all reasonable alternatives to the proposed action. Accordingly, in the Moab EIS, DOE analyzed the potential environmental impacts of both on-site and off-site disposal. DOE also analyzed the impacts of ground water remediation.

The commentor does not suggest that the analysis in the Moab EIS is inadequate, only that a new EIS should be prepared that rejects the alternative of on-site disposal. DOE has considered input from the public throughout the preparation of the EIS. This input has been instrumental in the identification of off-site disposal at Crescent Junction using rail and active ground water remediation as DOE’s preferred alternatives.

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Document #547 Comment #1 Commentor: Angel, Bradley

On behalf of our constituents living in communities along the Colorado River south of Moab in California, Arizona and Nevada, we request a three week extension of the public comment period on the draft EIS. I have recently been notified that some of these constituents, including Native Nations along the Colorado River, may be interested in submitting comments. Please let me know if the comment period can be briefly extended. Thank you.

Response:

The comment period lasted for 90 days, double the regulatory requirement of 45 days. DOE believes that this period was sufficient to allow meaningful review and comment. However, DOE did address comments received after the public comment period officially ended.
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Document #549 Comment #1 Commentor: Ute Mountain Ute Tribe

Beginning in the spring of 2002, the Ute Mountain Ute Tribe voiced its opposition to the International Uranium Corporation ("IUC") alternative, an alternative that proposes to transport the Atlas pile to the IUC facility located adjacent to the Ute Mountain Ute Tribal community of White Mesa, Utah. Via Resolution #2002-60 (copy enclosed), the Ute Mountain Ute Tribal Council opposed the construction of the slurry line to the IUC facility and the transportation of the materials to the operation. On February 14, 2005, the Tribal Council, through Resolution #2005-021 (copy enclosed), reaffirmed its opposition to the IUC alternative for remediation of the Moab Uranium Mill tailings. The February 14, 2005 Resolution of the Tribal Council opposes the IUC facility from receiving mill tailings, contaminated soils and cover materials regardless if the mode of transportation is by slurry line or truck. As you are aware, there has been, and continues to be, strong opposition to the IUC alternative from a majority of the community members of White Mesa who would be most impacted by that particular alternative.

In addition to the Ute Mountain Ute Tribe, the Southern Ute Indian Tribe and the Navajo Utah Commission of the Navajo Nation Council have both joined the chorus of voices opposing the IUC alternative. Copies of the letter from the Chairman of the Southern Ute Indian Tribe and Resolution NUCJUN-293-03, by the Navajo Utah Commission of the Navajo Nation Council, are enclosed.

Response:

DOE respects the opinions of the Ute Mountain Ute Tribe, the Southern Ute Indian Tribe, and the Navajo Nation and their objections to the White Mesa Mill alternative. Section 4.4 of the EIS quantifies the impacts that would occur under this alternative. The tribes were instrumental in providing the information needed to accurately characterize the unique negative impacts that would occur to cultural resources and traditional cultural properties (Section 4.4.9) and environmental justice impacts under this alternative (Section 4.4.18). DOE will continue to consider the opinions of the Ute Mountain Ute Tribe in its final decision-making.
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Document #549 Comment #2 Commentor: Ute Mountain Ute Tribe

When International Uranium Corporation first offered their unsolicited proposal to DOE, their plan noted how the city of Moab would benefit from the relocation of the Atlas Pile. Their proposal neglected to discuss any impacts to the community of White Mesa, its air, its water, its people and most important, its future.

Fortunately, the Draft EIS paints a far clearer picture of the negative impacts associated with the IUC alternative. Throughout the drafting of this document nearly all of the Cooperating Agencies involved have been aware of the issues that should have removed the IUC alternative from consideration early in the process.

Response:

DOE is aware of the objections raised by the Ute Mountain Ute Tribe, the Southern Ute Indian Tribe, and the Navajo Nation over the assessment of the White Mesa Mill alternative in the EIS. DOE's interpretation of the requirements of NEPA to evaluate "all reasonable alternatives" necessitated the inclusion of the site in the EIS.
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Document #549 Comment #3 Commentor: Ute Mountain Ute Tribe

The negative impacts and features of the IUC proposal are very clear.

COST- The IUC alternative could cost upwards of $75 million dollars more than the Klondike Flats option, especially when considering the unknown Cultural Resource and Traditional Cultural Properties issues. The costs associated with these unknown Cultural Resource and Traditional Cultural Properties issues could dramatically increase the total cost of the IUC alternative. The Tribe believes the Draft EIS, by failing to account for these costs, is flawed. If these costs would have been included in the Draft EIS, the IUC alternative would be shown to be an even bigger fiscally irresponsibly alternative. The Tribe asserts that it is simply not reasonable to include for consideration an alternative that, if selected, would saddle U.S. taxpayers with an additional burden of at least $75 million dollars. (DOE EIS-0355-D, Summary S−9).

Response:

No specific dollar estimate could be put on the potential costs of mitigating impacts to cultural resources and traditional cultural properties or of mitigating environmental justice impacts. However, DOE acknowledges this cost liability, which is unique to the White Mesa Mill alternative, in Section 2.6.3 and Table 2−33 of the EIS. DOE will take this issue into consideration in its final decision-making.
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Document #549 Comment #4 Commentor: Ute Mountain Ute Tribe

CULTURAL RESOURCES AND TRADITIONAL/TRIBAL CULTURAL PROPERTIES- One hundred and twenty one (121) prehistoric sites have already been identified as potentially being impacted by the IUC alternatives. Approximately one dozen Traditional Cultural Properties would also be impacted with little opportunity to mitigate those effects. Finally, the unknown; it is anticipated that many other sites will be discovered if construction were to occur increasing costs and delaying the project. (DOE EIS-0355-D, Summary S−9; Volume 1pg. 3−56; pg. 3−155; pg. 3−157; pg. 3−175)

Response:

The comment accurately summarizes the characterization of the affected environment in Section 3.4, which could not have been developed without significant input from the tribes. The impacts to these resources are described in Sections 4.4.9 and 4.4.18 of the EIS. The cost implications are addressed in the response to comment #3.

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Document #549 Comment #5 Commentor: Ute Mountain Ute Tribe

GEOLOGIC INSTABILITY- The potential of geologic instability creating a conduit for contaminants to reach the Navajo Aquifer, the sole source of culinary water for White Mesa and Bluff, Utah is an alarming proposition. In the event, however unlikely, that the Navajo Aquifer underlying the community of White Mesa were to become contaminated there is no alternative currently available to provide water to the community. Although this issue is considered to be a remote risk, it is a risk nonetheless; one with potentially serious and long term consequences. The Tribe strongly believes this risk is reason enough to remove the IUC alternative from consideration. (DOE EIS-0355-D, Summary S−12)

Response:

DOE acknowledges in Section 3.4.5 that the Entrada and Navajo Sandstone aquifers are beneath the White Mesa Mill site and are separated by a significant aquitard that is approximately 1,000 feet thick. If the White Mesa Mill site were selected as the final disposal site, the commentor’s concerns regarding protection of the aquifer would be addressed during the actual engineering design for the cell (see Section 2.2.5). Although DOE believes that the risks associated with the White Mesa Mill alternative are not sufficiently serious to warrant dismissal of this alternative from the EIS, DOE will consider the commentor’s concerns in its decision-making.

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Document #549 Comment #6 Commentor: Ute Mountain Ute Tribe

SOCIOECONOMIC ISSUES- Although jobs would be created during slurry line construction, including positions for Tribal members, the jobs would be few and short lived. Once operating, IUC operations would not provide many more jobs than are already available. Due to the fact that much of the financial information regarding the IUC proposal has been deemed confidential, as proprietary information, the DEIS does not paint a clear picture as to how many and what types of jobs would be available to White Mesa residents. Finally, the short term job benefits do not outweigh the negative environmental impacts.

Response:

Workforce requirements, which are characterized in Section 2.1.5.1 for the on-site alternative and Section 2.2.7.1 for the off-site alternatives, are independent of IUC's proprietary information. The commentor accurately characterizes the assessment of socioeconomic impacts in Sections 4.1.14, 4.2.14, 4.3.14, and 4.4.14 of the EIS. The commentor is correct in noting that the EIS does not attempt to identify specific employment opportunities that would be available to White Mesa residents. Once a final decision is made, federal procurement regulations that encourage employment of Native Americans would be applied to a remedial action contractor.
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Document #549 Comment #7 Commentor: Ute Mountain Ute Tribe

HUMAN HEALTH IMPACTS – By Press Release dated April 15, 2003, the U.S. Department of Energy Grand Junction Office determined to eliminate the Green River alternative from consideration as an off-site alternative for collection of the Moab uranium mill tailings. The Department of Energy determined to delete the Green River alternative based on its proximity to populated areas, among other reasons. The IUC facility is a short distance from the White Mesa community and along a major thoroughfare used by Tribal members on a daily basis. Due to its proximity to the White Mesa community, the IUC alternative should also be removed from the list of potential sites.

Response:

As described in Section 2.5.2, the Green River alternative was dismissed from detailed evaluation due to physical limitations of the site. Specifically, there is insufficient space for the Moab pile between the floodplain of the Green River and I-70. Additionally, members of the public live much closer to that site than to any other site initially evaluated. The human health assessment in the EIS, Section 4.4.15, explicitly considers the numbers and proximity of White Mesa residents in predicting health impacts under this alternative. See response to comment #2 for the rationale for including the White Mesa Mill site in the EIS.
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Document #549 Comment #8 Commentor: Ute Mountain Ute Tribe

ENVIRONMENTAL JUSTICE- On February 11, 1994, President Clinton signed Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7629 (1994). The purpose of the Order is to focus federal attention on the environment and human health conditions in minority communities and low-income communities with the goal of achieving environmental justice. As the Department of Energy correctly points out in the Draft EIS the White Mesa Ute Reservation is adjacent to the IUC site and the area south of the IUC site (including the White Mesa Ute Reservation) has a minority population and poverty rate, both greater than 50%. However, the Tribe believes the Draft EIS fails to adequately address environmental justice issues of the White Mesa community.

Section 1-1 of Executive Order 12898 requires that each Federal Agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. While the Draft EIS adequately identifies the disproportionate adverse impacts, it fails to appropriately address these same adverse impacts. The Draft EIS identifies the "[d]isproportionate adverse impacts to minority and low-income populations would occur under this [IUC] alterative as a result of unavoidable adverse impacts on potential traditional cultural properties located on and near the White Mesa Mill site, the proposed White Mesa Mill pipeline route, White Mesa Mill borrow area, and Blanding borrow area." DOE EIS-0335D, 4.4.18. These disproportionately adverse impacts include at least eleven potential traditional cultural properties that would be unavoidably and adversely affected and the extremely high likelihood that additional traditional cultural properties would be located. The Tribe submits the appropriate manner to address these disproportionately adverse impacts to minority and low-income populations is to remove the IUC alternative from consideration. To do otherwise, fails to comply with the intent of Environmental Justice and dismisses the importance of traditional cultural properties to the Ute people, as well as the Navajo and Hopi cultures.

In addition, the U.S. Department of Energy anticipates dealing with the impacts to these Traditional Cultural Properties and an additional yet unknown number of additional sites at some later date. Dealing with the impacts at an unknown later date is inadequate and contrary to the goal of the Draft EIS, which is to find a preferred alternative.

Response:

DOE has complied with Executive Order 12898 through its consultations with the tribes. Those consultations led to the identification of both cultural resources and traditional cultural properties for all alternatives in Chapter 3.0. DOE concurs with the commentor's identification of environmental justice impacts and has specifically identified these impacts in Section 4.4.18 and in Tables S−1 and 2−32. Section 2.6.3 and Table 2−33 acknowledge the uncertainties regarding cultural resource impacts and the costs that might be incurred for their mitigation, if such is possible. DOE will consider these matters in its decision-making.

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Document #549 Comment #9 Commentor: Ute Mountain Ute Tribe

As a cooperating agency the Ute Mountain Ute Tribe has discussed the uncertainties of all of the alternatives including river migration, duration of workers exposure to radiation, congressional appropriations and cultural resource issues. It can be safely said that the IUC alternative has the most unanswered questions. Based on these uncertainties the Ute Mountain Ute Tribe respectfully requests that the IUC option is removed from further consideration.

Although the U.S. Department of Energy Grand Junction Office has worked closely with the Tribe and other Cooperating Agencies we remain skeptical of the decision making process in Washington, D.C. We encourage the local U.S. Department of Energy staff who have professionally steered the Draft EIS program through the NEPA process to persuade upper management at the Department of Energy's headquarters to utilize sound engineering, rational science, fiscal responsibility, and recognition of the significant opposition of the Ute Mountain Ute Tribe to remove the IUC alternative from consideration.

Response:

As discussed in the response to comment #2, the White Mesa Mill alternative has not been removed from the EIS. However, consideration of the potential impacts of the White Mesa Mill alternative contributed to DOE's identification of off-site disposal at the Crescent Junction site using rail transportation as its preferred disposal alternative.
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Document #549 Comment #10 Commentor: Ute Mountain Ute Tribe

WHEREAS, the Constitution and By-laws of the Ute Mountain Ute Tribe, approved June 6, 1940 and subsequently amended, provides in Article III that the governing body of the Ute Mountain Ute Tribe is the Ute Mountain Ute Tribal Council and sets forth in Article V the powers of the Tribal Council exercised in this Resolution; and

WHEREAS, the Ute Mountain Ute Tribal Council is responsible for programs that will improve the economic, social, and general overall welfare of the members of the Ute Mountain Ute Tribe; and

WHEREAS, the Ute Mountain Ute Tribe has an opportunity to declare a position regarding International Uranium Corporation's proposal to construct a slurry line from the defunct Atlas Mill/Moab, Utah to White Mesa Mill near the tribal community of White Mesa, Utah in order to deliver mill tailings, contaminated soils and cover material to the White Mesa Mill for processing and/or permanent storage; and

THEREFORE BE IT RESOLVED, that the Ute Mountain Ute Tribal Council hereby opposes international Uranium Corporation's proposal to construct the slurry line and to receive the mill tailings and directs the United States Department of Energy to consider other alternatives for remediation of the Atlas Mill tailings that do not impact the tribal community of White Mesa, Utah; and

BE IT FINALLY RESOLVED, that the Chairman of the Ute Mountain Ute Tribal Council is authorized to sign the Resolution and is further authorized to take such action as may be necessary to carry out the intent of this Resolution.

The foregoing Resolution was duly adopted this 13th day of March 2002.

Response:

See response to comment #1.
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Document #549 Comment #11 Commentor: Ute Mountain Ute Tribe

WHEREAS, the Constitution and By-Laws of the Ute Mountain Ute Tribe, approved June 6, 1940 and subsequently amended, provide in Article III that the governing body of the Ute Mountain Ute Tribe is the Ute Mountain Ute Tribal Council and sets forth in Article V the powers of the Tribal Council exercised in this Resolution; and

WHEREAS, the Ute Mountain Ute Tribal Council is responsible for programs that will improve the economic, social, and general overall health and welfare of the members of the Ute Mountain Ute Tribe; and

WHEREAS, the International Uranium Corporation operates the White Mesa Mill near the tribal community of White Mesa, Utah; and

WHEREAS, the Ute Mountain Ute Tribe has an opportunity to declare its position regarding the International Uranium Corporation alternative for the remediation of the now defunct Atlas Mill site/Moab uranium mill tailings; and

WHERAS, on March 13, 2002, the Ute Mountain Ute Tribal Council, by Resolution No. 2002-60, opposed International Uranium Corporation's proposal to receive mill tailings from the now defunct Atlas Mill site/Moab uranium mill tailings. A copy of Ute Mountain Ute Tribal Council Resolution No. 2002-60 it attached.

NOW, THEREFORE BE IT RESOLVED, that the Ute Mountain Ute Tribal Council hereby reaffirms its opposition to the International Uranium Corporation receiving mill tailings, contaminated soils and cover material from the defunct Atlas Mill site/Moab uranium mill tailings; and

BE IT FURTHER RESOLVED, that the Ute Mountain Ute Tribal Council directs the United States Department of Energy to consider other alternatives for remediation of the Atlas Mill site/Moab uranium mill tailings that do not impact the tribal community of White Mesa, Utah; and

BE IT FINALLY RESOLVED, that the Chairman of the Ute Mountain Ute Tribal Council is authorized to sign this Resolution and is further authorized to take such action as may be necessary to carry out the intent of this Resolution.

This foregoing Resolution was duly adopted this 14th day of February, 2005.

Response:

See response to comment #1.
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Document #549 Comment #12 Commentor: Ute Mountain Ute Tribe

This letter is intended to express the support of the Southern Ute Indian Tribe for the Ute Mountain Ute Tribe's stated position opposing the proposal to construct a slurry line from Moab, Utah to the White Mesa Mill near the Ute Mountain Ute White Mesa Community. The Southern Ute Indian Tribal Council understands your concern for your tribal members and the environment if a slurry line is built to transport mill tailings and contaminated soil to the White Mesa Mill for processing or storage, and we share your concern.

Please convey to the United States Department of Energy as well and other decision makers, our opposition to the proposal and our concurrence with your request that alternatives to this proposal be considered.

Response:

See response to comment #1.
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Document #549 Comment #13 Commentor: Ute Mountain Ute Tribe

Whereas:

1. The Navajo Utah Commission was established by the Intergovernmental Relations Committee of the Navajo Nation Council by Resolution No. IGRJN-134-92 to develop and maintain efficient governmental services to the Navajo People residing on the “Utah Strip” of the Navajo Nation; and

2. The uranium industry has left a devastating legacy .with the Navajo people with lingering illnesses and lost of life; the Navajo people are distrustful and suspicious with the additional suffering inflicted by a slow, restitution process; and

3. The Navajo people are rightfully leery of expanding the White Mesa Mill operations by 270 acres and fear accommodation of International Uranium Corporation (IUC)’s relentless quest for, importation of other hazardous, radioactive waste material from across the country; and,

4. The Navajo people have seen disappointment in government projects that accorded minimal respect to traditional beliefs and cultural practices and are anticipating, if any, token translation and presentation of highly technical information to predominately Navajo and Ute speakers regarding the proposed White Mesa Mill expansion; and

5. As citizens of the State of Utah, the Navajo people do not support the further desecration of scenery and environment with construction of an unsightly slurry pipeline of considerable distance.

NOW THEREFORE BE IT RESOLVED:

1. Opposing the transportation, stabilization and storage of Uranium ,Mill Tailings at the White Mesa Mill outside Blanding, Utah, near the Ute Reservation and requesting the U.S. Department of Energy to keep reclamation activities in vicinity of original milling site in Moab, Utah.

Response:

See response to comment #1.
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Document #553 Comment #1 Commentor: Underwood, Dennis—Metropolitan Water District of Southern California

Metropolitan strongly believes that moving the Moab pile off-site is the only reliable and permanent alternative sufficient to protect the Colorado River from further contamination by radioactivity and inorganics. Metropolitan is the primary wholesale provider of supplemental water to Southern California and relies on the Colorado River to supply drinking water to over 18 million people in Southern California within our 5,200 square-mile service area. Filling our Colorado River Aqueduct requires pumping 1,250,000 acre-feet a year of Colorado River water. Metropolitan is providing the following comments on this Draft EIS as a potentially affected public agency.

Response:

DOE has considered input from the public throughout the preparation of the EIS. This input has been instrumental in the identification of off-site disposal at Crescent Junction using rail and active ground water remediation as the Department's preferred alternatives. DOE will continue to consider the comments received as it finalizes its decision.
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Document #553 Comment #2 Commentor: Underwood, Dennis

1. Off-site Disposal is Only Reliable Option for Permanent Protection of Colorado River

Metropolitan strongly supports the off-site disposal option, as this is the only option which offers long-term, permanent protection to the quality of water received by downstream Colorado River users. Metropolitan agrees with the assessment reached by the State of Utah in their December 29, 2004 letter to you that states that any remediation other than an off-site option is unacceptable.

Response:

See response to comment #1.
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Document #553 Comment #3 Commentor: Underwood, Dennis

With both the no action and the on-site alternatives, contaminated seepage will continue to leak from the tailings pile and into the Colorado River. Although the volume of seepage may be reduced with the on-site alternative, Metropolitan finds any seepage into the Colorado River unacceptable.

Response:

The analyses in the EIS demonstrate that under current, unremediated conditions, the effects of site contamination are localized (Section 3.1.7.3). The EIS analyses also support the conclusion that even if a catastrophic failure of an on-site disposal cell occurred (a highly unlikely event), the discharge of 80 percent of the pile into the Colorado River would not extend impacts beyond a few miles downstream of the site (Section 4.1.17).
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Document #553 Comment #4 Commentor: Underwood, Dennis

Metropolitan is also concerned about adverse impacts to the Colorado River from both the no action alternative and the on-site alternative as natural subsidence, river migration, flooding, incision, and disposal cell or tailings pile failure occur.

Response:

A systematic evaluation of geologic processes that could affect the site is detailed in Sections 4.1.1.1, 4.1.3, and 4.1.17 in the EIS. Uncertainties related to disposal cell or tailings pile failure are addressed in Tables S−1 and 2−33.
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Document #553 Comment #5 Commentor: Underwood, Dennis

Additionally, Metropolitan is disappointed there is insufficient analysis to quantify the increase in uranium concentrations to the Colorado River after a catastrophic flood, and what impacts this would have on downstream users. Metropolitan requests that this information be provided in the final EIS.

Response:

Section 4.1.17 of the EIS provides estimates of uranium concentrations in the Colorado River following a catastrophic release of tailings and also lists the assumptions upon which the estimates are based. The EIS analyses support the conclusion that even if a catastrophic failure of an on-site disposal cell occurred (a highly unlikely event), discharge of 80 percent of the pile into the Colorado River would not extend impacts beyond a few miles downstream of the site (Section 4.1.17).
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Document #553 Comment #6 Commentor: Underwood, Dennis

An example illustrating Metropolitan's concerns can be drawn from DOE studies evaluating current and future levels of contamination emanating from the waste pile. The Site Observational Work Plan for the Moab site (SOWP) characterizes the tailings pore water currently migrating from the bottom of the tailings pile as a composition of approximately 1,100 mg/L ammonia, 24,600 mg/L TDS and 7.87 mg/L uranium. The SOWP predicts contamination levels will worsen as water infiltrates into the upper portion of the tailings pile and salt deposits are dissolved. Ammonia concentrations are anticipated to increase to approximately 18,000 mg/L and TDS to approximately 213,758 mg/L (SOWP 6–7 item 6). Therefore, concentrations of ammonia and total dissolved solids (TDS) will roughly increase by an order of magnitude in tailings pore water with both the no action and the on-site alternative. Since previous work has confirmed that "ground water discharge from the Moab site has caused localized degradation of surface water quality (Draft EIS, Page 3–30, Paragraph 6",) these elevated levels of contamination will enter into the Colorado River. The off-site disposal alternative would eliminate this contamination of the Colorado River, as the source of the increasing concentrations of ammonia, TDS, and uranium would be moved along with the tailings.

Response:

The commentor is correct in stating that DOE estimated that the leaching effects of an ammonia salt layer in the upper 10 feet of the tailings pile would not be observed at the underlying water table for about 1,100 years. DOE did not simulate this effect with the flow and transport model or estimate costs because the regulatory time period for the design of the cell is 200 to 1,000 years (40 CFR 192). Furthermore, as discussed in the SOWP (Section 6) attenuation processes (for example, biological degradation and sorption) make it likely that ammonia concentrations in the tailings fluid near the base on the pile would be considerably lower. In addition, since the salt layer is in the upper 10 feet of the pile, it may also be possible to excavate and treat it aboveground before placing the cap. If DOE decided to implement the on-site disposal alternative, further characterization would be conducted and mitigative actions taken if necessary. However, based on the analyses in the EIS and uncertainties such as this, DOE has identified off-site disposal as its preferred alternative.

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Document #553 Comment #7 Commentor: Underwood, Dennis

For the no-action alternative, the pore water impacted with elevated concentrations resulting from dissolution of the salts is expected to enter the groundwater after 168 years from present and be completely depleted after 217 years. After 217 years, seepage of the pore fluids is anticipated to continue with a concentration of 1,100 mg/L ammonia indefinitely. Unfortunately, concentrations are not provided for TDS and uranium in the SOWP.

Response:

The commentor's assessment of the impacts from the No Action alternative is consistent with the information presented in Section 4.6 of the EIS. TDSs and uranium were not modeled explicitly; however, it is anticipated that the concentrations of these two parameters would also remain high under the No Action alternative.

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Document #553 Comment #8 Commentor: Underwood, Dennis

For the on-site disposal alternative, the pore water impacted with elevated concentrations resulting from dissolution of the salts is expected to enter the groundwater at 1,094 years from the present and be completely depleted at 1,536 years. After 1,536 years, seepage of the pore fluids is anticipated to continue at 1,100 mg/L ammonia indefinitely. Again, concentrations are not provided for TDS and uranium in the SOWP. If ammonia contamination from pore water seepage is an indication of the trends expected for TDS and uranium, such contamination must be prevented from reaching the River. Future reliance on the Colorado River as a source of drinking water will only increase further, given the population growth projected for Southern California and this irreplaceable resource must receive the highest level of protection possible. Therefore, the off-site disposal alternative is the only option that reliably provides such permanent protection of the Colorado River.

Response:

The commentor is correct in stating that DOE estimated that the leaching effects of an ammonia salt layer in the upper 10 feet of the tailings pile would not be observed at the underlying water table for about 1,100 years. Although no EPA drinking water or ground water standard exists for ammonia, it was selected for modeling because it is present in the tailings seepage and ground water at concentrations significantly greater than natural background. Also, ammonia is the key constituent driving the proposed ground water remedial action presented in the EIS because of its high concentrations discharging to the Colorado River and its toxicity to aquatic organisms. It is assumed that if ammonia target goals could be achieved that are acceptable for protection of aquatic life, concentrations of the other contaminants would also be protective. Even though the geochemical behavior of the other constituents, such as TDS and uranium, differs from that of ammonia, it is anticipated that these constituents would be protective in the same time frame that it would take for ammonia to reach protective levels because they are less elevated above applicable cleanup criteria (e.g., surface water standards), are less widespread, or occur at elevated concentrations less frequently. For this reason, ammonia is the focus of the transport model evaluation. Section 2.3.1 of the EIS provides further explanation.

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Document #553 Comment #9 Commentor: Underwood, Dennis

2. Continued Seepage of Uranium from Pile Counter to Public Health Protection

As described in Section 1, if the waste pile is left in place, uranium will continue to leak from the site, and may significantly increase. Metropolitan is extremely concerned with any action that could possibly increase uranium levels in our source waters, as the Public Health Goal for uranium in California is 0.5 pCi/L, the Maximum Contaminant Level (MCL) is 20 pCi/L in California, and the federal MCL is 30 µg/h. An approximate conversion from µg/L to pCi/L is that 1 µg/L is equivalent to 0.67 pCi/L. Using this conversion factor, the maximum groundwater concentration of uranium found at the Moab site is reported at 23 mg/L, which is over 750 times higher than the federal MCL.

Further, Metropolitan believes that it is important to safeguard the publics confidence in the reliability of the Colorado River as a drinking water source. Public perception of the negative health impacts from radioactivity must be considered when selecting a remediation alternative. Off-site disposal would ameliorate such concerns.

Response:

The analyses in the EIS demonstrate that even under current, unremediated conditions, the effects of site contamination are localized (Section 3.1.7.3). The preferred alternative includes active ground water remediation, which would further reduce even these localized effects to levels below applicable surface water standards.
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Document #553 Comment #10 Commentor: Underwood, Dennis

3. Salinity from Moab Pile Violates Colorado River Salinity Control Policy

A rise in salinity impairs the usability of any source of water. Increased concentrations of TDS in Colorado River water is of great concern to Metropolitan as it can affect plumbing systems and appliances through the deposit of dissolved salts, industrial processes that depend on lower salinity water, local recycling projects, and groundwater recharge, among numerous other activities. Metropolitan delivers water to our member agencies that does not exceed 500 mg/L TDS, which meets the secondary drinking water standard for California.

Therefore, the alternative selected should at least meet all Colorado River Basin Salinity Control Forum (Forum) policies. The Forum was created by the seven Colorado River Basin states. Forum policies are published in the “2002 Review, Water Quality Standards for Salinity, Colorado River System.” This report is prepared and submitted in response to Section 303(c) of the Clean Water Act and includes the water quality standards numeric criteria and the Plan of Implementation developed and adopted by the Forum. The Plan of Implementation includes implementation of Forum adopted policies. Each of the seven Colorado River Basin states includes the report as part of its own water quality standards, and through procedures established by each state, considers the report, potentially adopts it, and then submits the report to the appropriate Regional office of the U.S. Environmental Protection Agency (EPA) for approval. The California State Water Resources Control Board adopted the Review on Apri130, 2003, and the EPA approved the Review on July 10, 2003. The “Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program for Intercepted Groundwater” (Enclosure A) states that the discharge of intercepted groundwater needs to be evaluated in a manner consistent with the overall objective of “no-salt” return whenever practical. The no-salt discharge requirement may be waived at the option of the permitting authority in those cases in which the discharge salt load reaching the main stem of the Colorado River is less than one ton per day or 350 tons per year, whichever is less.

As cited earlier, the tailings pore water currently migrating from the bottom of the tailings pile has a composition of approximately 24,600 mg/L TDS and a flow rate of 20 gpm. This data indicates that the TDS loading to the Colorado River under the no action alternative is 2.9 tons/day, which clearly exceeds the Colorado River Basin Salinity Control Forum policy on intercepted groundwater. The SOWP indicates that the seepage rate will decline from 20 gpm, at present, to 8 gpm after approximately 20 years. Even so, the TDS loading to the Colorado River will remain above the threshold of one ton/day for the next 20 years under the no action alternative.

For the on-site alternative, the flow rate would decrease to 0.8 gpm, resulting in 0.12 tons/day being discharged to the Colorado River. Although this is less than one ton/day, this loading will increase to greater than one ton/day at 1,094 years from the present, when the pore water impacted by dissolution of salts in the pile enters the groundwater. Metropolitan offers this information to further illustrate that the off-site disposal alternative should be implemented.

Document #553 Comment #10 - continued

Response:

The TDS concentrations characterized by the commentor and in Section 3.1.6.3 are naturally occurring and existed beneath the site prior to milling activities. They are not part of the seepage from the pile. The design of DOE's active ground water remediation program is focused on-site derived contamination and would specifically avoid extraction of this naturally occurring contamination. DOE is currently performing an interim action ground water remediation along the bank of the Colorado River to intercept the contaminant plume with a series of pumping wells before the ground water discharges to the backwater habitat areas. Results from this interim action indicate that the upconing (freshwater intrusion) from the pumping wells is minimal. In addition, the pumping wells have reversed the local ground water flow gradient between the wells and the riverbank such that river water flows to the pumping wells and is captured with the ground water plume. Thus, a pump-and-treat system, if selected for the long-term ground water remediation, would decrease the mass of contaminants discharging to the river.
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Document #553 Comment #11 Commentor: Underwood, Dennis

4. Draft EIS Heightens Need for Off-Site Disposal

Given the drawbacks illustrated in the draft EIS for the no action and on-site alternatives, it is unclear how the DOE can choose any other alternative but off-site disposal. Metropolitan offers the following statements from the Draft EIS to further substantiate our concerns and underscore the need for off-site disposal of the Moab waste pile:

- "Under either the on-site disposal alternative or the No Action alternative, the combination of the processes of subsidence and incision would slowly affect the tailings pile by lowering it in relation to the Colorado River. This impact would not occur under the off-site disposal alternative because the pile would be removed." (Executive Summary, Geology and Soils, Page S−12)

- "Under the on-site disposal alternative, the tailings pile would be a continuing source of contamination that would maintain contaminant concentrations at levels above background concentrations in the groundwater and, therefore, potentially require the application of supplemental standards (institutional standards) in perpetuity to protect human health." (Executive Summary, Ground Water, Page S−13)

- "... [u]nder the No Action alternative, groundwater beneath the Moab site would remain contaminated, would not be protective of human health, and would continue in perpetuity to discharge contamination to the surface water at concentrations that would not be protective of aquatic species. Modeling results indicate that under the on-site disposal alternative, contaminants from the potential salt layer would reach groundwater in approximately 1,100 years and would affect ground water and surface water for approximately 440 years. Because ground water treatment would have been discontinued after an estimated 80 years, surface water concentrations could revert to nonprotective levels." (Executive Summary, Ground Water, Pages S−13 - Page S−14)

- "In addition to natural subsidence described in the discussion of ground water impacts. a Colorado River 100- or 500- year flood could release additional contamination to groundwater and surface water under the on-site disposal or No Action alternatives." (Executive Summary, Surface Water, Page S−14)

- "However, the possibility of a catastrophic flood cannot be eliminated because part of the Moab site tailings impoundment is located within the 100-year floodplain of the Colorado River and within the floodplain of the PMF of both the Colorado River and Moab Wash." (Executive Summary, Table S−1. Consequences of Uncertainty, Item 10. Catastrophic Floods, Page S−41)

Document #553 Comment #11 - continued

- “If river migration and encroachment were to occur to a great degree, significantly lessening the transport distance from the disposal cell to the river, surface water ammonia concentrations and concentrations of other contaminants of concern could revert to nonprotective levels, and additional engineered remedies or pile relocation could be necessary to meet UMTRCA requirements, potentially increasing program costs by tens to hundreds of millions of dollars.” (Executive Summary, Table S−1. Consequences of Uncertainty, Item 9. Catastrophic Floods, Page S−41)

- “However, under the on-site disposal and No Action alternatives, natural basin subsidence would result in permanent tailings contact with the ground water in 7,000 to 10,000 years, at which times surface water concentrations would temporarily revert to levels that are not protective of aquatic species in the Colorado River.” (Draft EIS, Page 2−119)

- “Under the on-site remediation alternative and No Action alternative, a disposal cell or tailings pile failure could pose a risk under the residential scenario and could result in adverse impacts to aquatic receptors from uranium and ammonia concentrations in the Colorado River. The risk would be much lower for the off-site disposal locations because the sites are not located near a river, do not have historical seismic activity, are not prone to subsidence attributed to salt dissolution below the alluvial basin, and are located away from population centers and sensitive habitats.” (Draft EIS, Disposal Cell or Tailings Pile Failure, Page 2−137)

Response:

See response to comment #1.
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Document #553 Comment #12 Commentor: Underwood, Dennis

5. Clean-up Objective for Groundwater Should Protect Public Health as well as Aquatic Life

Metropolitan diverts water from the Colorado River near Parker Dam to supply supplemental drinking water for over 18 million people in Southern California, and protection of water quality is of key importance. Since previous work has confirmed that “groundwater discharge from the Moab site has caused localized degradation of surface water quality (Draft EIS, Page 3−30, Paragraph 6)” and “discharge of contaminated ground water has resulted in elevated concentrations of ammonia and other site-related constituents in the Colorado River adjacent to the site (Executive Summary, Page S−l0, Paragraph 2)”, Metropolitan requests that all constituents found at elevated levels in groundwater be targeted for removal, in order to prevent those constituents from further degrading water quality in the Colorado River. Our review of the groundwater data shows that the maximum groundwater concentrations at the site exceed U.S. Environmental Protection Agency (USEPA) drinking water standards and/or California Title 22 drinking water standards for arsenic, cadmium, fluoride, mercury, nitrate, selenium, thallium, radium 226, radium 228, gross alpha and uranium. Therefore, all of these constituents should be targeted for removal from the groundwater and should have remediation goals.

It is unknown why uranium is not specified like ammonia as a target for treatment, especially when the document itself states “The constituents with concentrations that are most consistently elevated in samples from the Colorado River are ammonia and uranium.” (Draft EIS, Page 3−30, Paragraph 7)

In addition, it is premature to focus solely on ammonia as a constituent of concern, as changing the oxidation-reduction potential content in the pile may also change the chemical composition of the pore fluid of the tailings pile and subsequently the potential impacts to the Colorado River. The oxidation-reduction potential of the tailings does not appear to have been adequately characterized, as indicators of both oxidizing and reducing environments in the tailings pile have been presented in the SOWP. For example, the SOWP states “Dissolved oxygen concentrations in the pore water samples range from 0.82 to 6.7 mg/L with a mean of 2.1 mg/L, suggesting relatively oxidized conditions. In a few samples, dissolved Fe and Mn concentrations of up to 211 mg/L and 64.8 mg/L, respectively, suggest reducing conditions.” (SOWP, Page 5−61)

The data presented pertaining to the oxidized state of the tailings is inconclusive, and therefore the potential for metals to leach into the subsurface through the pore fluids of the tailings as the tailings undergo oxidation or reduction has not been adequately assessed. Metropolitan requests that this issue be adequately addressed in the Final EIS.

Response:

Although no EPA drinking water or ground water standard exists for ammonia, it was selected for modeling because it is present in the tailings seepage and ground water at concentrations significantly greater than natural background. Also, ammonia is the key constituent driving the proposed ground water remedial action presented in the EIS because of its high concentrations discharging to the Colorado River and its toxicity to aquatic organisms. It is assumed that if ammonia target goals could be achieved that are acceptable for protection of aquatic life, concentrations of the other contaminants would also be protective. Even though the geochemical

Document #553 Comment #12 - response continued

behavior of the other constituents differs from that of ammonia, it is anticipated that these constituents would be protective in the same time frame that it would take for ammonia to reach protective levels because they are less elevated above applicable cleanup criteria (e.g., surface water standards), are less widespread, or occur at elevated concentrations less frequently. Section 2.3.1 of the EIS provides further explanation.

DOE is proposing to remediate ground water under EPA regulations in 40 CFR 192. Regardless of whether surface remediation involved on-site or off-site disposal, active remediation is proposed for contamination remaining in ground water beneath the Moab site to control the degradation of surface water quality. This active remediation would be conducted in conjunction with the application of supplemental standards provided under 40 CFR 192.

Only those water samples from locations adjacent to the sites, which have been cut off from the main flow of the river, have significantly elevated ammonia concentrations. Samples collected in the main river channel show no or minimal impact, indicating that discharge of site-related ground water is not degrading the overall water quality of the river. Concentrations decrease to natural background levels within 0.5 mile downstream from the site. Section 3.1.7.3 has been revised to clarify that only localized effects on surface water would occur.
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Document #553 Comment #13 Commentor: Underwood, Dennis

6. Effectiveness of Proposed Remediation Scheme is Unknown and Unpredictable

Metropolitan is concerned with the effectiveness and impacts of the groundwater remediation system on the Colorado River, as insufficient information was provided on the selection and design of the extraction and treatment system. Also, Metropolitan disagrees with the presumption that the proposed groundwater remediation designed to achieve an ammonia groundwater concentration of 3 mg/L “...would also clean up other contaminants to their appropriate and respective clean-up levels.” (Executive Summary, Table S−1. Consequences of Uncertainty, Item 15. Other Contaminants of Concern, Page S−43)

This assumption is erroneous, as removal efficiencies will vary, depending on the target contaminant and the remediation technology selected. In fact, “...DOE acknowledges that there is uncertainty in this assumption due to factors such as differences in solute transport and sorption mechanics.” (Executive Summary Table S−1. Consequences of Uncertainty, Item l5. Other Contaminants of Concern, Page S−43)

To address these uncertainties, the appropriate treatment technologies should be selected at the onset to target ammonia as well as all other identified contaminants of concern. The appropriate treatment technologies selected for the on-site alternative should be identified in the Final EIS.

Response:

As stated in the EIS (Section 2.3.2.1), additional testing, characterization, or pilot studies may be required before the optimum treatment technology could be selected and designed. This level of design would be developed after DOE issues its Record of Decision. Section 9 of the SOWP presents more detailed descriptions of treatment options.
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Document #553 Comment #14 Commentor: Dennis Underwood

7. Groundwater Remediation Options Need to be Carefully Weighed

Metropolitan also has the following specific concerns related to the groundwater remediation options:

- If water is returned to the Colorado River, the water quality discharged to the Colorado River should be equal to or better than upstream ambient concentrations in the Colorado River.

Response:

DOE acknowledges that ground water remediation options need to be carefully weighed and evaluated as part of the selection of the final treatment technology. As stated in the EIS (Section 2.3.2.1), additional testing, characterization, or pilot studies may be required before the optimum treatment technology could be selected and designed. This level of design would be developed in a remedial action plan (described in Section 2.3.1 of the EIS) after the Record of Decision is issued. Section 9 of the SOWP presents more detailed descriptions of treatment options.
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Document #553 Comment #15 Commentor: Dennis Underwood

If water is returned to the Colorado River, the Colorado River Basin Salinity Control Forum's "Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program" should be met (Enclosure B).

Response:

See response to comment #14.
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Document #553 Comment #16 Commentor: Dennis Underwood

Metropolitan opposes the clean water application, as this approach relies on dilution as a solution for elevated concentration rather than removing contamination before it enters the Colorado River. The clean water application may address reducing the concentration of contaminants in the discharge, but it does not reduce the total load of contaminants to the Colorado River.

Response:

The clean water application (Section 2.3.1.4) would be a temporary interim measure to be used to reduce or eliminate localized habitat impacts during the overall ground water remediation program. This measure has been accepted by the USF&WS as a best management practice in the Biological Opinion (Appendix A3 of the EIS). It would not be a substitute for the preferred active ground water remediation alternative.
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Document #553 Comment #17 Commentor: Dennis Underwood

Metropolitan is concerned with placing large, solar evaporation ponds in the floodplain area as these ponds are vulnerable to flooding events, which may then transport contamination concentrated in the ponded water to the Colorado River.

Response:

DOE is not proposing to locate an evaporation pond in the floodplain for ground water remediation. Additionally, Sections 2.3.2 and F2.1.2 of the EIS indicate that berms would be constructed to heights that exceed the river level of a 100-year flood. Evaporation pond location would consider potential flooding, and mitigation, in the remedial action plan following the Record of Decision.

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Document #553 Comment #18 Commentor: Dennis Underwood

Metropolitan is concerned with on-site drying of tailings, as this would have the "...potential for tailings to be transported off-site and into the Colorado River and Moab Wash (Draft EIS, Page 4−12, Paragraph 4) if a flood with greater than a 25-year return interval should occur."

Response:

Section 4.2.4.1 in the EIS has been expanded to reflect that the greater flow velocities associated with a flood through Moab Wash would have a greater ability to transport contaminants from the site to the Colorado River. However, the minimal amount of contaminants that could become suspended or dissolved into Colorado River or Moab Wash floodwaters during either on-site or off-site disposal operations (for example, drying tailings) would be dispersed and diluted in the floodwaters such that there would be no significant contamination in off-site sediment or river water.

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Document #553 Comment #19 Commentor: Dennis Underwood

Metropolitan is concerned that a pump-and-treat system may cause added contamination to the Colorado River. According to the SOWP, “freshwater in the unconfined alluvial system at the Moab site is underlain by a brine zone. Pumping from the shallow fresher water system (during; pump-and-treat remediation) may cause the salt-water to rise to a higher elevation and intrude the fresher water. Salt-water intrusion would result in degradation of the overlying fresher water, which could adversely affect the tamarisk plant communities that are providing beneficial phytoremediation at the site. Besides causing saltwater intrusion into the shallow ground water, rising salt water may bring higher ammonia concentrations to the surface and cause added contamination to the river.” Therefore, impacts from groundwater pumping should be addressed in the final EIS.

Response:

DOE is currently performing an interim action ground water remediation along the bank of the Colorado River to intercept the contaminant plume with a series of pumping wells before the ground water discharges to the backwater habitat areas. Results from this interim action indicate that the upconing (freshwater intrusion) from the pumping wells is minimal. In addition, the pumping wells have reversed the local ground water flow gradient between the wells and the riverbank such that river water flows to the pumping wells and is captured with the ground water plume. Thus, a pump-and-treat system, if selected for the long-term ground water remediation, would decrease contaminant mass discharging to the river. DOE acknowledges these concerns, and they would be evaluated and mitigated as part of the selection of the final treatment technology. As stated in the EIS (Section 2.3.2.1), additional testing, characterization, or pilot studies may be required before the optimum treatment technology could be selected and designed. This level of design would be developed in the remedial action plan (described in Section 2.3.1 of the EIS), after the Record of Decision is issued. Section 9 of the SOWP presents more detailed descriptions of treatment options.

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Document #555 Comment #1 Commentor: Hedden, Bill—Grand Canyon Trust

The Grand Canyon Trust and other conservation groups listed at the end of these remarks appreciate the opportunity to submit comments on the Draft EIS Remediation of the Moab Uranium Mill Tailings. It is our position that the Klondike Flats or Crescent Junction offsite alternatives offer the best balance of long-term isolation of the wastes at reasonable cost. Onsite stabilization is fraught with many uncertainties regarding critical issues that could result in impoundment failure and release of contaminants into the City of Moab and the Colorado River, as well as the virtual certainty that ground and surface water treatment under this alternative will be much less successful than if the tailings were removed.

Response:

The uncertainties associated with all the alternatives are identified in Section 2.6 of the EIS. This section also identifies the uncertainties associated with ground water treatment for all alternatives. The commentor's assessment of the relative success of ground water remediation under the on-site disposal alternative is not consistent with that presented in the EIS (Sections 4.1 and 4.2), which indicates that both the on-site and off-site alternatives could be protective.
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Document #555 Comment #2 Commentor: Hedden, Bill

We also find that the analysis of socioeconomics completely ignores the likely consequences of tailings pile failure for the local and regional economies, despite the fact that these costs could easily dwarf the entire cost of tailings reclamation under any scenario.

Response:

Although DOE cannot determine a plausible mechanism for catastrophic failure of an on-site disposal cell, the environmental consequences of such a failure are characterized in Section 4.1.17. Because this is a highly unlikely event, the costs of remediating a catastrophic failure have not been estimated.
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Document #555 Comment #3 Commentor: Hedden, Bill

Importance of the Colorado River

In our view, a central shortcoming of the DEIS is its consistent failure to recognize the overriding importance of two primary issues. The first is the extraordinary importance of the Colorado River to the natural systems and human societies of the Southwestern U.S. No other resource except air is more critical to this region. Every drop of the river is already appropriated for human use, as drinking water for 26 million people and irrigation for some of the country's most high value food crops. The region served by the river is the nation's fastest growing area, so allocation of this scarce water source will almost certainly become an even more dominant theme of western society over the coming decades and centuries.

Response:

DOE acknowledges the commentor's concern regarding the importance and use of the Colorado River as a downstream water supply. DOE is proposing to remediate the Moab site pursuant to applicable law and regulatory requirements. DOE has summarized the potential impacts from remediating the Moab site (Table 2−32 of the EIS). DOE will consider the analyses in the EIS together will all comments on the draft EIS in selecting the disposal site and method in the Record of Decision.

Regardless of whether, in the Record of Decision, DOE ultimately decides to relocate the tailings pile or cap it in place, DOE is confident that the disposal cell would effectively contain mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements in 40 CFR 192.

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Document #555 Comment #4 Commentor: Hedden, Bill

One hundred years ago the Colorado flowed free into the Gulf of California. In the intervening time, more money has been spent per gallon putting this river to use for human benefit than any other sizeable river on earth. Trying to predict use of the river over the coming millennium reveals the limits of imagination, but the only responsible course is to assume that the water will be incredibly precious. None of these matters is discussed in the DEIS, despite the massive and ongoing contamination of the river by tailings discharge, and the threat of catastrophic tailings pile failure.

Document #555 Comment #4 - continued

Response:

DOE agrees that Colorado River water is a precious resource and that it likely will become increasingly precious. DOE is confident that any of the proposed actions described in the EIS would provide long-term protection of human health and the environment. The final decision on which alternative will ultimately be selected and implemented will be announced in the Record of Decision, which DOE expects to issue in late 2005. As detailed in the EIS, the risk of catastrophic disposal cell failure under the on-site disposal alternative is highly unlikely during the regulatory time period of 200 to 1,000 years.
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Document #555 Comment #5 Commentor: Hedden, Bill

Never looking into the future, DOE always proceeds as though there is no significant human use of the river in the vicinity and resolutely defines the issue as simply the protection of aquatic organisms and river runners in the vicinity near the tailings pile. This failure is so important that it nearly invalidates the entire DEIS as a decision-support tool. On page 4−56, there is a matter-of-fact discussion of scenarios in which radioactive wastes and other toxins might be spread throughout the river and riparian zone for a hundred miles, concluding, “A major tailings release is not anticipated to significantly increase risks to human populations downstream of Lake Powell.” That is the extent of analysis for a disaster that could turn life in three states and part of Mexico upside down, and that would carry a staggering price tag.

Response:

The catastrophic failure analyses (Section 4.1.17) were done as a screening tool to inform decision-makers of the possible differences among the on-site and off-site disposal alternatives, even though DOE believes that there are no plausible mechanisms for such a failure.

Based on these analyses, the short-term impacts at Lake Powell would be expected to be limited; in the long term, degradation of contaminants such as ammonia and further sedimentation would further reduce risks. Risks downstream of Lake Powell would be even lower and likely not discernible above background.
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Document #555 Comment #6 Commentor: Hedden, Bill

As we will point out in these comments, this conceptual failure resonates throughout the DEIS, biasing many of the risk analyses, rendering the ground and surface water treatment plans inadequate, and leading to the wrong conclusions about the consequences of possible tailings pile failure. This is why the governors of Utah, New Mexico, Arizona, Nevada and California wrote DOE on 12/29/04 saying, “We want to make it clear that any remediation other than an off-site option is unacceptable.” Similarly, on February 9, 2005, the entire Utah congressional delegation wrote Secretary Bodman to say, “We believe the only appropriate action is to move the tailings pile from the banks of the river.” We agree.

Document #555 Comment #6 - continued

Response:

DOE believes that the analyses in the EIS are adequate to support informed decision-making and will consider the commentor's views in its decision-making process.
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Document #555 Comment #7 Commentor: Hedden, Bill

Failure to Adequately Plan for the Long Term

The second outstanding issue given short shrift in the DEIS is the necessity of preparing a reclamation plan that will truly isolate the wastes over the long term. The National Academies' Board on Radioactive Waste Management points out in its Report to DOE that "the tailings represent a hazard that essentially lasts forever." They go on to say,

"DOE should…recognize that there is no physical basis for a line to be drawn at 1,000 years; indeed…the hazards to humans and ecosystems from the mill tailings will last far longer than any period of regulatory compliance."

Throughout the DEIS are references to the EPA standard at 40 CFR 192.02 (a) that control of mill tailings shall be designed to "Be effective for up to one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years." This was written in recognition of the fact that radioactivity in the tailings will have declined by less than 1% after a millennium. The Klondike and Crescent Junction offsite alternatives offer excellent prospects of complying with the letter and spirit of this standard. But, for the onsite alternative, when the DEIS evaluates the durability of structures proposed to be built directly in the path of powerful floods, this standard seems to have been interpreted to mean, "We hope they might last for as long as 200 years," and when considering a fully expected gush of concentrated contaminants to the river, "Don't worry, it won't happen until 1,100 years out." These games with numbers are completely unacceptable when the water supply for the Southwest is at stake. Uncertainties with such serious consequences must be resolved through extreme caution, and that is systematically lacking in the DEIS with regard to the long term stability of onsite reclamation.

Response:

The analyses in the EIS demonstrate that all alternatives except the No Action alternative would be able to meet the established performance requirements. Uncertainties in the analyses and differing opinions are reflected in Sections 2.6.3 and 2.6.4, respectively. The EIS also demonstrates the differences among the alternatives with regard to short-term and long-term performance; DOE will consider these factors in its final decision-making.
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Document #555 Comment #8 Commentor: Hedden, Bill

The Requirement to Minimize Maintenance

This point is reinforced by consideration of a rarely mentioned section of the EPA standard at 40 CFR 192.02 (d), which says, in its entirety, "Each site on which disposal occurs shall be designed and stabilized in a manner that minimizes the need for future maintenance." What this standard really requires is a tailings impoundment so robust and stable that it will still be going strong at 1,000 years, with good prospects of lasting far longer.

That is likely unachievable with onsite reclamation at the difficult Moab site, as the DEIS makes clear. On page 2−176 DOE explains that it does not believe issues like river migration need to be resolved before making a reclamation decision, because continuous monitoring will allow for remedial actions in the future if assumptions turn out to be wrong. Yet, on page 2−171 is a discussion describing the ways migration of the river could increase contaminant levels and require expenditures for riprap walls and other remedies up to tens or hundreds of millions of dollars. At the extreme, the DEIS says, perpetual treatment or mitigation might be required, or the tailings would have to be relocated after all onsite costs and efforts had been committed. This potential disaster illustrates why DOE's regulatory guidance mandates selection of a reclamation alternative that calls for minimum maintenance.

Response:

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192 and that under either the on-site or off-site disposal alternatives, the minimum maintenance standard at 40 CFR 192.02(d) would also be achieved.

There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these opposing views (Section 2.6.4). If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the already low probability of a catastrophic failure of the disposal cell should river migration toward the pile begin to occur unexpectedly. The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials would be sized to withstand the maximum river forces recently identified by USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment. The final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan if the on-site alternative were selected. The estimated cost range for remediation (shown in Table 2−33, item #9) would accommodate materials consistent with the recent USGS report.

Document #555 Comment #8 - response continued

The commentor correctly characterizes the possibility of perpetual treatment or of having to pay to relocate the pile after the on-site disposal alternative had been implemented as "at the extreme." DOE included these possibilities as worst-case financial consequences of river migration uncertainty in Table 2−33, item #9. The NEPA process requires DOE to evaluate all reasonable alternatives, which include both on-site and off-site disposal. Maintenance requirements are one of many factors that will be evaluated and compared when DOE selects the disposal site and method in the Record of Decision.
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Document #555 Comment #9 Commentor: Hedden, Bill

This minimum maintenance standard has the same preeminent weight in law as the 200-1,000 year timeframe, the requirement to control radon releases, and the requirement to protect groundwater, yet DOE does not quote it in the DEIS, nor give much priority to its dictate, because that requirement argues so heavily against capping the tailings on wet alluvium in the floodplain of a famously unpredictable river. As with underestimating the importance of the Colorado River, these comments will show that the DEIS is compromised in many places by the failure to truly envision and plan for what the river might do over a thousand years, or to imagine changes at the Moab site and in society during that time. These fundamental failures and all the errors arising from them must be corrected in the FEIS in order to allow selection of the best Preferred Alternative.

Response:

DOE agrees with the commentor that each of the four standards cited in 40 CFR 192.02 (effectiveness period, limitations on radon-222 release, ground water protection, and minimum maintenance) are of equal regulatory concern. Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively meet each of these standards. Although 40 CFR 192(d) is not specifically cited in the EIS, DOE believes that the design and construction of an on-site or off-site disposal cell would comply and conform with the minimum maintenance standards.
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Document #555 Comment #10 Commentor: Hedden, Bill

Regulatory Requirements

42 USC 7912 (f) (3) Ignored

Section 1.1 of the DEIS, which recounts the regulatory history of DOE's involvement with the Moab site, arbitrarily omits a key provision of law. Page 1−31 of the DEIS says that the Floyd Spence Act requires that "DOE prepare a remediation plan to evaluate the costs, benefits, and risks associated with various remediation alternatives." This is presented as the primary legal driver behind the entire DEIS. However, the Floyd Spence Act contains an even more specific provision regarding the Moab site, one that was the centerpiece of the legislation long before the last minute addition of the language DOE quotes in the DEIS. This provision is codified at 42 USC 7912 (f) (3):

Remediation—Subject to the availability of appropriations for this purpose, the Secretary shall conduct remediation at the Moab site in a safe and environmentally sound manner that takes into consideration the remedial action plan prepared pursuant to section 3405 (i) of the Strom Thurmond National Defense Authorization Act for fiscal Year 1999 (10 U.S.C. 7420 note; Public Law 105-261), including—

(A) ground water restoration; and

(B) the removal, to a site in the State of Utah, for permanent disposition and any necessary stabilization, of residual radioactive material and other contaminated material from the Moab site and the floodplain of the Colorado River. (emphasis added)

Legislators intended this language to result in removal of the mill wastes from the flood plain of the river. Utah Senator Bob Bennett said, upon passage of the bill, "Bottom line; the tailings will be moved" (personal communication). California Congressman George Miller, who also played a leading role in writing and supporting the legislation, said, "The tailings will be moved" (personal communication).

The intent of this language is entirely consistent with DOE practice throughout the UMTRA program. Every tailings pile located beside a river (with the exception of the Shiprock site, which is on a high bluff) was removed to a safer location, despite the fact that DOE had no such specific legislative guidance regarding sites other than Moab. Moreover, the Moab site is far larger than any of the other tailings piles, and is more polluting to the river than all of the other sites combined. It is also threatened by the largest, wildest river, since the Gunnison and Dolores rivers and numerous streams have added their flows to the Colorado between the Grand Junction site and the Moab site. DOE must explain in the FEIS how it is interpreting its own regulations to reach this point where the biggest, most polluting and most threatened tailings pile may be the only one left beside a river, despite the fact that this site also has the most specific legislative mandate to be removed. Failure to so explain will render any onsite disposal decision arbitrary and capricious in the extreme.

Document #555 Comment #10 - continued

Response:

As stated in the Federal Register (December 20, 2002), this EIS replaces the Plan for Remediation identified in the Floyd D. Spence National Defense Authorization Act for FY 2001. The Floyd D. Spence Act also states "The Secretary of Energy shall enter into arrangements with the National Academy of Sciences to obtain the technical advice, assistance, and recommendations of the National Academy of Sciences in objectively evaluating the costs, benefits, and risks associated with *various remediation alternatives, including* removal or treatment of radioactive or other hazardous materials at the site…" [emphasis added]. Consequently, DOE has complied with the Floyd D. Spence Act by evaluating various remediation alternatives, including both on-site and off-site disposal.

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Document #555 Comment #11 Commentor: Hedden, Bill

Groundwater Remediation

Inappropriate Application of Supplemental Standards

An essential part of the DEIS is DOE's assertion that the groundwater compliance strategy will be almost independent of the decision about where and how to reclaim the tailings pile. Whether the 11.9 million tons of tailings and their 21.6 million cubic feet of highly contaminated pore water are left in place seeping into the groundwater or completely removed is considered to have no effect on the appropriate plans for cleanup.

The DEIS does not come close to explaining the credibility of this counter-intuitive conclusion. However, central to the logic is an unacceptable partitioning of the ground water from the surface water to which it is hydraulically connected right at the site boundary. DOE has decided to authorize itself to apply Supplemental Standards because the aquifer under the pile qualifies as "limited-use groundwater" due to its high TDS content, despite the fact that this aquifer, and the millsite contaminants in it, discharge directly into the water supply for 26 million people at the site boundary at levels far exceeding standards for many regulated substances (page 1−39 and following; 2−90 and following). Arsenic, cadmium, molybdenum, nitrate, radium, selenium, uranium and gross alpha exceed 40 CFR 192 maximum concentration limits, and ammonia and sulfate exceed risk-based concentrations. It is unacceptable to assert, as the DEIS does on page 1−40, 2−90, and elsewhere, that discharge of such groundwater to the Colorado River "pose(s) no risk to humans."

Response:

DOE based its decision regarding the application and appropriateness of supplemental standards on 40 CFR 192.2(g). Because of its naturally high salt content, the uppermost aquifer at the Moab site does not represent a potential source of drinking water. However, discharge of contaminated ground water has resulted in elevated concentrations of ammonia, copper, manganese, sulfate, and uranium in a portion of the Colorado River near the Moab site. These concentrations pose no risk to humans, but ammonia concentrations exceed levels considered to be protective of aquatic life. Therefore, the cleanup objective of the proposed ground water action is to protect the environment, particularly endangered species of fish that are known to use that portion of the river. Active ground water remediation would be necessary to meet this goal, regardless of whether the on-site or off-site disposal alternative were selected.

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Document #555 Comment #12 Commentor: Hedden, Bill

Humans use all the water in the Colorado River, and there is no safe minimum dose of uranium. After a millennium, our descendents may be reverently lifting water out of this river in thimbles. Moreover, within decades, the City of Moab will likely be much larger and drawing drinking water directly from the river. The conclusion that people will not be affected by poisoning the river is one of the pernicious results of the failure to place adequate weight on the importance of the Colorado River to the human communities of the Southwest, or to clearly envision changes over the long regulatory time periods. Instead of this compliance strategy that simply defines away risks to humans, DOE must lay out a plan for permanently removing the mill related contaminants from the groundwater before they reach the river. If it is more expensive and complex to do this with the tailings in place, then that is a major strike against that option.

Response:

DOE acknowledges the commentor's concern regarding uncertainties in future water use in the Southwest, especially over the long regulatory time period.

Regardless of whether, in the Record of Decision, DOE ultimately decides to relocate the tailings pile or cap it in place, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements in 40 CFR 192.

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Document #555 Comment #13 Commentor: Hedden, Bill

Finally, Dr. Kip Solomon's work has shown that the Colorado is probably not a complete barrier to the passage of contaminated groundwater across to the Moab side of the river. Elevated uranium concentrations are found in groundwater beneath the Matheson Wetland Preserve in a pattern that suggests subsurface transfer beneath the river. This is another pathway for the tailings contaminants to affect human receptors. The DEIS acknowledges this on page 2−172, where it says that the under-river flow could prohibit achieving protective surface water criteria, a situation that could result in perpetual groundwater remedial action. Uncertainties of this sort, that could involve huge costs and human health risks, should be written in large red letters in the FEIS. Essentially all the many uncertainties of this nature are about the onsite alternative. The offsite alternatives are much more nearly certain to result in long term isolation of the wastes without the need for maintenance. The FEIS should group all these potentially catastrophic uncertainties together in one chart and highlight which alternatives they apply to.

Response:

DOE's position is that contamination is not migrating under the river and affecting the Matheson Wetlands Preserve. However, there are responsible opposing views on the fate and transport of site-derived contaminants in ground water. These opposing views are discussed in Section 2.6.4 of the EIS.

DOE agrees that there are numerous uncertainties and assumptions, including long-term ones, that could potentially increase the duration of remedial action under the on-site disposal alternative and could therefore increase the lifetime cost of the on-site disposal alternative. In the EIS, DOE has described each recognized area of uncertainty and the potential consequences, including cost, where applicable (see Tables S−1 and 2−33 of the EIS).

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Document #555 Comment #14 Commentor: Hedden, Bill

Groundwater Standards as Promulgated Already Reflect Cost/Benefit Analysis

The DEIS does not consider the fact that the groundwater standards were originally promulgated after careful weighing of costs and benefits. It is inappropriate to perform another round of cost/benefit analysis when determining if standards can be met onsite. For example, in the January 11, 1995 Federal Register Notice through which EPA announced the "Final Rule Regarding Groundwater Standards for Remedial Actions at Inactive Uranium Processing Sites," the Administrator includes a section titled "Costs," which states,

"In 1983, Congress amended UMTRCA to provide that when establishing standards the Administrator should consider, among other factors, the economic costs of compliance. We have considered these costs in two ways. First, we compared them to the benefit, expressed in terms of the value of the product--processed uranium ore--which has led to contamination of groundwater at these sites. We estimate the present value of the processed uranium ore from these sites as approximately 3.9 billion dollars (1989 dollars). The estimated cost of compliance is approximately 5.512% this value, and we judge this to be a not unreasonable incremental cost for the remediation of contamination from the operations which produced this uranium. As a second way of considering the economic costs of compliance, we examined the cost of alternative ways to supply the resources for future use represented by these groundwaters. As noted earlier, water is a scarce resource in the Western States where this cleanup would occur. When other resources have been exhausted, the only remaining alternative to cleaning up groundwater in the vicinity of these sites is to replace this water by transporting water from the nearest alternative source. Our analysis of the costs of doing this indicates that it is significantly more costly to supply water from alternative sources than it would be to clean up the groundwater at these sites. We have concluded, therefore, that this final rule involves a reasonable relationship between the overall costs and benefits of compliance."

When DOE proposes in the DEIS to accept levels of contamination of ground water far higher than EPA standards, this decision must not be based on cost considerations that have already been factored into the standards.

Response:

DOE is not proposing to accept levels of site-derived contaminated ground water higher than are allowed under EPA standards. As established in Section 2.3, because the uppermost aquifer is predominantly composed of naturally occurring brine, it meets EPA's criteria in 40 CFR 192 for limited-use ground water.

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Document #555 Comment #15 Commentor: Hedden, Bill

One Groundwater Compliance Strategy, Very Different Results

On the other hand, the proposed groundwater compliance strategy may simply be the only technically feasible plan due to the difficult constraints of the site. Among other things, the tailings pile itself blocks access to much of the contaminated groundwater, over-pumping the groundwater will bring highly saline water to the surface, and all wells, pipelines, trenches and treatment facilities installed between the pile and the river will be subject to damage or destruction from periodic flooding.

If this is the only achievable plan, rather than the best plan, DOE must acknowledge these limitations and prepare to do everything it can to minimize further contamination of the groundwater and hydraulically connected surface water that provides critical wildlife habitat and irreplaceable drinking water. And it is in this regard that the offsite alternatives, which remove the source of contamination and result in permanent cleansing of the aquifer, have enormous benefits over the onsite alternative.

The difference in expected performance of the groundwater compliance strategy under different remediation alternatives is partially expressed on page 2−109:

"Because seepage from the tailings pile represents a long term source of groundwater loading, an onsite disposal decision could result in longer term ground water remediation; higher concentrations of residual groundwater contamination would also be expected to remain at the conclusion of the remediation time period (see Figure 2−43). The longer operational time period would also result in a corresponding increase in operational costs of the system. Uncertainties associated with model predictions for the onsite disposal alternative involve both the time to meet steady state conditions and the question of whether the target goals could be met."

Response:

DOE believes that the ground water remediation proposed for the Moab site would meet regulatory requirements using currently available technology. DOE agrees that there are numerous uncertainties and assumptions, including long-term ones, that could potentially affect performance of the ground water compliance strategy under different surface remediation alternatives. In the EIS, DOE has described each recognized area of uncertainty and the potential consequences. In addition, in the final EIS DOE has added a new section (Section 2.6.4) that addresses specific areas of uncertainty about which there are responsible opposing views.
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Document #555 Comment #16 Commentor: Hedden, Bill

The issue of whether target goals can ever be met if the tailings are left in place is another of the red letter uncertainties that should play a central role in selection of an alternative. The choice is a stark one. Today, the tailings pile is leaking an estimated 28,800 gallons per day of pore water with mean concentrations of 61 pCi/l of radium-226 (12x the MCL), 15.6 mg/l uranium (355x the MCL), and 1,100 mg/l ammonia (366x the acute lethal dose for fish) into the groundwater (DESI page 3−11). This toxic seepage would be completely stopped and replaced with flushing rainwater within 10 years under the offsite alternatives, but will continue forever with onsite remediation.

Response:

DOE agrees that there are numerous uncertainties and assumptions, including the applicable compliance standard and, by extension, the appropriate ground water cleanup goals, that could potentially increase the duration of remedial action under the on-site disposal alternative and could therefore increase the lifetime cost of the on-site disposal alternative. In the EIS, DOE has described each recognized area of uncertainty and the potential consequences, including cost, where applicable (see Tables S−1 and 2−33 of the EIS). In addition, in the final EIS DOE has added a new section (Section 2.6.4) that addresses specific areas of uncertainty about which there are responsible opposing views.

Although the commentor correctly summarizes the characteristics of the current leachate, the commentor's comparison of the results of on-site and off-site remediation is incorrect. Under either the on-site or off-site disposal alternative, contaminated leachate would be intercepted, collected, and treated. DOE believes that any of the proposed actions described in the EIS would provide long-term protection of human health and the environment.

While acknowledging the comments, and while granting that they factored significantly into DOE's process of identifying its preferred alternative, DOE disagrees with the underlying premise that the on-site disposal alternative would not provide protection to human health and the environment commensurate with the requirements of 40 CFR 192. DOE believes that the final disposal cell design, which would be developed in a remedial action plan (to be issued following the Record of Decision), would meet the requirements in 40 CFR 192 and would receive full review and concurrence from the NRC, regardless of whether the on-site disposal alternative or one of the three off-site disposal alternatives were selected.
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Document #555 Comment #17 Commentor: Hedden, Bill

At page 4−7 the DEIS says that the cap is expected to reduce infiltration, from the current rate of 20 gpm to 0.8 gpm, 130 years after installation of a 5×10^{-8} cm/second cap (the tightest yet built), but the National Academies Committee warns in its report to DOE that tailings caps routinely become two orders of magnitude more permeable over time, so influx rates may well be higher than those modeled. The increasing leakiness of the cap over time is not analyzed in the DEIS.

This is another critical uncertainty, as shown in Figure 2−43. Somehow, DOE predicts identical reductions in groundwater ammonia over 75−80 years, whether the tailings and their seepage are left in place or removed, but thereafter concentrations plunge quickly and permanently to near zero in the offsite scenario while hovering close to the acute lethal dose essentially forever under the onsite scenario. Small errors in estimating either the seepage rates or the concentrations of contaminants could result in never reaching groundwater targets, yet Table 2−33 shows that ammonia concentrations could be ten times as high as predicted. If true, onsite remediation will never achieve groundwater goals and remediation will continue indefinitely. DOE must revise this entire section in the FEIS to show that the groundwater treatment results are not at all equivalent depending on the reclamation option chosen.

Response:

Based on technical literature (Howell and Shackelford 1997; Estronell and Daniel 1992) and experience with other cover designs (Albright et al. 2004), DOE has a reasonable assurance that a cover can be successfully constructed with saturated hydraulic conductivity values that meet the ground water protection strategy requirements (1×10^{-8} cm/s). Further, it is explicitly contemplated in UMTRCA that long-term stewardship, including monitoring and maintenance of the institutional and engineering controls, would be applied to the site to ensure long-term performance and protection of public health and the environment. However, under the on-site disposal alternative, the infiltration rate is greatly reduced when the cover is placed on the tailings, which would limit, but not eliminate, the amount of leachate into the ground water. Details and assumptions used in the flow and transport modeling are presented in Section 7 of the SOWP. The consequences of the uncertainties of cover performance are discussed in Tables S−1 and 2−33 of the EIS.

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Document #555 Comment #18 Commentor: Hedden, Bill

Long Term Performance of the Groundwater Compliance Strategy

The discussion of the long term performance of the groundwater strategy fails to consider the effects of periodic flooding on the infrastructure that must be built in the floodplain of the river. Page 2−99 tells us to expect 50−150 extraction wells and/or 2,000 feet of shallow trenches in this flood prone area, and page 2−104 goes on to describe the need for emission controls, holding tanks, water lines, electrical lines, chemical storage areas, and pumps. All of this $10 million investment must be expected to withstand a 100-year flood with its fast moving driftwood logs, erosion and mud. Again, this is why the alternatives that actually reach acceptable goals through natural flushing are far better than those requiring a lot of technology and maintenance. A discussion of these problems is necessary in the FEIS.

These expected river floods have another effect on the performance of the groundwater treatment system. Page 4−10 reveals that simulations of the 1984 flood of 70,000 CFS show that this river stage will add 4.4 million gallons of water to the tailings, which then will drain at 307 gpm (more than 15 times the current rate) for ten days. This is expected to raise groundwater ammonia concentrations by 2 mg/l (66% of the acute lethal dose for fish) over ten years. However, the document trivializes this result and the sure prospect for future repeats by saying, “However, the effects of a tailings inundation would decline rapidly over a period of approximately 20 years after the flood event.” Here again, the DEIS has lost sight of the unacceptability of contaminating the Colorado River for decades. What aggravated contamination will result from a repeat of the 1884 flood, estimated at 125,000 CFS? How about the 500-year flood, or the Probable Maximum Flood (PMF), which will flood the pile to a depth of 25 feet? The FEIS must discuss these floods with a proper appreciation of their inevitability and their effects on renewed contamination if the tailings are reclaimed onsite. Somehow, the selection of a preferred alternative must focus on the common sense of remarks in the DEIS like the one on page 2−120, which says, “In contrast to the onsite disposal and No Action alternatives, the offsite disposal alternative presents no risk of these recurrences of surface water contamination at the Moab site because the tailings pile will be removed.”

Response:

The commentor is correct that a flood drainage rate could be approximately 15 times the current rate. Technical details regarding DOE’s analysis are provided in the SOWP (Section 7.5.4). A very simplified analysis was performed in the SOWP as a screening step to evaluate the potential magnitude of a significant ground water rise caused by flooding in the Colorado River to determine if additional analysis would be warranted. Because the analysis was a worst-case scenario and the ammonia concentrations were predicted to only slightly exceed 2 mg/L at the river, no additional analysis was deemed necessary. Results of the simplified analysis probably overestimate the 2-mg/L ammonia concentration by one to two orders of magnitude for two reasons: (1) the actual drainage rate for a capped pile would be much less than the 307 gpm, and (2) the ammonia concentrations in the seepage water would be much less than the assumed 1,100 mg/L. The actual drainage rate is overestimated because the analysis does not account for the low permeability of the sides of the pile (which would be protected by a 1×10^{-8} cm/s clay layer) and the low permeability of the dense basal layer of the tailings. These low permeabilities would limit the volume of water into the pile. The analysis also conservatively assumes that the

Document #555 Comment #18 - response continued

entire volume of water would equilibrate instantaneously to 1,100-mg/L ammonia while in contact with the tailings before draining. Therefore, it is highly unlikely that the ammonia concentrations would approach 2 mg/L at the river. The discussion of the ground water remediation alternative in the EIS is sufficient for comparison of alternatives. The commentor's concerns regarding the effects of periodic flooding on the performance of the ground water treatment system are noted and will be considered during design of the long-term ground water treatment system, which will be developed after the Record of Decision.

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Document #555 Comment #19 Commentor: Hedden, Bill

The third significant long term problem with groundwater treatment under the onsite alternative involves the probable presence of an ammonia salt layer in the upper part of the pile. Ammonia in this layer of the tailings is concentrated to 18,000 mg/l, and this extremely toxic pore water is expected to sink down, eventually reaching the groundwater in 1,100 years. This will result in resumption of non-protective surface water quality for an estimated 440 years (DEIS page 2−114). It completely violates the spirit of the 40 CFR 192 standards to minimize the importance of this situation simply because it is predicted (with no discussion of confidence limits) to occur just after the period of regulatory compliance has ended. The population of the Southwest will likely curse our memories if the tailings are left in place to add this surprise to their water supply.

Response:

The EIS acknowledges the possible existence of an ammonia salt layer in the upper 10 feet of the tailings pile and acknowledges that, if this layer does exist, a second pulse of ammonia contamination may leach from the pile at some point beyond the regulatory period of 200 to 1,000 years if the pile were left in place (Section 4.1.3).

Uncertainties related to the potential salt layer are addressed in item #18 of Tables S−1 and 2−33.

If the on-site disposal alternative were selected, DOE would conduct more detailed field studies to confirm or refute the presence of a salt layer. If the presence of a salt layer were confirmed, additional field studies would then be conducted to characterize and map the salt layer. Based on these characterizations, more reliable transport modeling would be undertaken and, based on the results, a decision would be made regarding the need for mitigation measures. If found to be necessary and appropriate, mitigation measures could include excavation and treatment of the salt layer, which could eliminate the concern over a secondary pulse of ammonia that might occur in the year 3100 time frame.

However, given the still-unconfirmed nature of the data regarding the salt layer or its possible future impacts, DOE has not conducted additional characterization of the potential impacts and associated mitigation measures or evaluated costs beyond the material presented in the EIS. DOE believes that deferring collection of additional data for modeling until after a disposal alternative is selected is appropriate. If an off-site disposal alternative were selected, the additional data would be unnecessary.

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Document #555 Comment #20 Commentor: Hedden, Bill

Finally, the DEIS tells us that onsite tailings disposal will ultimately fail even if there are never any catastrophic floods or earthquakes. The tailings pile is gradually settling due to natural basin subsidence and will be permanently immersed in the groundwater after 7,000−10,000 years. "Ground water beneath the Moab site would remain contaminated, would not be protective of human health, and would continue in perpetuity to discharge contaminants to the surface water at concentrations that would not be protective of aquatic species" (DEIS page 2−119). The words are somber, though DOE refuses to recognize how critical the river might be to a civilization that far in the future. This dismal outcome is obviously beyond the limit of regulatory compliance, but why on earth should we plan for it when there are straightforward alternatives that completely avoid the problem?

Response:

The sentence quoted by the commentor refers to the potential impact of the No Action alternative, which is required by NEPA and CEQ regulations to be addressed in an EIS as a baseline from which to compare impacts among the action alternatives. DOE recognizes and acknowledges in the EIS that the No Action alternative would not comply with 40 CFR 192.

Natural basin subsidence is occurring, and under the No Action and on-site disposal alternatives would result in the tailings pile coming in permanent contact with ground water in 7,000 to 10,000 years. DOE will consider this fact in the final decision-making.

Regardless of whether, in the Record of Decision, DOE ultimately decides to relocate the tailings pile to another location or to cap the tailings pile in place, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with those required under 40 CFR 192.

DOE is not planning for any outcome other than full compliance with 40 CFR 192.
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Document #555 Comment #21 Commentor: Hedden, Bill

Compliance Strategy is Likely Not Protective of Aquatic Organisms

DOE recognizes the difficulty of predicting how various water treatment plans will affect aquatic organisms. "The variables affecting prediction accuracy are many, and the system of contaminant transport and the interaction between groundwater and surface are complex, largely due to the dynamic nature of river stage and backwater area morphology" (DEIS page 2−109). The plan is in error, however, when DOE concludes that it will be conservative and protective of aquatic organisms to aim for the acute lethal dose in groundwater, with no allowance for dilution in surface water.

First, the acute standard of 3 mg/l ammonia aimed at is too high by a factor of five. The State of Utah believes that the chronic and acute standards should both be set at 0.6 mg/l ammonia (DEIS page 2−176). This is corroborated by the Columbia Biological Lab results showing mortality of fish introduced to the near shore waters of the Colorado. Concentrations of ammonia in the range of 3 mg/l kill the fish; that is why this is called the acute lethal dose.

Response:

Data available in the SOWP regarding interaction of ground water and surface water indicate that concentrations of constituents generally decrease significantly as ground water discharges to and mixes with surface water (at least a 10-fold decrease was noted [DOE 2003a, Section 5.6.6]). A more recent calculation set completed after preparation of the SOWP and the draft EIS supports the position that a 10-fold dilution factor does apply in most instances where the ground water plume is discharging to the main branch of the river adjacent to the site. This more recent calculation set (DOE 2005a) also provides a more detailed evaluation of the transfer mechanism between ground water and backwater areas. The USF&WS concurs that DOE's approach is reasonable.

DOE and UDEQ have opposing views regarding the ammonia surface water standard (protective criteria) for a ground water cleanup goal that was used in the EIS. The EIS has been expanded to present and discuss the responsible opposing views of UDEQ and others (Section 2.6.4). The basis for the ammonia surface water standard for a ground water cleanup goal used in the EIS is discussed in Section 2.3.1 and was developed in consultation with USF&WS as specified in the Endangered Species Act. USF&WS states in its Biological Opinion (Appendix A3 of the EIS): "The FWS has considered all of UDEQ's comments in our analysis of the effects to listed species associated with ground water remediation and we agree that many warrant further study (see Incidental Take Statement). Based on our review of the available information, and with recognition that there are uncertainties in both DOE's and UDEQ's analyses, the Service has determined that DOE's premise that 3 milligrams per liter (mg/L) ammonia in groundwater will result in protective concentrations in all surface water habitats presents a reasonable approach to the problem."

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Document #555 Comment #22 Commentor: Hedden, Bill

The goal in groundwater is important, because groundwater truly is not much diluted in some of the most important fish habitat. The conservatism assumed in the DEIS is not real. The young fish depend on side channels and backwaters where groundwater remains relatively undiluted. These are the areas where ammonia concentrations in surface water of up to 1,800 mg/l have been measured, with resultant 100% fish mortality. Young pikeminnows rely principally on these backwater areas for the first 2−4 years of life (DEIS page 3−36). If the goal of 3 mg/l ammonia is reached in groundwater, then significant areas of critical habitat will be kept at a level right at the threshold of lethality for the duration of the active groundwater treatment program. Trying to cut it close on river contamination like this is unwise because the sensitivity analysis shows that the tailings seepage concentration is the key factor in determining whether targets will be met (DEIS page 2−108), and DOE has assumed seepage concentrations near the bottom of the expected range.

Response:

See response to comment #21.
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Document #555 Comment #23 Commentor: Hedden, Bill

The active flushing program may alleviate this situation, but at the cost of complete disregard of the maintenance minimization standard at 40 CFR 192. Would DOE so casually allow for radon releases high above the 40 CFR 192 standard? Again, the groundwater treatment infrastructure will be constructed in the floodplain of the river, subject to possible major flooding, so it is far wiser to remove as much of the future contamination as possible through offsite remediation. This will also offer another benefit not analyzed in the DEIS at all: if the tailings are removed, DOE will be able to install extraction wells across the entire 130 acres above the most intense part of the legacy plume. These will be farther from the river than the system described in the DEIS, hence safer from flooding.

Response:

A provision in 40 CFR 192.02 states that "each site on which disposal occurs shall be designed and stabilized in a manner that minimizes the need for future maintenance." DOE disagrees that active ground water remediation (active flushing) would completely disregard this provision. As noted in Section 2.3.2.3 of the EIS, evaporation ponds would be bermed against 100-year floods. Other provisions to minimize future maintenance requirements would be developed during the design of the long-term ground water treatment system, which would be developed after the Record of Decision. These provisions would be required under either on-site or off-site disposal. The commentor's recommendations are noted and will be considered during development of the Record of Decision.
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Document #555 Comment #24 Commentor: Hedden, Bill

Page 3−27 of the DEIS describes the existence of a large plume of high TDS, ammonia laden water from the tailings pile that has sunk to a neutrally buoyant level in the deeper brine beneath the mill wastes. If the tailings were moved to an offsite location, would it not be possible to complete an extraction well within the plume and remove this potential source of future surface contamination from the groundwater? The FEIS should examine this possibility.

Response:

Under an off-site disposal alternative, it may be possible to install extraction wells within the plume and remove the ammonia contamination in the deeper brine zone after the tailings were removed; however, the high TDS concentrations could themselves be problematic to equipment and waste disposal. If off-site dosposal were selected, this concept would be further evaluated during development of the remedial action plan.

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Document #555 Comment #25 Commentor: Hedden, Bill

River Migration and Major Flooding

The DEIS is most deficient and diverges most radically from the opinions of other experts in its evaluation of the possibilities and consequences of tailings pile failure from flooding or migration of the Colorado River over the thousand year regulatory period. Since such a failure is the most important thing that could possibly occur at the Moab site, this is an unacceptable weakness in the DEIS. Additionally, the analyses on which DOE relies to reach its conclusions are not adequately described in the DEIS, but scattered in many other technical reports, placing an unreasonable burden on interested citizens who are trying to inform themselves.

River Migration

In the 11/2003 Letter Report "Migration Potential of the Colorado River Channel Adjacent to the Moab Project Site," DOE relies on a skewed analysis of scanty data to conclude that subsidence of the Moab Valley will gradually cause the river to migrate south, away from the tailings pile. This seems counter to the facts in several ways. First, the bedrock canyon upstream from Moab will continue to aim and concentrate the energy of the river directly toward the tailings pile as it enters the Moab Valley, and this location and orientation will not change. Second, the most recent data show that the valley fill is deepest north of the present location of the river, so a reasonable projection of greatest future subsidence would lead to the conclusion that the river will migrate north if subsidence is the controlling factor (USGS Initial-Phase Investigation of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab Valley, Grand County, Utah, 2004 Figure 5, page 19). Third, the sediment load carried by the Colorado River is hundreds of times greater than what is needed to compensate for valley subsidence, so the most likely scenario is that the river will continue to meander back and forth across the extreme north end of the valley, including the site of the tailings pile, as it has been doing for thousands of years. DOE seems to be willfully drawing the wrong conclusion when it interprets the fact that the tailings pile is underlain by coarse river cobbles to mean that the toe of the pile is now armored against floods. Floods put all those cobbles there during events of great violence at the tailings site.

DOE also concludes that the channel is stable in its present location. Properly registered aerial photographs, however, reveal that the main channel has moved about 300 feet north in the reach just above the tailings pile since 1962. This large change probably resulted from construction of a small check dam on the south side of the river by Atlas workers who were attempting to deepen the flow along the north bank to increase the efficiency of their water pumps. The fact that a tiny bar can move the river hundreds of feet in decades shows how unpredictable the channel can be across this flat alluvial fan.

DOE's conclusion that the river is moving south also relies on the existence of river gravels on a terrace near the mouth of courthouse Wash and on driftwood recovered from a well boring north of the present Highway 191. That these are north of the present river course is adduced to mean that the river is moving south. However, even momentary study of aerial photographs of the Moab Valley makes clear that the supposed river terrace was never part of the normal course of the Colorado River. For that to be true, the river would have had to exit the mouth of the canyon, make an extreme right-hand turn, and run directly into the mouth of Courthouse Wash with its

Document #555 Comment #25 - continued

towering cliffs. It is far more likely that the river gravels were deposited there during a major flood event, probably during glacial times. Likewise, the buried wood probably was deposited and reburied during the deep scouring associated with flooding in the river. These bits of information tell us more about the dynamic nature of the river floodplain than about long term trends in channel location. The USGS Initial-Phase Investigation of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab Valley, Grand County, Utah, 2004 concludes that large floods will subject the entire north bank of the river to flows exceeding 12-feet/second, which will consequently be carrying large, highly erosive gravels that can deeply scour the river bed and cut away the river bank in dramatic fashion.

Response:

There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these views (Section 2.6.4). See response to comment #8.
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Document #555 Comment #26 Commentor: Hedden, Bill

DOE also argues that floods in Courthouse Wash are likely to deposit sediments on the north side of the river, pushing the channel south. Courthouse Wash has no alluvial fan on the north side of the river, however. It is a high energy stream with a large drainage area, and floods in the drainage tend to occur when the Colorado flows are lowest. At these times, Courthouse Wash floods may exceed the flow in the river by a factor of three or more, causing the floods to jet across the river and deposit sediments on the south bank and in the Matheson Wetland. Aerial photographs support this interpretation. The net result would be to push the Colorado north, toward the tailings pile, just as the Atlas workers' dam did.

Response:

DOE's analyses in the EIS support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these views (Section 2.6.4). The discussion includes the significance of flows from Courthouse Wash and Moab Wash into the river.
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Document #555 Comment #27 Commentor: Hedden, Bill

For all these reasons, the State of Utah and others have questioned the accuracy and reasonableness of DOE's predictions. It is troubling that there appears to be a consistent pattern of the agency downplaying the risks of leaving the tailings in the floodplain of the river. DOE acknowledges the disagreement, but counters by saying that monitoring at the site will allow future managers to take appropriate action to armor the pile, increase groundwater treatment, or ultimately move the tailings to a safer location if agency predictions turn out to be wrong. Without repeating at length our reminder that standards require DOE to plan for minimum maintenance, we point out that while such actions might be possible in the event of gradual river migration, changes in the channel are more likely to occur suddenly during a flood, making mitigating measures impossible. Even if it is possible to take action in time, investing hundreds of millions in moving the tailings after investing hundreds of millions capping them in place is one of the worst possible outcomes from this remediation decision. That is why Loren Morton, of the Utah Division of Radiation Control, described river migration as a "deal breaker." These truly critical shortcomings of the onsite alternative are obscured in the mass of relatively trivial information in the DEIS. DOE should rewrite it in a format that allows readers to understand the big issues without getting lost in the detritus. And DOE should eliminate from consideration the onsite alternative with its credible risk of total failure.

Response:

The NEPA process requires DOE to evaluate all reasonable alternatives, including both on-site disposal and off-site disposal. Monitoring and maintenance activities at the site are one factor among many that will be evaluated when DOE selects the disposal site and method in the Record of Decision.

DOE acknowledges the views of both the commentor and the State of Utah; these views will be considered in DOE's final decision-making.
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Document #555 Comment #28 Commentor: Hedden, Bill

Catastrophic Floods

The person at DOE who will make the decision on the preferred alternative should be required to view the existing photo(s) of the 1917 flood event, when the Colorado River flowed at 76,000 CFS. When looking at the image of the river bursting out of the upstream portal and spreading in rapids all across the Matheson Wetland, this person should be informed that in 1884 there was a flood of 125,000 CFS. Then, this decision-maker should view aerial photos of the valley to understand that the tailings pile was built near the center of the alluvial fan that such floods have built where they break out of the upstream bedrock portal. The tailings pile is built atop coarse cobbles that are periodically scoured away and re-deposited by these floods. In the Probable Maximum Flood calculated by DOE (300,000 CFS), the flood waters would be 25 feet deep at the tailings pile, scouring to a depth of 25−50 feet (deeper scour reduces the depth, but increases the velocity of the floods striking the tailings pile). Since these kinds of floods are essentially certain to occur during the regulatory period, one wonders why the onsite alternative has not been rejected out of hand?

DOE's response seems to have two parts: first, big floods will dissipate their energy in the Matheson Wetland and in whirling around the Moab Valley in a sort of lake, so the tailings impoundment will be able to withstand deep inundation without collapsing. This view is directly contradicted by the recent USGS river modeling cited above, which is the most credible study to date.

The USGS study shows that the tailings pile is well within the 100-year floodplain and that it obstructs the overbank flow during these large floods. Water velocities sufficient to carry large gravels with great erosive force will hit the tailings pile and the northern bank of the river throughout the entire Moab Valley reach of the river. During the 100-year flood, these high erosive forces will inundate the tailings pile to a depth of 4 feet, and a PMF event will bury the tailings in 25 feet of fast moving water, even if the channel stays in its present location. Should the even more extreme erosive forces acting on the riverbank cause the channel to shift, the result would be sudden and devastating. As the predicted surface water elevation charts in the report show (Figure 17 and following), these large floods will cover the entire Matheson Wetland and substantial parts of the community of Moab, entering the Wetland at 40,000 CFS during a flood of one half the PMF. Failure of the tailings pile under these conditions would devastate the community. None of this is discussed in the DEIS. The FEIS must be rewritten to incorporate the USGS modeling results and make them count in the selection of the preferred alternative.

Response:

DOE considers historical flood records in the EIS. In Section 4.1.3.1, the EIS acknowledges the potential for flooding of the tailings pile if the on-site disposal alternative were selected and quantifies the impacts that could result from such inundation. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. If on-site disposal were selected, the disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river

Document #555 Comment #28 - response continued

encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if on-site disposal were selected.

The EIS assumes that a catastrophic flood event (300,000 cfs, the NRC-specified PMF) will occur no more than once in 500 years, or twice during the 1,000-year regulatory period. However, the possibility of a catastrophic flood cannot be eliminated because part of the Moab site tailings impoundment is located within the 100-year floodplain of the Colorado River and within the floodplain of the PMF of both the Colorado River and Moab Wash. The 100-year floodplains for Moab Wash and the Colorado River occupy over one-third of the Moab site. However, during floods that exceed bankfull flow capacities of the Colorado River, most of the flow and flow energy are dissipated in the Matheson Wetlands Preserve away from the tailings pile.

Section 4.1.17 in the EIS addresses impacts from a catastrophic cell failure. Although the likelihood of a catastrophic event would be very small over the design life of an on-site disposal cell, this type of failure was assumed to occur in order to evaluate the potential consequences. The EIS acknowledges that if 20 to 80 percent of the tailings pile were washed into the river, it would have serious adverse impacts on the riparian plant and animal life and would affect the health and safety of residents along the river and of river guides. Such a flood could also affect the tourist economy of Moab if users of the river corridor subsequently avoided the area.
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Document #555 Comment #29 Commentor: Hedden, Bill

The second part of DOE's response to the likelihood of flood induced impoundment failure is that it will not really matter if it happens. This is where the chronic underestimation of the importance of the river causes the DEIS to go most badly off track.

Beginning on page 4–53, the DEIS examines a tailings failure during a 150,000 CFS flood. As noted, the first error in this analysis is its failure to discuss the deposition of tailings material far up into the City of Moab. If the valley becomes a lake, as DOE asserts, then the tailings will be spread across the footprint of that lake, with devastating and extraordinarily expensive consequences for the community. This issue is completely ignored in the DEIS.

Response:

DOE acknowledges the great complexity and dynamics of the Colorado River. Furthermore, in Section 4.1.3.1 of the EIS, DOE acknowledges the risks associated with the potential for flooding of the tailings pile under the on-site disposal alternative and quantifies the impacts that could result from such inundation. These impacts would include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in Section 2.1.4, an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if this alternative were selected.

DOE analyzed the impacts of a catastrophic flood (300,000 cfs, which is the NRC-specified PMF) and determined that it would not have sufficient force to cause failure of an on-site disposal cell with engineered mitigation measures such as side slope armaments. However, for purposes of comparative analysis in the EIS, DOE assumed that a highly unlikely failure occurred and quantified the impacts in Section 4.1.17. This is will be one factor among many that will be evaluated when DOE selects the disposal site and method in the Record of Decision.

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Document #555 Comment #30 Commentor: Hedden, Bill

The DEIS goes on to describe the deposition of tailings material throughout the river channel and in the riparian area all the way down through Lake Powell. It is worth noting that the calculations of expected contaminant concentrations are probably incorrect in several important ways. First, the analysis assumes that the Green River will provide a diluting flow of 125,000 CFS, but the likelihood of a simultaneous historic flood from that completely separate drainage basin is vanishingly small. Second, the analysis does not say what diluting volume is used in the calculation for Lake Powell, but that reservoir is now holding just 8 million acre feet and may never be filled again now that the upper basin is beginning to appropriate its full share. Moreover, during the long regulatory timeframes, the reservoir will be filled with sediment and Glen Canyon Dam likely decommissioned. If the dilution calculation assumed anything like the reservoir’s full 26 million acre foot volume, then it is in error.

Response:

The calculations are meant to provide a general overview of contaminant transport issues. The ratio of water mass in the Colorado River to the Green River is 1:2, based on a USGS 30-year average. It is likely that when the Colorado River Basin is at high flood stage, the Green River Basin would also be experiencing relatively high water; thus, it is reasonable, at least as a first approximation, to assume that the ratio remains constant.

The calculation assumes mixing with 10 million acre-feet in Lake Powell. This value is well below the full capacity but slightly exceeds the current 8 million acre-feet. DOE believes the value used is reasonable given the uncertainty in future reservoir levels.
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Document #555 Comment #31 Commentor: Hedden, Bill

Despite these conceptual and computational problems, the DEIS still paints a picture of disaster. The length of the river corridor all the way down past Lake Powell would be covered with radioactive wastes, with uranium and ammonia at levels 5−10 times the maximum protective criteria for aquatic species all the way to Lake Powell. As shown in Table 4−18, radium, which becomes the main contaminant of concern in pile failure scenarios, would be at levels of 515−2,060 pCi/g at the Green River, as compared to the 40 CFR 192 standards of 515 pCi/g. The DEIS completely fails to account for human health effects from the proposed St. George pipeline, which may soon withdraw 70,000 acre feet of drinking water from Lake Powell. Yet, without really examining what contaminants might reach human receptors in this river reach or downstream, the DEIS simply says, “A major tailings release is not anticipated to significantly increase risks to human populations downstream of Lake Powell” (DEIS page 4−56). This is simply not good enough as an analysis of the health risks of dumping millions of tons of toxins into the water supply for 26 million people. It also balances savings in the cost of remediation against potentially far larger costs to local and regional economies.

Such a flood and tailings failure would be, for a time, the main news story in the nation. The city of Moab would be evacuated. Unimaginable amounts would be spent on clean up of the city and the river corridor. As the Metropolitan Water District wrote in its letter to Dr. Kai Lee, Chair of the National Research Council on Long Term Institutional Management of DOE Legacy Waste Sites, the 26 million downstream consumers of Colorado River water buy bottled water if they perceive the safety of their tap water is threatened. If just one in 40 downstream users switched to bottled water after such an event it would cost the citizens of the Southwest $240 million dollars within a year. Another omission in the DEIS is the failure to consider the effect of a tailings failure on the recreational economy of southeast Utah. Visits to Moab, river trips and the use of Lake Powell would all be drastically curtailed, with impacts running to hundreds of millions of dollars. The DEIS does not analyze these outcomes, despite the fact that the economic consequences are about as large as the entire costs of the millsite reclamation. Though these economic issues have been repeatedly raised with both DOE and NRC before it, they have never been analyzed in a decision document.

Response:

See response to comment #28.
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Document #555 Comment #32   Commentor: Hedden, Bill

Summary

The DEIS compares an onsite remediation with several offsite options, but the document attempts to minimize the stark differences between these options. Either the Klondike or Crescent Junction alternative would almost certainly result in long term isolation of the wastes from the human and natural environment without the need for significant maintenance.

Response:

No attempt to minimize the differences among alternatives has been made. The EIS characterizes, in detail, the differences pointed out by the commentor in Chapter 4.0 of the EIS and summarizes the differences in Section 2.6.1.
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Document #555 Comment #33   Commentor: Hedden, Bill

Compared with the near ideal Klondike and Crescent Junction alternatives, the White Mesa alternative is an expensive, high tech boondoggle that will cause unacceptable impacts to the White Mesa Ute tribe and numerous sacred cultural sites, as well as along the length of the 85 mile pipeline or truck route. It offers no benefits except the questionable one of consolidating wastes at a site with numerous environmental drawbacks. DOE would be at a complete loss trying to explain how that alternative could be chosen as the preferred one, and we hope that we do not have to witness the attempt in the FEIS.

Response:

Section 2.7.3 does identify the White Mesa Mill alternative as the most expensive of the alternatives considered. In addition, impacts to sacred sites from site development or pipeline construction would occur. However, no impacts to sacred cultural sites due to the truck transportation option have been identified. DOE has identified the Crescent Junction site as its preferred location for a disposal cell, using rail as the primary mode of transportation, and will continue to consider these factors in its final decision-making.
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Document #555 Comment #34 Commentor: Hedden, Bill

The DEIS examines the onsite alternative at great length despite the fact that is should be dropped from consideration. As a near unanimous chorus of elected officials and scientists has said, it is not acceptable to leave 12 million tons of mill wastes leaking into the Colorado River, directly in the path of a major flood. Every possible savings from capping in place is offset by a huge risk of tailings failure. Onsite reclamation simply shifts the well defined burden of cost from the federal government, where it belongs, to an unspecified but possibly much larger burden of health risks and costs for the population of the Southwest. On page 2−177 the DEIS says, “Human and ecological risks, long and short term environmental impacts have been fully developed and evaluated in this EIS.” That will only be true if the eventual decision is to relocate the tailings. It is long past time to make the decision to remove these mill wastes from the bank of the river and the water supply for 26 million people.

Response:

The on-site disposal alternative has been retained for consideration as a reasonable alternative, consistent with the requirements of NEPA (40 CFR 1502.1). DOE believes, and the EIS indicates, that on-site stabilization could be implemented to comply with the requirements of UMTRCA and 40 CFR 192 without unacceptable adverse impacts on public health and safety and the environment for the minimum regulatory period of 200 to 1,000 years. Section 2.6.3 identifies the uncertainties associated with the disposal alternatives, and Section 2.6.4 identifies responsible opposing views to those of DOE on several technical issues.
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Document #556 Comment #1 Commentor: Hartsfield, Sam—Port of Portland

Existing groundwater contamination at the Moab site is currently discharging into the Colorado River, resulting in impacts to surface water quality. Groundwater remediation is not expected to result in decreased levels of ammonia being discharged to the river for a minimum of 35 to 50 years after the active remediation activities have begun (Figure 4−7). The plan includes removing a stand of mature tamarisk trees that currently occupies the floodplain between the Moab tailings pile site and the Colorado River. Section F.2.1.3. states that the tamarisk currently removes a significant portion of the groundwater and the pollutants associated with it, thus resulting in a reduction of the total pollutants being discharged to the river. While I applaud the idea of removing a stand of invasive species, there are three reasons why these tamarisks should be left in place for the time being. First, removing these agents of phytoremediation before the active groundwater remediation begins to have a measurable effect will simply result in a higher concentration of ammonia and other pollutants in the river downstream of the Moab site in the interim. Even if other measures are in place, such as trenches or wells to intercept groundwater, the tamarisk will further decrease the amount of polluted water entering the river if they are left in place. Second, the plan suggests replacing the tamarisk with deep-rooted native species. Stream flow at this site has been altered due to upstream diversions, and the tamarisk has stabilized the bank such that this floodplain is now inundated less than once every 5 years. Unlike tamarisk, native riparian species such as Populus spp and Salix spp cannot thrive or even become established without regular inundation. Another option suggested in the plan is cultivating salt-tolerant crops. The plan states that the water table is generally at least 5 feet below the surface, whereas most crop plants have root systems that are too shallow to effectively remove significant quantities of groundwater from such depths. Third, even if it were possible to reestablish native plants in the floodplain, the process would likely require an active management strategy, given the generally unfavorable site conditions for the types of plants that would perform phytoremediation. No such strategy is suggested or even mentioned.

Please explain why it is necessary to remove the tamarisk early in the project rather than leaving it in place until groundwater ammonia concentrations have decreased substantially. Also, please provide more information on alternatives, such as a list of potentially cultivated crops and their transpiration rates and a restoration or management strategy for establishing native plants in the floodplain.

Response:

In Section F2.1.3, the EIS states that deep-rooted vegetation at the site—predominantly tamarisk—is removing a significant volume of contaminated ground water from the shallow aquifer. Ammonia in the ground water is metabolized by or accumulated in the plant tissues. Because other contaminants of concern may not be accumulated by this technology, and the extraction depth is limited to the rooting depth, phytoremediation would be used in combination with some other active treatment. This process could be enhanced and water uptake increased by planting additional vegetation within the area of ground water remediation. Because of recent efforts across the western United States to control and eliminate tamarisk in certain areas, existing vegetation could likely have to be replaced in the future with more desirable salt-tolerant species if phytoremediation were to continue.

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Document #557 Comment #1 Commentors: Members of Congress

We are writing to voice our unified support for removing the uranium tailings pile from the Atlas Mill site to another location further from the banks of the Colorado River.

Response:

DOE acknowledges the concerns of the members of Congress and their support for removal of the tailings pile from the Moab site. DOE will consider these concerns in its final decision regarding disposition of the tailings pile. Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.
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Document #557 Comment #2 Commentors: Members of Congress

Currently, the tailings pile rests 10−15 feet above the water level of the Colorado River, a major water source for the millions of people who live downstream. The U.S. Geological Survey has recently stated that during a Probable Maximum Flood the Colorado River could feasibly climb 25 feet up the tailings pile, the channel could deepen and narrow, and water could move much more swiftly through the tailings site. Recent floods throughout the Southwestern United States are a clear demonstration of the path deviation that rivers can take and of the heavy water flows that can occur during extreme weather conditions. They also serve as a reminder that so-called floods are a reality that the Department of Energy must take into account when making the decision about the Atlas tailings pile.

Studies have found that tile Colorado River has reached a flow level great enough to inundate the base of the Atlas tailings pile and leach contaminants like uranium, molybdenum, and nitrates into the river water on at least 26 occasions during the past 100 years. Additional studies have found that significant levels of contaminants are leaching into the Colorado River from the pile even when flooding is not present. The removal of the tailings pile from this site is necessary for the health and safety of the people living in Utah, Nevada, Arizona, California, and Mexico whose drinking water comes from the Colorado River.

Response:

If the on-site disposal alternative were selected, the recent USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall. The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials would be sized to withstand the maximum river forces identified by USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment. These measures would reduce the already low probability of a catastrophic failure of an on-site disposal cell.

The USGS report states that under a PMF scenario, the river level would be 25 feet above the toe of the tailings pile. Under the 100-year flood scenario, the river level would be approximately 4 feet above the toe of the pile, as occurred during the 1984 flood. During this flood, the unprotected pile was not breached because velocities decrease when the river flows over its banks. In the EIS, DOE acknowledges the potential for the pile to be inundated during floods. The potential impacts to human health and the environment as a result of the release of additional contaminants to the ground water in a 100-year or greater flood are addressed in Section 4.1.3.1 of the EIS.

Extensive site characterization has been performed to confirm that the bottom of the contaminated tailings pile is not in contact with the water table. However, contaminants have leached from the tailings pile and have impacted the ground water. DOE has undertaken interim actions at the Moab site that must be done, regardless of decisions made pursuant to the NEPA process, to reduce contaminant migration. These actions include (1) capturing and evaporating some of the most contaminated ground water from the legacy plume that is entering the Colorado River, and (2) reducing the contaminant seepage from the pile area that has potential to migrate into the ground water beneath the pile. These interim actions have proven to be effective in significantly reducing the total mass of contaminants reaching the river.

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Document #557 Comment #3 Commentors: Members of Congress

We are particularly concerned that the Department of Energy's Draft Environmental Impact Statement for the Atlas Tailings site did not identify the removal of the tailings pile as a preferred alternative. A report by the National Academy of Sciences emphasized the risks posed by the location of the radioactive tailings next to the Colorado River, stating it was a "near certainty" that, left unchecked, the river would run across the Moab site at some point in the future. The Department of Energy has previously stated that the legislative history of UMTRCA stressed the importance of avoiding remedial action that would only be temporarily effective, and for every other site located in a floodplain the Department of Energy has chosen to remove the tailings. We believe that Congress is committed to the removal of this tailings pile, having passed legislation directing the removal of the pile and having appropriated funds toward the remediation of this site in Fiscal Years 2001, 2002, 2003, 2004, and 2005.

As elected representatives, it is our responsibility to convey to the Department of Energy the hazards created by the continued presence of the tailings pile near the source of water for many of our constituents. We hope that you will work with us toward the removal of the Atlas Tailings pile, the only remaining tailings pile on the banks of the Colorado River.

Response:

DOE had not identified a preferred surface remediation alternative when the draft EIS was published. In the final EIS, DOE has identified removal of the tailings pile to the Crescent Junction site by rail as its preferred surface remediation alternative.

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Document #558 Comment #1 Commentor: Utah Department of Environmental Quality

The enclosed comments from the Department of Environmental Quality (DEQ) focus on several issues that continue to support moving the pile. Among those concerns are: 1) the potential for the Colorado River to migrate and damage the tailings pile if it is left on the mill site; 2) the uncertainty of costs associated with long-term groundwater cleanup; 3) the acknowledgement by DOE that a second pulse of ammonia contamination will leach from the upper layers of the pile, if left in place; 4) the increased clean-up costs for groundwater in the future if the pile is not moved; and 5) use of the wrong ammonia surface water standard for a groundwater cleanup goal.

Response:

DOE has carefully considered the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS. Based on these considerations, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4 of the EIS.

DOE appreciates the role UDEQ has played in the Moab Project as a cooperating agency in the development of the EIS. As becomes clear in the following comments and responses, there are several areas on which DOE and UDEQ hold differing opinions. Despite theses differences, DOE will continue to work with cooperating agencies, including the State of Utah, to protect human health and the environment within the regulatory requirements of 40 CFR 192.

The following paragraphs address the five specific concerns noted in the comment. These concerns are also addressed in response to subsequent UDEQ comments.

1. Section 4.1.17 and Section 2.6 of the EIS discuss the potential for the Colorado River to migrate and damage the tailings pile if the pile were not relocated. There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these views (Section 2.6.4). If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the already highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials would be sized to withstand the maximum river forces recently identified by the USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment. The final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan if the on-site alternative were selected. The estimated cost range for remediation shown in Table 2−33, item #9, would accommodate materials consistent with the recent USGS report.

Document #558 Comment #1 - response continued

Section 4.1.17 of the EIS also addresses the natural processes that could potentially cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks. These include impacts to downstream users, aquatic receptors, backwaters, terrestrial biota, and adjacent areas. The focus of the analysis is to evaluate the potential consequences of contaminants in the water and sediments of the Colorado River based on a significant (catastrophic) release of tailings.

Although the probability of a significant release would be very small over the design life of the on-site disposal cell, this type of failure was assumed to occur in order to evaluate the potential consequences (risks). The section specifically acknowledges that river migration could occur and could affect the integrity of the cell.

2. The uncertainty of costs associated with long-term ground water cleanup is addressed in Section 2.7.3 through the addition of a 10-percent contingency on the total project estimate and the qualification that the budget estimate is expected to fall within the range of -15 percent to +30 percent. In addition, a new Section 2.6.4 in the EIS addresses, to the extent possible, the implications of the various uncertainties identified in the EIS, including cost, and the inherent limitations of attempting to precisely quantify them.

3. The EIS acknowledges the possible existence of an ammonia salt layer in the upper 10 feet of the tailings pile and acknowledges that if this layer does exist, a second pulse of ammonia contamination may leach from the pile at some point beyond the regulatory period of 200 to 1,000 years if the pile were left in place (Section 4.1.3). Based on modeling, DOE estimated that the leaching effects of an ammonia salt layer would not be observed at the underlying water table for 1,000+ years and, in the absence of any remediation, could continue for about 440 years. DOE did not simulate this effect with the contaminant flow and transport model or estimate costs because the existence of the salt layer has not yet been confirmed and also because the regulatory time period for the design of the cell is 200 to 1,000 years (40 CFR 192). Furthermore, as discussed in the SOWP (Section 6), attenuation processes (i.e. biological degradation, sorption, etc.) make it likely that ammonia concentrations in the tailings fluid near the base of the pile would be considerably less. Uncertainties related to the potential salt layer are addressed in item #18 of Tables S−1 and 2−33.

If the on-site disposal alternative were selected, DOE would conduct more detailed field studies to confirm or refute the existence of the salt layer. If the existence of the salt layer were confirmed, additional field studies would then be conducted to characterize and map the salt layer. Based on these characterizations, more reliable transport modeling would be undertaken and, based on the results, a decision would be made regarding the need for mitigation measures. If found to be necessary and appropriate, mitigation measures could include excavation and treatment of the salt layer, which could eliminate the concern over a secondary pulse of ammonia that might occur in the year 3100 time frame. However, given the still-unconfirmed nature of the data regarding the salt layer or its possible future impacts, DOE has not conducted additional characterization of the potential impacts and associated mitigation measures or evaluated costs beyond the material presented in the EIS.

Document #558 Comment #1 - response continued

In DOE's opinion, deferring the collection of more precise and accurate data with which to model the transport of a postulated feature of the tailings pile until such time as a Department decision might make such information unnecessary (i.e., a decision to implement off-site disposal) is appropriate. In its June 11, 2002, report to DOE, the NAS Board on Radioactive Waste Management endorsed such an approach.

4. See item #2 above.

5. UDEQ and DOE have opposing views regarding the ammonia surface water standard (protective criteria) for a ground water cleanup goal that was used in the EIS. The EIS has been expanded to present and discuss the responsible opposing views of UDEQ and others (Section 2.6.4). The basis for the ammonia surface water standard for a ground water cleanup goal used in the EIS is discussed in Section 2.3.1 and was developed in consultation with the (USF&WS as specified under the Endangered Species Act. With regard to DOE's and UDEQ's opposing views regarding protective criteria, USF&WS states in its Biological Opinion (Appendix A3): "The FWS has considered all of UDEQ's comments in our analysis of the effects to listed species associated with ground water remediation and we agree that many warrant further study (see Incidental Take Statement). Based on our review of the available information, and with recognition that there are uncertainties in both DOE's and UDEQ's analyses, the Service has determined that DOE's premise that 3 milligrams per liter (mg/L) ammonia in ground water will result in protective concentrations in all surface water habitats presents a reasonable approach to the problem."

DOE's estimates of the duration and cost of ground water remediation are predicated on the assumption that 3 mg/L ammonia in groundwater will result in protective concentrations in all surface water habitats. However, a new Section 2.6.4 has been added to the EIS which addresses, to the extent possible, the potential implications should the DOE and USF&WS view on this issue be in error and the UDEQ position be determined to be correct. If applicable protective criteria could not be achieved or would require longer than DOE estimates, DOE recognizes that the duration of ground water remediation, especially under the on-site disposal alternative, would be substantially longer than estimated in the EIS, and that the estimated $906,000 per year cost of ground water remediation would continue beyond the currently estimated 75 to 80 years (also, see response to comment #2).

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Document #558 Comment #2 Commentor: Utah Department of Environmental Quality

Calculations by DEQ included in the comments show that, with a continued need for 200 or more years of actual groundwater cleanup, beyond the assumed 200 years in the DEIS, the costs for the On-site Stabilization Alternative are comparable to the costs for moving the tailings to Klondike Flats. Based on those considerations, moving the pile is a cost-efficient solution, which also avoids the risk of river migration and possible undercutting of the pile. If the second pulse of ammonia contamination is considered, as discussed in the DEQ comments, an additional 440 years of active groundwater remediation could be necessary. Under that scenario, moving the tailings to Klondike Flats is less expensive.

Response:

DOE's modeling and analysis in the EIS indicate that ground water cleanup is anticipated to take approximately 80 years under the on-site disposal alternative. This is predicated on the DOE and USF&WS view regarding the appropriate and applicable ammonia surface water standard (protective criteria) for a ground water cleanup goal. (See response to comment #1, item #5.) Although DOE and UDEQ have opposing views (Section 2.6.4) on this point, DOE acknowledges that if the ground water cleanup standard proposed by the State of Utah were applicable, then the duration of requisite ground water cleanup would be longer and the cost of cleanup proportionately greater. DOE also acknowledges that if the ground water cleanup standard proposed by the state were applicable, it might be impossible to ever achieve protective criteria under the on-site alternative; therefore, the duration of requisite ground water treatment would be open-ended, and the cost of ground water remediation under the on-site alternative could be very high.

DOE agrees that moving the pile avoids the risk of river migration and acknowledges the possible existence of an ammonia salt layer. DOE does not agree that the ammonia salt layer, if it exists, would necessarily require an additional 440 years of ground water remediation in the future because if the on-site alternative were selected, DOE would examine mitigation measures that could include excavation and treatment of the salt layer.
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Document #558 Comment #3 Commentor: Utah Department of Environmental Quality

Referenced and included as part of DEQ's comments are two studies regarding river migration, potential erosion of the tailings, and hydrology of the systems:

Attachment 1 - U.S. Geological Survey, Scientific Investigations Report No. 2005-5022; Initial-Phase Investigation of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab, Valley, Grand County, Utah, 2004, by Terry a. Kenney, dated February 11, 2005.

Attachment 2 - Investigation of the Hydrologic Connection Between the Moab Mill Tailings and the Matheson Wetland Preserve, by Philip Gardner and D. Kip Solomon, Department of Geology and Geophysics, University of Utah, dated December 11, 2003.

Also enclosed are two letters, both dated February 9, 2005, with comments from the Utah Division of Wildlife Resources and the Utah Division of Forestry, Fire and State Lands.

Response:

DOE has taken these reports into consideration. The EIS has been revised to present and discuss the responsible opposing views on river migration and on contaminant transport under the river (Section 2.6.4). DOE has addressed these reports in subsequent UDEQ comments in which they are referenced.

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Document #558 Comment #4 Commentor: Utah Department of Environmental Quality

The time has come to move the pile off the banks of the Colorado River and transport it to a repository at Klondike Flats. Thank you for your ongoing stewardship responsibilities for the Moab Millsite and your consideration of the enclosed comments.

Response:

DOE appreciates UDEQ's recognition of our ongoing stewardship efforts and will carefully consider all factors and input in its decision-making process. Based on careful consideration of the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4 of the EIS.

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Document #558 Comment #5 Commentor: Utah Department of Environmental Quality

1. Groundwater Remediation Costs / Timeframes (p. S−9) – should the pile be stabilized in place, the 75 – 80 year timeframe estimated by DOE for groundwater cleanup could be greatly under-exaggerated. The magnitude of this under-estimation could be great relative to the total on-site cleanup cost. Details about the factors behind this under-estimation are discussed below. Despite these problems, relocation of the tailings pile would eliminate the above-ground contaminant source term. Therefore, the shallow aquifer would passively clean itself over a period of time. As a result, any expense made now to relocate the pile could prevent dramatic long-term costs in the future.

Response:

See response to comment #2.
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Document #558 Comment #6 Commentor: Utah Department of Environmental Quality

2. Duration of Groundwater Remediation and Implications for Total Cleanup Costs (p. S−11) – we take exception to the DOE statement that "… duration of the action would likely be essentially the same regardless of whether the pile was remediated in place or relocated". Any truth in this statement is due only to DOE's arbitrary use of the acute ammonia-nitrogen standard (3.0 mg/l) as a groundwater cleanup goal. Should the lower chronic ammonia-nitrogen standard (0.6 mg/l) be required as a groundwater cleanup goal, the on-site option would require active ground water remediation for a much longer timeframe, perhaps more than 200 years (DEIS, Figure 2−43). This extended operation would greatly increase the total cost of the on-site stabilization option, in that 120 extra years of operation would cost on the order of $108,000,000. This would increase the total life-time cost of the on-site option from $248.8 Million to $356.8 Million.

Even longer periods of active groundwater remediation may also be required. Unfortunately, the DOE contaminant transport model used to evaluate this need was limited to a 200 year simulation (DEIS Fig. 2−43). However, other DOE information indicates that the leaching effects of an ammonia salt layer found in the upper reaches of the tailings pile, will not be observed at the underlying water table for about 1,100 years. This same DOE information also suggests that after arrival of the second pulse of ammonia, it would take another 440 years for infiltration from the on-site cover system to eliminate it from the tailings pile (SOWP, p. 6−11 and 12). To date, DOE has not simulated this anticipated long-term ammonia transport (1,500 years). If these simulations were conducted it may show that over 640 years of active groundwater remediation would be required to adequately contain and control the ammonia discharge to the backwater habitats. If this were the case, the projected groundwater remediation costs could be as high as $576 Million (640 years x $900,000/year). This would increase the total cost of the project to well over $749 Million ($248.8 Million (DEIS Table 2−35) - $75.3 Million + $576 Million). In this case, an off-site remediation option would be more viable economically. However, removal of the tailings pile would eliminate this possible complication and financial risk to the public.

Document #558 Comment #6 - continued

Response:

For a response to the first part of the comment, which relates to the applicable ammonia standard, see responses to comment #1, item #5, and to comment #2. In addition, DOE believes that its use of the acute ammonia-nitrogen standard (3.0 mg/L) as a ground water cleanup goal is reasonable. Acute and chronic ammonia criteria in surface water are based on the national AWQC. The acute criteria is a function of water pH, while the chronic criteria is a function of water temperature and pH. The federal criteria documentation does not recommend using an average temperature and pH to calculate a single applicable value for the standards, but rather a range of standards that may apply under observed pH and temperature conditions. Chronic aquatic criteria represent the low end of the potential concentration range for protection of aquatic species from ammonia toxicity. Most of the chronic values measured in the surface water at the site range from 0.6 to 1.2 mg/L ammonia (total as N) based on site-specific pH conditions. Acute criteria represent the higher end of the concentration range; the majority of acute values measured in the surface water range from 3 to 6 mg/L based on site-specific temperature and pH conditions. Therefore, it is DOE's position that ammonia concentrations (total as N) in surface water in the 0.6- to 6-mg/L range would be fully protective of aquatic life. The USF&WS supports DOE's position in its Biological Opinion (Appendix A3).

As discussed in Section 2.3.1.2, if ammonia concentrations in the ground water met the surface water standards, then discharge of ground water to surface water should not result in exceedances of those standards unless some other process (e.g., evaporation) increased contaminant concentrations in surface water. However, establishing the low end of the protective range as the ground water cleanup goal is probably not necessary to achieve compliance with surface water standards. Data available in the SOWP regarding interaction of ground water and surface water indicate that concentrations of most constituents decrease significantly as ground water discharges to and mixes with surface water (a 10-fold decrease is observed on average [DOE 2003a]). A more recent calculation set completed after preparation of the SOWP and the draft EIS supports the position that a 10-fold dilution factor does apply in most instances where the ground water plume is discharging to the backwater areas adjacent to the site. In background locations where elevated ammonia from the Paradox Formation is discharging to the surface water, the 10-fold dilution factor may not apply. This more recent calculation set (DOE 2005a) also provides a more detailed evaluation of the transfer mechanism between ground water and backwater areas. This reference has been updated in Section 2.3.1.2 of the EIS, and the calculation set has been made available in the public reading rooms.

Consequently, there is a reasonable assurance that protective surface water concentrations could be achieved by meeting less conservative goals than chronic standards in ground water. For this reason, DOE proposes to use the 3-mg/L concentration of ammonia as a target goal for evaluating ground water cleanup options. However, the ultimate remediation objective would still be to meet all applicable ammonia standards, both acute and chronic, in surface waters to be protective of backwater habitat.

UDEQ states that, should DOE be required to meet a ground water concentration of 0.6 mg/L, then the active ground water treatment for the on-site alternative would be extended by an additional 120 years. The commentor references Figure 2−43 in the EIS to support this position. However, the predicted concentrations shown in Figure 2−43 represent the maximum

Document #558 Comment #6 - response continued

concentration at a single cell (location) located downgradient from the center of the plume. This is the location where the maximum concentration would be expected to occur and was presented in Figure 2−43 as a conservative estimate for the purpose of evaluating alternatives. A better idea of what the distribution of ammonia concentrations would be in 200 years under the on-site alternative is to examine the modeling results presented in Figure 4−3. This figure shows that nearly all of the ammonia concentrations along the river bank would range from 0.2 to 0.5 mg/L. In fact, the average concentration would reach the 0.6-mg/L chronic value in approximately 140 years, which would extend the period of active remediation by 60 years, rather than the 120 years as suggested by the commentor. However, even 60 additional years is not realistic because the DOE model is conservative and does not account for processes such as biological degradation that make it likely that ammonia concentrations would be considerably less. Therefore, estimating costs associated with an extended active ground water remediation period for the on-site alternative is not appropriate and comparable to the other alternatives. Uncertainties related to the remediation time frames, costs, etc., are addressed in Tables S−1 and 2−33, item #1.

For a response to the second part of the comment, which relates to the possible salt layer, see response to comment #1, item #3.
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Document #558 Comment #7 Commentor: Utah Department of Environmental Quality

3. Effects of River Migration on Floodplain and Wetlands (p. S−14) – we agree that the 100 and 500-year flood events could partially inundate the tailings pile, should it be stabilized in place. However, recent river velocity and shear force modeling performed by the USGS shows that erosion could easily occur on the right riverbank under both of these flow regimes (Kenney, Fig. 47 and 48, see Attachment 1, below). This same modeling shows how water velocities and shear forces under the 100-year flood event will be high enough inside the river's channel, across the entire length of the river in Moab Valley, to transport medium-sized (1.45−2.91 inch diameter) gravel (ibid., Fig. 47). Even larger particle sizes can be transported by higher river flow rates (ibid., Figs.48 and 49) , or under conditions where the river has scoured its channel near the West Portal (ibid., Figs. 50, 53, and 56).

Given these recent USGS findings, it is easy to see how a 100-year flood event could easily erode the much finer silts and sands found in the riverbank near the tailings pile. It is also easy to conceive how under these conditions, the river could easily avulse its channel and rapidly undercut and destabilize part of the tailings pile. This de-stabilization could contaminate the floodplain and other downstream areas with residual radioactive material.

Response:

See response to comment #1, item #1, regarding river migration.
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Document #558 Comment #8 Commentor: Utah Department of Environmental Quality

4. Long Term Effects on Aquatic Ecology (p. S−15) – based on the uncertainties involved in groundwater remediation costs, and the need to apply the chronic ammonia-nitrogen standard as the groundwater cleanup goal, the DOE statement at the top of this page that the adverse effects on aquatic ecology would be eliminated for 200 to 1,000 years would consequently dictate that the active groundwater remediation system be operated for at least 200 years (see discussion above). Under this scenario, the cost to the general public would be much larger than estimated by DOE. This adverse financial risk to the project must be considered in DOE's determination of a permanent solution for the site.

Even larger periods of time may be required for active groundwater remediation under the on-site option. DOE has already mentioned concern for the effects that leaching of the ammonia salt layer found in the upper reaches of the tailings pile, would have on the underlying groundwater quality. As discussed above, DOE failed to evaluate this secondary pulse of ammonia that would arrive at the underlying water table at about 1,100 years after on-site cover construction. Because it may take about 440 years to eliminate this pulse of leachate from the tailings system, the DOE contaminant transport models should have been run for at least 1,500 years. Should this secondary pulse of ammonia cause the groundwater to exceed the chronic cleanup goal (0.6 mg/l), it may be necessary to actively treat groundwater under the on-site option for 640 years or more. This would result in a tremendous increase in the on-site groundwater remediation costs, from about $75.3 Million (DEIS, Table 2−35) to $576 Million, and thereby increase the total on-site cleanup cost from $248.8 Million to $749.5 Million ($248.8 Million – $75.3 Million + $576 Million).

Response:

For a response to the first part of the comment relating to the applicable compliance standard, see responses to comment #1, item #5; comment #2; and comment #6.

For a response to the second part of the comment relating to the potential ammonia salt layer, see response to comment #1, item #3.

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Document #558 Comment #9 Commentor: Utah Department of Environmental Quality

5. Waste Management: Evaporation Residue from Groundwater Remediation (p. S−20) – we take exception with the statement that this residue would only need to be managed for 75−80 years. As discussed above, the time it takes to cleanup the local groundwater could be as high as 200 years or more. Any such increase in the required time would bring with it additional costs for residue disposal. However, removal of the pile would eliminate this risk in the estimated cleanup costs.

Response:

The length of time that radioactive material residue would need to be managed is approximately the same as the length of time required for ground water remediation. This is directly related to the applicable compliance standard, which is addressed in the responses to comment #1, item #5; comment #2; and comment #6.
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Document #558 Comment #10 Commentor: Utah Department of Environmental Quality

6. Consequences of Uncertainty: Omission of River Migration Effects (p. S−34) – the description in this section omits the most significant category of uncertainty for the project; that being pile de-stabilization by river migration. These consequences must clearly be described in the DEIS. DEQ's concerns with river migration are discussed in detail below.

Response:

River migration effects are addressed in Tables S−1 and 2−33, item #10, of the EIS. Although a catastrophic failure of an on-site disposal cell would be highly unlikely, the potential impacts of such an event are assessed in Section 4.1.17 of the EIS. Also, see response to comment #1, item #1, regarding river migration.
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Document #558 Comment #11 Commentor: Utah Department of Environmental Quality

7. Consequences of Uncertainty: Groundwater Model Calibration (p. S−35) – the need to calibrate and refine the groundwater model to predict future ground and surface water concentrations is largely academic if the pile is relocated. Existing DOE contaminant transport models show how removal of the pile will allow the nearby groundwater to regain the chronic ammonia-nitrogen standard (0.6 mg/l) under passive groundwater flow conditions within 90 years (DEIS, Figs. 2−43 and 4−7).

Response:

Calibration of the ground water flow and transport model is detailed in Section 7 of the SOWP. DOE agrees with the commentor that refining the model would be unnecessary if DOE were to select an off-site disposal alternative.
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Document #558 Comment #12 Commentor: Utah Department of Environmental Quality

8A. Ground Water and Site Conceptual Model Assumptions: Omission of Dispute Over Groundwater Cleanup Goal (p. S−36) – the discussion in this paragraph omits any mention of the dispute with Utah DEQ over the applicable groundwater quality cleanup goal for ammonia nitrogen or any other tailings contaminant. In the case of ammonia, DEQ has stated on more than one occasion that the cleanup goal should be the chronic standard, 0.6 mg/l, and not the acute criteria (3.0 mg/l). Detailed rationale for this State determination is provided below. Should the 0.6 mg/l standard be applied, the existing DOE contaminant transport model shows that it would take over 200 years for groundwater near the pile to reach this value (DEIS, Figs. 2−43 and 4−1). As mentioned elsewhere in this document, this case would represent at least 120 extra years of groundwater remediation costs, over and above those predicted by DOE. At an annual operation cost of about $900,000, this represents an increase in the total project cost of more than $108,000,000. In comparison this amount is 65% of the total on-site reclamation cost estimated by DOE ($166,000,000), and certainly needs to be factored into the DEIS decision. On the other hand removal of the pile would forego these possible expenditures for the public.

Response:

See responses to comment #1, item #5; comment #2; and comment #6 regarding compliance standards.

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Document #558 Comment #13 Commentor: Utah Department of Environmental Quality

8B. Surface Water Compliance Standards – Need to Apply Chronic Ammonia Standard (p. S−37) – there is no doubt that DOE’s position is in error. The acute ammonia standard (3.0 mg/l) does not apply to the backwater habitat in questions for several reasons, including (for additional details see discussion below regarding DEIS Section 2.3.1.2):

1) Mixing Zone Premise: Lack of Turbulent Flow – acute standards are applied to surface water quality problems under the assumption that 1) open channel turbulence will provide for a mixing zone to dilute or otherwise reduce the contaminant concentrations from a point source discharge, and 2) the mixing zone will be limited in its dimensions relative to the river’s channel, i.e., less wide than the river channel and limited in longitudinal length (see Utah Water Quality Rules, UAC R317-2-5). However, the backwater areas in question only access the river channel at the habitat’s downstream end. Hence, there is no open channel turbulence inside the backwater area. Instead, the backwater areas are recharged by infiltrating groundwater from the bank, or by river water infiltrating thru the barrier sand bar. Both of these sources of recharge constitute laminar flow and not turbulent conditions. Hence the acute standard is not applicable to an environment where water flow is largely laminar.

2) Avoidance Behavior Assumption – another critical assumption in the application of acute standards to surface water quality problems is that adult fish can avoid the toxicity of the mixing zone by swimming around it (avoidance behavior). However in the case of the backwater areas in questions, larval fish that will be deposited there by the currents do not have the capability to resist moving water. Consequently, they cannot exhibit any avoidance behavior. Given these circumstances only the chronic standard is appropriate, 0.6 mg/l.

3) Exposure Time – the acute standards are designed for a 1-hour exposure to the fish (see Utah Water Quality Rules, UAC R317-6-2, Table 2.14.2). In contrast the chronic standard is designed for a 4-hour exposure period (ibid.). In the case of the backwater areas, the habitat will serve as a nursery for the larval fish in question. Consequently, they will reside there for weeks if not months. As a result, only the chronic standard , 0.6 mg/l, is applicable.

For these reasons, the chronic ammonia-nitrogen standard must be applied to the backwater habitats in question.

Response:

All three items discussed in this comment relate directly to or are directly derived from the issue of the applicability of the acute (3 mg/L) or the chronic (0.6 mg/L) ammonia standard. DOE’s position is that the acute standard applies. The USF&WS concurs that this position is reasonable. See responses to comment #1, item #5; comment #2; and comment #6 regarding compliance standards.

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Document #558 Comment #14 Commentor: Utah Department of Environmental Quality

8B (continued) We understand that water quality monitoring of these backwater areas is challenging, largely due to their transient nature; and that therefore it is preferred to monitor groundwater quality as a means of verifying compliance. We have also concluded that DOE evaluation of the transfer mechanism between groundwater and the backwater areas is incomplete. Errors have also been found in DOE's claim for a 10-fold groundwater to surface water dilution factor. These errors are discussed in detail below.

Until these errors are resolved, and without confirmation on how dilution, dispersion, retardation, or biologic decay will reduce the ammonia concentrations during this groundwater to surface water transition, it is conservative and protective of the environment to apply the chronic (0.6 mg/l) standard as a groundwater cleanup goal.

The application of the chronic ammonia-nitrogen standard, 0.6mg/l, as a groundwater cleanup criteria significantly increases the cost of the total project remediation by $108,000,000 (120 years x $900,000/yr). This additional cost needs to be factored into the total price for the onsite stabilization option. However, these costs could be eliminated from consideration if the pile were moved to another location away from the river.

Response:

The purpose of proposing a ground water cleanup goal, or target concentration, is to evaluate the ground water cleanup alternatives. The target concentration of 3.0 mg/L ammonia in the ground water is not a point of compliance. As explained in the response to comment #6, the ultimate remediation objective would still be to meet all applicable ammonia standards in surface water to be protective of the backwater habitat.

The commentor believes there are errors in the 10-fold dilution factor observed between ground water concentrations and surface water but did not provide specific information to support that opinion. A more recent calculation set completed after preparation of the SOWP and the draft EIS supports the position that a 10-fold dilution factor does apply in most instances where the ground water plume discharges to the backwater areas adjacent to the site. In background locations where elevated ammonia from the Paradox Formation is discharging to the surface water, the 10-fold dilution factor may not apply. This more recent calculation set (DOE 2005a) also provides a more detailed evaluation of the transfer mechanism between ground water and backwater areas and has been added to the references cited in the EIS, Section 2.3.1.2, and made available in the project reading rooms. The annual costs of uncertainties associated with this issue are correctly characterized by the comment and are included in Tables S−1 and 2−33.

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Document #558 Comment #15 Commentor: Utah Department of Environmental Quality

8C. River Migration - Need to Move the Tailings (p. S−41) – we strongly contend with the DOE statement in this section that "…river migration toward the pile would not occur as a catastrophic event but rather gradually in small increments." River channel avulsion is a time dynamic process that can occur very rapidly. History across the world shows river avulsion can be rapid and dramatic. Recent events on the Santa Clara River drainage in southwest Utah also reinforce this conclusion, where over 25 homes were destroyed in a matter of a few hours during a 100+ year flood event.

We also strongly disagree with DOE's preliminary evaluation of costs for the riprap wall planned for construction somewhere between the pile and right river bank, in that it was based on outdated 1-dimensional water velocity and shear force model (1994 Mussetter Engineering Report). More robust 2-dimensional river velocity and shear force modeling has been conducted recently by the USGS, which shows (see Kenney, Figs. 47−49, in Attachment 1, below):

1) Significantly higher river velocities and shear forces will exist in the river's channel and on the right river bank during 100-year and larger flood events, than previously predicted,

2) That these newly predicted forces are large enough to erode medium-sized (1.45−2.91 inch diameter) gravel materials, which are significantly coarser than the fine sands and silts found on the riverbank and adjacent to and under the tailings pile today,

3) Even larger particle sizes can be transported by the river, should the channel be scoured near the West Portal area during a flood event (ibid., Figs. 50, 53, and 56),

4) The physical extent of the erosion prone zones on the right riverbank extend for thousands of feet between the east and west portals to Moab valley; resulting in the need for any riprap wall to be tremendously long and costly both in terms of construction, and long term maintenance.

A copy of this USGS report is included herewith as a formal part of the DEQ comments (see Attachment 1, below).

It is also important to note that the USGS hydrologic modeling is also consistent with geologic evidence found downstream of Moab Valley near Kings Bottom (about 2 miles downstream of the West Portal) where coarse deposits of river terrace gravels are found (Doelling, et.al., p.11 and Plate 1). These geologic deposits attest to fact that the river has experienced extreme velocities in the past that are certainly capable of eroding the fine soils adjacent to and under the tailings pile. Such de-stabilization is a critical failure scenario that must be examined and resolved.

Document #558 Comment #15 - continued

Response:

DOE does not dispute the historical facts cited in the comment. However, DOE's position is that the riprap barrier wall that would be installed if the on-site alternative were selected would effectively mitigate against river encroachment, even were it to occur rapidly. The potential costs for such a mitigation effort have been estimated to range from $0.5 million to $2.0 million, depending on the location and nature of the encroachment, the size of materials required, and the method of construction. This analysis of estimated costs is adequate for the purpose of comparing and selecting an alternative.

DOE has reviewed the recent USGS report and would use the report in its final design of a river migration mitigation plan, including the dimensions of the barrier wall and the riprap size specifications, should on-site disposal be selected in the Record of Decision. The geologic deposits that the commentor refers to are approximately 130,000 to 150,000 years old, are located on terraces between 50 and 100 feet above the modern channel, and attest to the fact that a different river regime existed during the Pleistocene than at present. One would expect river flows during an interglacial warming episode in the Pleistocene to be sufficient to transport bedload gravels and cobbles out of Moab Valley. Currently, the Colorado River is transporting a sand bedload. This is evidenced by the fact that there are no coarse gravel deposits found immediately downstream of the West Portal in the modern river channel indicating active subsidence of the Moab Valley upstream of the portal. During periods of active subsidence, the base level of the valley subsides faster than erosion of bedrock at the Portal, creating a sump for accumulation of coarse sediment. Also see responsible opposing views on river migration in Section 2.6.4 of the EIS.

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Document #558 Comment #16 Commentor: Utah Department of Environmental Quality

8D. Shallow Ground Water Discharge/Matheson Wetlands Preserve (p. S−42) – we agree that at the upper limit of uncertainty that perpetual groundwater remediation may be required for the on-site disposal option. Based on the above discussion, this section should revised to reflect the 120 extra years of active groundwater treatment that the chronic ammonia-nitrogen standard will require. This would result in an increase of more than $108,000,000 in the groundwater management costs for the on-site option.

Response:

See responses to comment #1, item #5; comment #2; and comment #6 regarding the impact of the applicable compliance standard on the estimated duration of requisite ground water treatment.

The commentor requests that DOE revise its description of the consequences of the uncertainty regarding shallow ground water discharge and the Matheson Wetlands Preserve to include remediation time and cost estimates that reflect UDEQ's views regarding both the applicable compliance standard and transport of the shallow ground water plume. DOE's view is that contaminated ground water from the site does not impact the Matheson Wetlands Preserve. The text acknowledges the possibility of an impact to the Preserve as an "upper level of uncertainty." The uncertainty of costs associated with long-term ground water cleanup are addressed in the EIS (Section 2.7.3) through the addition of a 10-percent contingency on the total project estimate and the qualification that the budget estimate is expected to fall within the range of -15 percent to +30 percent. In addition, Section 2.6.4 in the EIS addresses, to the extent possible, the implications of the various uncertainties identified in the EIS, including cost, and the inherent limitations of attempting to precisely quantify them.

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Document #558 Comment #17 Commentor: Utah Department of Environmental Quality

8E. Other Contaminants of Concern (p. S−43) – we also agree that this uncertainty could result in extremely long timeframes to complete groundwater remediation under the on-site stabilization option. To frame the financial impact of this uncertainty the DOE should provide a range of costs that could occur in the event this problem occurs. Certainly, these costs could be compounded on top of the $108,000,000 mentioned above. Even greater costs could accumulate for the on-site option in terms of active groundwater remediation if it is shown that the secondary ammonia pulse, described above, also has to be contained and treated for an additional 440 years.

Response:

With regard to other contaminants of concern, DOE believes that the estimated time required to remediate ammonia in ground water would suffice to remediate other contaminants of concern. As stated in the EIS, DOE presumes that these other contaminants of concern would reach protective levels within the same time frame that it would take for ammonia to reach protective levels because their concentrations are less elevated above applicable cleanup criteria (e.g., surface water standards), the constituents are less widespread, or they occur at elevated concentrations less frequently. Specifically, Section 5.6 of the SOWP (DOE 2003a) describes the distribution of major and minor constituents in the surface water system. The Biological Assessment Screening of Contaminants (Appendix A2) evaluates these surface water data against the background concentrations as well as aquatic benchmark values. This evaluation identifies only the constituents ammonia, manganese, copper, uranium, and sulfate as being contaminants of potential concern.

Section 2.3.1.2 has been expanded to more fully address this issue. Site-specific modeling of the tailings' long-term seepage indicates that seepage rates will decrease 25-fold from their current rate of approximately 20 gpm (Figure 6−3, Table 6−3 of the SOWP) to the predicted long-term flux of 0.8 gpm. This 25-fold decrease in volumetric and contaminant mass flux from the tailings, coupled with the 10-fold average dilution of ground water observed in surface water concentrations, is anticipated to result in decreases in contaminant surface water concentrations below aquatic benchmark and/or appropriate water quality standards without any geochemical transformations beyond simple dilution, which are likely to occur as well. For example, the maximum observed copper concentrations in the surface water adjacent to the site range from approximately 5 µg/L to 14 µg/L, while the Utah water quality criteria is 12 µg/L. Similarly, maximum observed manganese concentrations in surface water exceed the aquatic benchmark value of approximately 0.01 mg/L in only five locations, with the all-time maximum of 11.5 mg/L (it should be noted that natural manganese background ground water concentrations of 19 mg/L to 38 mg/L have been observed). The maximum observed uranium surface water concentration is approximately 5 mg/L, roughly 100 times the aquatic benchmark of 0.04 mg/L, and the maximum observed sulfate surface water concentration is approximately 14,000 mg/L, roughly 28 times the upper range of background sulfate concentrations (439 mg/L). Therefore, there exists a reasonable assurance that the resulting 250-fold decrease in future surface water concentrations predicted from decreased tailings seepage coupled with ground water dilution through mixing with surface water will result in long-term protective concentrations for all constituents of concern.

Document #558 Comment #17 - response continued

However, DOE acknowledges in the EIS that there is uncertainty in this assumption due to factors such as differences in solute transport and sorption mechanics. DOE acknowledges and agrees with USF&WS and EPA that the assumption is relatively untested and warrants further investigation. In its Biological Opinion (EIS, Appendix A3), USF&WS stipulates that as a reasonable and prudent measure, DOE, in consultation with USF&WS, will develop data quality objectives within 6 months of the Record of Decision and will develop a water quality study plan within 18 months of the finalization of the Record of Decision that determines, among other things, the validity of the assumption that by reducing concentrations of ammonia, the other constituents of concern (manganese, sulfate, uranium, copper, and selenium) will also be reduced to protective levels.

With regard to the time required to remediate ammonia, see responses to comment #1, item #5; comment #2; and comment #6.

With regard to a possible secondary ammonia pulse due to a leached salt layer, see response to comment #1, item #3.

With regard to the suggestion that DOE should provide a range of costs that could occur in the event that remediation of other contaminants of concern takes longer than estimated, Section 2.6.4 has been added to the EIS which addresses, to the extent possible, the potential implications should the DOE view on this issue be in error. If applicable protective criteria (for ammonia or for other contaminants of concern) could not be achieved or would require substantially longer than DOE estimates, DOE recognizes that the duration of ground water remediation, especially under the on-site disposal alternative, could be substantially longer than estimated in the EIS and that the estimated $906,000 per year cost of ground water remediation would continue beyond the currently estimated 75 to 80 years.

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Document #558 Comment #18 Commentor: Utah Department of Environmental Quality

8F. Limited-use Aquifer (p. S−44) – we agree that groundwater cleanup at this site should focus on protection of the nearby backwater habitat in the Colorado River. However, we take exception to the DOE statement that "Active ground water cleanup beyond what is currently projected is not likely to be required for the protection of aquatic species." Based on above DEQ comments, it is premature to reach this conclusion in that: 1) the chronic ammonia-nitrogen standard (0.6 mg/l) is applicable to the backwater habitat and not the acute standard (3.0 mg/l), and 2) DOE's arguments about the assumed 10-fold groundwater to surface water dilution factor have been found to contain errors. Lacking this evidence to demonstrate how a higher groundwater concentration would allow the backwater to meet the chronic standard (0.6 mg/l), DOE must apply the chronic standard as the groundwater cleanup goal.

Response:

See responses to comment #1, item #5; comment #2; and comment #6, regarding the applicable compliance standard.

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Document #558 Comment #19 Commentor: Utah Department of Environmental Quality

8G. Salt Layer Migration – Need to Remodel Contaminant Transport (p. S−45) – the discussion here fails to describe the implications for the ammonia salt layer in the tailings on the DOE contaminant transport model, which was used to justify the 75−80 year groundwater cleanup estimates. Review of the DOE SOWP (pp. 6−11 and 12, and 7−23) show that DOE's contaminant transport model assumed a constant tailings pore fluid ammonia concentration (1,100 mg/l). However, by DOE's own estimates, an ammonia salt layer near the top of the tailings pile will solubilize and be transferred to the water table by infiltration seepage thru the on-site cover system. In turn, this seepage will then cause a 16-fold increase in the ammonia concentrations that arrive at the water table (dissolved ammonia-nitrogen = 18,000 mg/l). Unfortunately, this step function increase in the source term concentration was not simulated in the DOE contaminant transport model (DOE SOWP, p. 7−23). Hence, the model did not represent actual field conditions anticipated.

Using DOE's estimates, this step increase in the ammonia source term concentration would arrive at the water table about 1,094 years after cover construction (SOWP, pp. 6−11 and 12 and Fig. 6−3). This means that the ammonia break-thru curve in the DEIS (Fig. 2−43), does not represent the long-term performance of the on-site option, in that the ammonia loading on the water table will increase at about year 1,094, and shortly thereafter could cause a spike increase in the predicted groundwater and backwater habitat concentrations. Further, these same DOE estimates also show it would take about 440 years for the cover system infiltration to leach out the ammonia salt layer (DOE SOWP, p. 6−11). As a result, the DOE model should have simulated tailings pile infiltration and contaminant transport for a minimum of at least 1,500 years. Instead, the DOE model only simulated 200 years of system performance (DEIS, Fig. 2−43 and SOWP, p. 7−30 and Fig. 7−17).

As a result of these findings it is clear that DOE's contaminant transport predictions are prejudiced and biased; leaving DOE's claim unsupported, i.e., that only 75−80 years of active groundwater remediation are required. In reality, additional contaminant transport modeling is required to evaluate actual field performance of the on-site remediation option thru a time span of at least 1,500 years. Given these circumstances, it is reasonable to expect that new contaminant transport modeling would show that the onsite option would allow groundwater to:

1) Achieve the 0.6 mg/l chronic ammonia-nitrogen standard during the first 200 years, only to be exceeded again at about 1,100 years when the ammonia salt layer pulse reaches the water table, and

2) Thereafter it could take as long as 440 years for this ammonia pulse to be dissipated from the groundwater system, as the ammonia salt layer in the tailings pile was leached out.

Under this scenario, active groundwater remediation would be required not for 80 years, or 200 years, but for possibly 640 years. As a consequence, the total cost for active groundwater remediation would be $576 Million (640 years x $900,000/yr), and total remediation cost for the entire on-site stabilization project would then be $749.5 Million [$248.8 Million (see DOE DEIS Table 2−35) – $75.3 Million (80 years of active groundwater cleanup) + $576 Million (640 years of active groundwater remediation)]. Under these circumstances relocation would be a much more attractive option.

Document #558 Comment #19 - continued

Some may argue that evaluation of a 1,500 year timeframe is excessively long, given that the EPA regulations for Title I projects only require a 200 – 1,000 year evaluation (40 CFR 192.02). However, the National Academy of Science (NAS) already ruled on this issue, as follows (6/11/02 National Academy of Science, Board on Radioactive Waste Management Report to DOE, p. 3):

> "II DOE's decision-making process should recognize the connections and potential tradeoffs between short- and long-term actions.
>
> The committee suggests that the ultimate objective at the Moab Site should be to implement remediation and management measures that have the best reasonably achievable probability of being protective of human health and the environment *for the duration of the hazard*, taking into account relevant economic and societal factors. Federal regulations (40 CFR 192) adopt 1000 years as the design objective for the maintenance of human isolation of mill tailings from the environment. The regulations require that this objective be met "to the extent reasonably achievable," and set a lower bound for control of "at least" 200 years. These are ambitious goals, even though they fall far short of the full duration of the hazard.
>
> Lower levels of remediation in the near term typically leave greater residual long-term hazards, which may increase the need for, the importance of, and the costs of long-term actions. *The committee recommends that DOE assess each alternative for disposition of the Moab pile on the basis of its entire life-cycle,* including the demands for long-term institutional management (LTIM) actions, where LTIM comprises the total system of protection, including contaminant reduction, contaminant isolation, and long-term stewardship. Thus, such an assessment would specifically include consideration of the residual risk when the near-term remediation actions at the site are complete, the LTIM measures required, the likely duration of these measures, the consequences of the failures of such measures, and the total social costs expended. DOE should consider all of these factors in establishing the balance between near-term cleanup and long-term measures, as well as in designing the LTIM measures, themselves. *Long-term considerations* do not necessarily outweigh short-term concerns (e.g., cost and remediation risk), but they *should be identified, evaluated, and any tradeoffs explicitly identified* and considered as part of the decision." (emphasis added)

Based on this NAS guidance, DOE should have completed the contaminant transport analysis for a period of at least 1,500 years. Since this was not done, the DOE contaminant transport analysis failed to evaluate the problem for the "… full duration of the hazard." Further, the DOE evaluation also failed to fully assess the "… long-term considerations … and any tradeoffs explicitly identified … as a part of the decision."

However, should DOE decide to move the tailings to a new disposal site away from the river, this issue would be mute.

Document #558 Comment #19 - continued

Response:

DOE agrees with the commentor that the salt layer would not be an issue if DOE decided to relocate the pile.

See responses to comment #1, item #3, regarding the salt layer. See responses to comment #1, item #5; comment #2; and comment #6 regarding the appropriate compliance standard.
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Document #558 Comment #20 Commentor: Utah Department of Environmental Quality

9. Major Conclusions: Comparable Groundwater Remediation Costs (p. S−47) - we strongly disagree with the DOE conclusion that the groundwater remediation duration and costs would be identical regardless the tailings cleanup option selected. As discussed above the apparent comparability is an artifact of the arbitrary groundwater cleanup standard selected by DOE (3.0 mg/l acute ammonia nitrogen). Application of the more appropriate chronic ammonia-nitrogen standard, 0.6.mg/l, as a groundwater cleanup criteria could result in an increase of 120 years of additional groundwater treatment, with an associated cost of about $108,000,000. Further, contaminant transport evaluation of the secondary ammonia pulse from leaching of the ammonia salt layer in the upper reaches of the tailings pile could also dramatically increase the costs for active groundwater remediation for the on-site option, by as much as $576 million more. These two factors combined would dramatically alter DOE’s conclusion, and the on-site stabilization option would become significantly more expensive than any of the off-site alternatives.

Response:

See responses to comment #1, item #5; comment #2; and comment #6 regarding the applicable compliance standard. See response to comment #1, item #3, regarding the salt layer.
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Document #558 Comment #21 Commentor: Utah Department of Environmental Quality

10A. Ground Water Remediation Standard Applied – here the DOE states that "USFWS agrees with DOE that the target goals that DOE has selected would be protective of aquatic species in the Colorado River". However, what was not said, is that this agreement is conditioned upon unsubstantiated affirmations from DOE that the proposed groundwater cleanup goal (3.0 mg/l ammonia-nitrogen) will allow backwater habitat water quality conditions to meet the 0.6 mg/l chronic ammonia nitrogen standard. The fact that DOE's contaminant transport model failed to analyze the secondary ammonia pulse that will result from leaching of the ammonia salt layer in the upper portion of the tailings pile further detracts from any confidence in the DOE's claims that the backwater areas will achieve the 0.6 mg/l chronic ammonia standard.

Further, DOE has not completed any technical studies to confirm if its dilution factor claim can actually be met in the backwater habitat. Additional discussion follows below that explains why DOE's assumptions on this issue are weak and without merit.

Recently we have become aware that the USFWS will stipulate conditions in its upcoming Biologic Opinion to require DOE to positively demonstrate that the groundwater remediation system will allow water quality conditions in the backwater area to meet the 0.6 mg/l chronic ammonia-nitrogen standard (personal communication, Henry Maddux, USFWS, SLC).

Until a verifiable technical demonstration is made, uncertainty exists that DOE can successfully meet the required water quality conditions and prevent takings of endangered fish with the on-site stabilization option. Should DOE be unable to successfully complete this demonstration, the possibility exists that the time required for groundwater remediation will increase by more than 120 years. Under these circumstances a dramatic difference will exist between the on and off-site remediation options, and it could take more than 200 years of active groundwater remediation to cleanup the habitat, should the pile remain where it is. This would result in an increased cost to the total remediation project of more than $108,000,000. Comparatively, this value is more than 65% of the total cost for the on-site stabilization option, and therefore deserves significant evaluation and study.

However, this issue is mute should DOE select eliminate the contaminant source term by relocating the tailings pile.

Response:

DOE agrees that the issues raised in this comment would be moot if DOE decided to relocate the pile.

See responses to comment #1, item #5; comment #2; and comment #6 regarding the applicable compliance standard.

See response to comment #1, item #3, regarding the salt layer.

Document #558 Comment #21 - response continued

In addition, in its Biological Opinion (Appendix A3 of the EIS), the USF&WS states the following: “The FWS has considered all of UDEQ’s comments in our analysis of the effects to listed species associated with ground water remediation and we agree that many warrant further study (see Incidental Take Statement). Based on our review of the available information, and with recognition that there are uncertainties in both DOE’s and UDEQ’s analyses, the Service has determined that DOE’s premise that 3 milligrams per liter (mg/L) ammonia in ground water will result in protective concentrations *in all surface water habitats* presents a reasonable approach to the problem” (emphasis added).

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Document #558 Comment #22 Commentor: Utah Department of Environmental Quality

10B. River Migration – this controversy is more than a professional difference of opinion. The NAS has already established how critical this issue is to the fate of this site and protection of nearby natural resources, as follows (6/11/02 National Academy of Science, Board on Radioactive Waste Management Report to DOE, pp.3−4):

> "III. DOE should critically examine important assumptions and conclusions in its analyses of the two primary alternatives, examine the likelihood that they might be invalid over the relevant time frames, and reassess the risks in this new light.
>
> The future risks from the stabilize-in-place alternative will depend on the long-term stability of the pile, the durability of the cover system, the longevity of society's memory regarding hazards at the site, the distribution and extent of contamination in the subsurface, the ability of engineered barriers to protect against movement of the course of the Colorado River toward the pile, and the persistence of organizational capabilities to respond to failures in the pile's integrity. In the current analysis, these issues are addressed by generally assuming that all engineered and natural systems will work as expected and that institutional memory will endure. The potential for these assumptions to be wrong, and the consequences if they are, need to be considered in more detail. These matters are discussed in Section V of the body of the committee's report.
>
> An example of an important assumption that should be reviewed at the Moab Site is DOE's acceptance of the U.S. NRC's finding that the risks that the Colorado River will intercept and carry away a portion of the mill-tailings pile are small and that this eventuality can be addressed by engineered measures. *In contrast, it is the committee's view that it cannot be assumed that the course of the Colorado River will remain in its current position over the next 1000 (or more) years*. While one cannot predict the timing of river migration (over the coming millennia or in the next several decades), *the committee sees it as a near certainty that the river's course will run across the Moab Site at some time in the future, unless engineered barriers prevent it from doing so.* In addition to appropriate consideration of the probability that the river will change course, the consequences if such an event were to occur have been examined only superficially. Accordingly, DOE should assess the risks—both probabilities and consequences—associated with river-pile interactions over time. If the stabilize-in-place option is selected, explicit consideration of this failure scenario is necessary, and the risks may warrant a plan for dealing with such failures." (emphasis added)

After review of these NAS guidelines it is apparent that DOE made no effort to critically examine the previous Atlas and NRC position that river migration was of no consequence to the project. To this end, Utah DEQ and the Environmental Protection Agency (EPA) commissioned the USGS to conduct new river water velocity and shear force modeling to better assess the erosive forces that could interact with the tailings pile. This new study also provided an opportunity for a more robust, 2 and quasi-3-dimensional analysis of erosion potential; which represents a dramatic improvement over the simplistic and antiquated 1-dimensional model used previously by Atlas (1994 Mussetter Engineering Report).

Document #558 Comment #22 - continued

In light of the NAS charge above, the need for an independent evaluation is clear in that the simplistic 1-dimensional model was performed for a client who had a conflict of interest to see the pile remain in place. Certainly due diligence and professional responsibility would indicate that an independent evaluation of the former model (1994 Mussetter Engineering Report) is in order. To do otherwise would be irresponsible.

The need for this new evaluation was obvious, in that channel avulsion and river migration is a time dynamic process that can be rapid and dramatic, especially for a large river system like the Colorado River. Recent flooding on the Santa Clara River branch of the Colorado River drainage is direct evidence of this possibility, where more than 25 homes were destroyed in a few hours. DOE’s claims to the contrary – that river migration is a slow and passive process - are in direct contradiction with the knowledge and experience of common citizens who live near large rivers. Common sense tells us that periodic, long term monitoring and mitigation cannot guarantee that a catastrophic flood event won’t erode and destabilize the pile in the future.

The new USGS hydrologic modeling has independently verified the river’s potential to erode the right river bank. This new work is based on local topographic information provided in part by DOE, detailed site specific measurements of river channel bathymetry, and robust 2-dimensional river water velocity and shear stress simulations under 100 year and higher river flow rates (Kenney, Figs. 47−49, see Attachment 1, below). This new USGS modeling shows how the river can transport medium-sized (1.45−2.91 inch diameter) gravel at water velocities and shear forces found in the river’s channel during 100-year flood conditions (Kenney, Fig. 47). Even larger sized sediment can be carried under higher river flow conditions (ibid., Figs. 48−49), or if channel scouring were to occur near the West Portal (ibid., Figs 50, 53, and 56). Certainly it is clear that if the Colorado River can transport sediments of this size, it could easily erode the fine silts and sands found on the riverbank and under the tailings pile. A copy of the USGS modeling report is included herewith as a part of DEQ’s comments on the DEIS, see Attachment 1, below.

Furthermore, the recent USGS modeling is consistent with nearby geologic evidence. Large deposits of river terrace gravels are found near Kings Bottom, about 2 miles downstream of the West Portal. These deposits are geologic evidence that the Colorado River has experienced high water velocity, shear force, and erosive power in the geologic past (Doelling, et.al., p. 11 and Plate 1). Therefore, it is evident that the river’s potential to erode the riverbank and undermine the tailings pile is real, and must be accounted for and resolved in DOE’s decision-making process for determination of the pile’s ultimate fate.

Response:

The NAS report to the Department, dated June 11, 2002, stated, “While one cannot predict the timing of river migration (over the coming millennia or in the next several decades), the committee sees it as a near certainty that the river’s course will run across the Moab site at some time in the future, unless engineered barriers prevent it from doing so.” The Department agrees with the NAS conclusion that at some point in the future, especially considering geologic time, the river will cross the Moab site. In Sections 2.1.1.3 and 2.1.1.4 of the EIS, the Department proposes engineering controls to resolve this issue for the near term (200 to 1,000 years).

Also see response to comment #1, item #1, regarding river migration.
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Document #558 Comment #23 Commentor: Utah Department of Environmental Quality

11. Section 1.4.1: On-Site Disposal Alternative (p. 1−7) – based on recent USGS river velocity and shear force modeling, flood protection will be required not only at the base of the tailings pile, but along extensive segments of the right river bank in Moab Valley. This same modeling shows significant erosive conditions will exist during a 100-year flood event across long areas adjacent to the mill site (Kenney, Fig. 47). As a result, should the DOE stabilize the pile in place, these vulnerable river bank areas will require extensive riprap protection to prevent the existing channel from migrating and undermining the tailings embankment. This will likely require a riprap wall that is 1,000's of feet long. Long-term maintenance of such a long erosion barrier would also be significant project cost. However, relocation of the tailings would eliminate the need for such costly erosion protection.

Response:

See response to comment #1, item #1, regarding river migration and engineering controls. The recent USGS study is addressed in Section 2.6.4 of the EIS.
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Document #558 Comment #24 Commentor: Utah Department of Environmental Quality

12A. Failure to Recognize State Jurisdiction for Groundwater – we agree with DOE's previous statements that Residual Radioactive Material (RRM) at Title I facilities is not defined as a contaminant under the Federal Clean Water Act or the EPA National Pollutant Discharge Elimination System (NPDES program), and is therefore not subject to this jurisdiction (3/17/04 DOE Responses, Chapter 2, Comment 40). However, this federal law and regulation apply only to navigable waters of the United States. Conversely, groundwater appropriations and quality issues are the jurisdiction of the States. Consequently, the State of Utah has authority over sources of groundwater pollution. Using this State authority, the Utah Department of Environmental Quality (DEQ) has classified the shallow aquifer at the Moab Tailings site as a Class IC aquifer, that needs protection in order to sustain a nearby wildlife habitat, that being the backwater area which is fed by groundwater on the nearby banks of the Colorado River. The DOE needs to recognize the State's authority and partner with DEQ to find a solution to protect the nearby water resources. Cooperation to find a solution to this problem, will avoid the need for escalated State action.

Response:

DOE is proposing to remediate ground water under 40 CFR 192. Regardless of whether surface remediation involved on-site or off-site disposal, active remediation is proposed for contamination remaining in ground water beneath the Moab site to prevent further degradation of surface water quality. This active remediation would be conducted in conjunction with the application of supplemental standards provided under 40 CFR 192. The application of supplemental standards is reasonable because the natural background water quality in the alluvial aquifer is poor, as evidenced by TDS concentrations that range from a low of 677 mg/L to over 97,000 mg/L. Because ground water in the major portion of the aquifer has a TDS content exceeding 10,000 mg/L, the aquifer meets the definition of a limited-use aquifer as described in EPA's Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy (EPA 1988).

The focus of active remediation would be on preventing contaminated ground water from reaching potentially sensitive surface water areas, which is consistent with the intent of UDEQ classifying the ground water as a Class IC aquifer. DOE recognizes the need to work with the State of Utah to comply with EPA's UMTRCA standards to meet the intent of the Class IC aquifer to protect nearby water resources. Protective levels and monitoring methods to demonstrate compliance with surface water standards would be conducted in accordance with the USF&WS Biological Opinion and the Record of Decision.

However, it should also be noted that a Class IC aquifer, as defined by the State of Utah ground water classification system, requires TDS concentrations to be less than 500 mg/L. Therefore, the basin-fill aquifer beneath the site does not meet the state's requirement for a Class IC aquifer. The aquifer does meet the state's classification for a limited-use aquifer, which is an aquifer with a TDS concentration greater than 3,000 mg/L. As stated in the EIS (Section 3.1.6), the volume of 3,000 mg/L or less TDS represents less than 3 percent of the total volume in the basin-fill aquifer. All of the fresh water with less than 3,000 mg/L TDS occurs upgradient of the tailings pile.
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Document #558 Comment #25 Commentor: Utah Department of Environmental Quality

12B. High Uncertainty for Cost Estimates for Remediation – the time span estimated for cleanup of the polluted groundwater on the Moab Tailings site is highly uncertain. The DOE's conceptual model for the groundwater has only focused on shallow contamination. Little is known about the local groundwater – surface water interaction. Further, the DOE presentation does not acknowledge deep groundwater contamination created by high driving heads during historic operation of the tailings pile. Research on freshwater equivalent head done by the University of Utah has shown that it is possible for this deep contamination from the tailings pile to travel under the river (Gardner and Solomon, pp.14−15 and Fig. 7). The ultimate fate of this deep contamination is not known, nor have the potential receptors of this deep pollution been identified.

Geochemical evidence regarding Oxygen-18 / Oxygen-16 ratios ($\delta^{18}O$) in groundwater on both sides of the river has also been presented to DOE by the University of Utah (Gardner and Solomon, pp. 18−20, Table 5 and Figs. 15 and 16). This evidence also shows how certain wells found in the Matheson Preserve have a $\delta^{18}O$ signature that is indicative of the lower elevation recharge from the Glen Canyon Group found in DOE wells near the tailings pile. As a result of these University findings it is clear that the Colorado River does not form the hydraulic barrier that it was once thought to be, and that deep groundwater from the DOE site can travel under the river and affect the Matheson Preserve. To date, DOE has refused to recognize these important data. Such uncertainty in the local groundwater – surface water relationship suggests the site is complex and not yet well defined hydrologically. Lacking a complete characterization of the local hydraulics, one can only conclude that the total cost and time span estimated by DOE for groundwater remediation are highly speculative, and deserve further study and determination.

Response:

DOE's conceptual model for ground water does acknowledge deep ground water contamination in the brine zone created during historic operations. It was DOE that first acknowledged the nature and extent of the deep ground water contamination in the brine zone beneath the tailings pile and proposed a new conceptual model for the site in the SOWP. Conceptual models presented by previous investigators were unaware of the deeper contamination. Figure 3−8 in the EIS shows DOE's proposed conceptual model, which illustrates the deep ammonia source in the brine zone, the legacy plume, and seepage of ammonia from tailings pore fluids. Section 3.1.6.3 of the EIS describes the latest conceptual model and demonstrates that DOE acknowledged the deeper contamination.

The deep ammonia source was incorporated into the 3-dimensional computer flow and transport model by first determining the rate at which the ammonia will migrate into the freshwater system. This was determined using the findings from 2-dimensional density-dependent modeling presented in Appendix D of the SOWP. Results of the 2-dimensional modeling indicated that the flux of ammonia across the saltwater interface would result from both advective and dispersive processes and would be transient in nature. The temporal decline in ammonia fluxes across the interface would vary depending on observed ammonia concentrations at the interface. To account for changes in ammonia influx due to concentration variations, a mathematical relationship between the ammonia mass flux from the deep brine to the overlying freshwater system as a function of time was developed. This mathematical relationship, presented in Figure 7−13 of the SOWP, was incorporated into the 3-dimensional model to approximate the changes in flux over time. As a result, historic ground water contamination found below the saltwater interface will

Document #558 Comment #25 - response continued

continue to contribute contaminants to the freshwater system and backwater areas for approximately 50 years.

The commentor states that University of Utah research on freshwater equivalent head has shown that it is possible for this deep contamination from the tailings pile to travel under the river (Gardner and Solomon 2003). This issue is now addressed as a responsible opposing view in Section 2.6.4 of the EIS, which includes the following points:

Gardner and Solomon's contention that deeper ground water within the brine zone flows southeastward and under the river from the Moab site toward the City of Moab is based on the calculation of equivalent freshwater heads in brine at seven different locations at a uniform elevation of 1,190 meters above mean sea level. Unfortunately, none of the wells used for this analysis has its screen centered at the 1,190-meter elevation; consequently, interpolation and/or extrapolation techniques are used to estimate equivalent freshwater heads at this altitude. Because these calculations are carried out over vertical distances that range anywhere from about 1 meter to more than 10 meters (3.3 feet to more than 33 feet), the resulting heads should be considered very approximate and highly uncertain. In fact, some of the computed heads could be in error by 0.5 meter or more. Because Gardner and Solomon (2003) base much of their reasoning on computed freshwater heads that differ by as little as 0.2 meter over a distance of one-third mile, there appears to be little reason to place any significant confidence in their conclusions.

It is not clear why Gardner and Solomon (2003) chose to base their freshwater head analysis solely on wells screened within brine. As long as equivalent freshwater heads are calculated at the common elevation of 1,190 meters above mean sea level, the heads computed for wells screened in non-brine ground water can also be used to discern potential flow directions.

Applying this hydraulic principle to additional wells (N2, N3, N4, N5) that lie east of the wells included in the potentiometric surface assessment (i.e. showing potential water flow) by Gardner and Solomon results in computed equivalent heads that are approximately equal to or greater than 1,207 meters above mean sea level. Since all of the heads computed by Gardner and Solomon and posted in their Figure 7 are less than 1,207 meters, inclusion of these additional heads in the analysis suggests that ground water tends to flow westward toward the river, not southeastward.

A few defensible findings can be taken from the equivalent freshwater head calculations conducted by Gardner and Solomon (2003), but none of these supports their contention that contaminated water flows under the river. At those locales where deep well nests were installed (i.e., BL1, BL2, and BL3), a clear upward component of flow in the brine is indicated. This effect is predicted by the hydraulic principles of density-dependent ground water flow near a river receiving brine discharge. In addition, the equivalent freshwater heads calculated by Gardner and Solomon in wells located close to the river decrease with flow length along the river. This result is also expected since the average river surface elevation also decreases with distance downstream, but it does not indicate that brine water passes under the river from the Moab Project site to the Matheson Wetlands Preserve.

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Document #558 Comment #26 Commentor: Utah Department of Environmental Quality

13. Section 2.0: Groundwater Remediation paragraph (p. 2−4) – we agree that interception of the contaminated groundwater is essential to prevention of it polluting nearby surface water. However, the current remediation system discharges its contaminants back to the top of the tailings pile. Thereby simply relocating the contaminant source term to an upstream location where it can be leached again and returned to the aquifer for renewed or repeated groundwater contamination. This "closed loop" system would appear to have the potential to exacerbate the ammonia salt layer problem and the secondary ammonia leachate pulse described above. Any long term remediation solution must break this "closed" loop approach and remove and prevent the contamination from being re-introduced into the shallow aquifer.

Response:

The current interim action ground water remediation system is not a "closed loop." Contaminated ground water from the interim action well field is pumped to the treatment system on top of the pile. The treatment on top of the pile consists of two separate components: an evaporation pond, which is lined with high-density polyethylene (HDPE) to prevent the ground water from returning to the aquifer, and a spray evaporation system. Ground water from the evaporation pond is delivered to thousands of sprinklers over a 28-acre area on top of the tailings pile, sprayed, and evaporated to dryness to prevent any reintroduction into the aquifer. The evaporation pond and sprinkler system are not part of the long-term remediation since they will be removed as part of either the on-site disposal alternative or off-site disposal alternative.
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Document #558 Comment #27 Commentor: Utah Department of Environmental Quality

14. Section 2.1.1.2: Contaminated Soil, Vegetation, and Debris (p. 2−11) – prior to actual cleanup of site soils, please coordinate determination of background radium-226 concentrations with DEQ.

Response:

Determination of natural background radium-226 concentrations is provided in DOE's Verification and Excavation Control Procedure (DOE 2005b). NRC has concurred with this procedure, which is available for UDEQ review.
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Document #558 Comment #28 Commentor: Utah Department of Environmental Quality

15. Section 2.1.1.4: Site Reclamation – Need for Longer Riprap Wall (p. 2−14) – as discussed above, the recent USGS river velocity and shear force modeling indicates a 100-year flood will cause widespread erosion of the riverbank in Moab Valley (Kenney, Fig. 47). Higher river flows and/or channel scour near the West Portal will only increase the potential for this erosion (ibid., Figs. 48−49, and 50, 53, and 56, respectively). Consequently, the riprap wall proposed in Fig. 2−3 will have to be greatly increased in length and rock diameter to protect the tailings pile from future erosion. This would add significantly to the project cost. However, relocation of the pile would make mute the need for more robust riprap protection.

Response:

See response to comment #1, item #1, regarding the riprap wall and its cost.
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Document #558 Comment #29 Commentor: Utah Department of Environmental Quality

16. Section 2.1.3.1: Borrow Material Standards and Requirements (pp.2−19 thru 22) – recent river velocity and shear force modeling by the USGS shows that under the possible maximum flood conditions (Q_{pmf}) that the tailings pile would be inundated to a depth of 25 feet above the toe of the pile (Kenney, Figs. 16 and 19). This same modeling also illustrated how the southeast corner of the pile would provide a restriction to river flow that would significantly increase water velocity and generate back-eddies next to the pile and across the mill site (ibid., Figs. 32 and 33). Consequently, if the pile is left in place, significant quantities of very large diameter riprap will be required along vast areas of the east and south facing sideslopes. Further, this protective blanket will need to extend vertically more than 25 feet above the toe of the tailings pile. The size of the riprap required and the quantity of the available borrow sources needs to be carefully evaluated in light of these performance requirements. However, should the pile be moved away from the Colorado River, this cover design specification need not be as rigorous, and would be much less costly to construct.

Response:

In the EIS, DOE acknowledges the potential for the pile to be inundated during flood events and quantifies the impacts that could result from such inundation (Section 4.1.1 and 4.1.3). If the on-site disposal alternative were selected, the side slopes would be armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures are described in Section 2.1.1.4 of the EIS and in the response to comment #1, item #1.

These measures would further reduce the already highly unlikely chance of a catastrophic failure of an on-site disposal cell. If the on-site disposal alternative were selected, DOE would use the USGS data on potential flood velocities that might occur at the pile for the final design of the riprap side slopes and the barrier wall.
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Document #558 Comment #30 Commentor: Utah Department of Environmental Quality

17. Section 2.1.4: Monitoring and Maintenance (p. 2−24) – with regards to riprap protection, we take exception with the statement that "… if an erosion problem were observed, the eroded area would be remedied by re-filling the area." The erosive power of the Colorado River is significant. As demonstrated by the USGS river velocity and shear force modeling, large areas of the right riverbank are vulnerable even during 100-year flood events (Kenney, Fig. 47). Several events of this magnitude should be expected in the DOE design analysis, which is required to consider a 200 – 1,000 year period. Larger flood events and channel scour near the West Portal would only exacerbate the erosive power of the river (ibid., Figs. 48−49, and 50, 53, and 56, respectively).

In addition, DOE has overlooked how river channel avulsion is a rapid and catastrophic process that can drastically change channel location and geometry during acute runoff. Under these circumstances it may not be feasible or possible to re-fill these areas in a timely manner to control acute erosion. However, this issue becomes mute if the pile was relocated.

Response:

Section 2.1.4 has been clarified to indicate "soil" erosion. Based on the size of riprap, no erosion of that medium is anticipated. As stipulated in Section 2.1.4, the riprap size (12 to 36 inches) would be sufficient to withstand the erosional forces identified in the USGS report. See responses to comment #29 and to comment #1, item #1, regarding the engineered barriers.
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Document #558 Comment #31 Commentor: Utah Department of Environmental Quality

18. Section 2.2.5.1: Reference Disposal Cell (p. 2−77) – DOE should ensure the design of the topslope soil / rock admixture and the sideslope riprap layers are easily constructible. Following NRC guidance, the thickness of such layers should be at least 2-times the average particle diameter (D_{50}).

Response:

The final cover design would consider site-specific performance requirements, aesthetics, and other factors. In addition, the final cover design would meet the requirements promulgated in 40 CFR 192 and would be required to receive review by and concurrence from the NRC. See responses to comments #29 and #30 and to comment #1, item #1, regarding the engineered barriers.
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Document #558 Comment #32 Commentor: Utah Department of Environmental Quality

19. Section 2.2.5.2: White Mesa Mill Disposal Cell and Figures 2−36 and 37 (pp. 2−78 thru 81) – several issues need to be addressed for this option, including:

A. State Regulatory Position: Groundwater Protection – Utah DEQ is an Agreement State under the U.S. Nuclear Regulatory Commission (NRC) 11e.(2) program for regulating uranium mills. Utah's uranium mill regulations, found in UAC R313-24-4(1)(b) require the mills to comply with the State Ground Water Protection Rules (UAC R317-6). By this means, uranium mill operators are required to comply with State requirements for groundwater quality protection.

Response:

Section 2.2.5.2 and Section 7.3 have been revised to recognize the State of Utah's new regulatory authority over current and future IUC operations of the White Mesa Mill.
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Document #558 Comment #33 Commentor: Utah Department of Environmental Quality

19B. BAT Design Standards, Dry and Wet Cells - it is presumptive that only a clay liner would be necessary under the “dry” tailings disposal cell at the International Uranium Corporation (IUC) at White Mesa. Under the Utah Ground Water Quality Protection Regulations (UAC R317-6-1.25) this new disposal cell would be an new facility, and thus subject to the requirements of Best Available Technology (BAT) under these State rules [UAC R317-6-6.4(A)]. This would likely require double flexible membrane liners (FML) and leak detection, and thus greatly increase the cost of the project. Because the proposed cover design is integrated with other upgradient disposal cells, the “dry” cell cover system would also have to be carefully examined in this permitting process to ensure it met the performance standards already established in the facility’s Ground Water Quality Discharge permit.

The same is also true of the “wet” cell proposed, in that a single FML also fails to meet the BAT design requirement for liner systems. Again, because a FML is used in the under-liner system, a FML will also be required in the cover system to meet State BAT design requirements. These changes will increase the cost of the White Mesa disposal option.

Response:

Section 2.2.5.2 states that the liner design for the White Mesa Mill alternative is conceptual and is only intended to establish a reasonable basis for evaluating environmental impacts. In addition, Section 2.6 states that a specific license amendment, approved by the State of Utah, would be required to IUC’s license before design or relocation of the tailings could take place. As with the cover design, the final liner design would consider site-specific performance requirements, all appropriate state requirements, and other factors and would require full review and concurrence by the State of Utah. Best Available Technology would be considered during development of the actual cover design. The uncertainty of costs associated with differences between a conceptual design and a final design are addressed in Section 2.7.3 through the addition of a 10-percent contingency on the total project estimate and the qualification that the budget estimate is expected to fall within the range of -15 percent to +30 percent.
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Document #558 Comment #34 Commentor: Utah Department of Environmental Quality

19C. Radioactive Materials License Amendment Required - because Utah is now an Agreement State under the NRC Title II program, IUC would also have to amend its Radioactive Materials License to accommodate this disposal option at White Mesa. Said action would be in addition to the issuance of a State Construction Permit and modification of the existing Ground Water Quality Discharge Permit for the facility.

Response:

Section 2.2.5.2 and Section 7.3 have been revised to recognize the State of Utah’s new regulatory authority over current and future IUC operations of the White Mesa Mill.
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Document #558 Comment #35 Commentor: Utah Department of Environmental Quality

19D. Complication for Proposed Dry Cell Location – the currently proposed design locates the "dry" cell in an area where elevated uranium concentrations are known to exist in the shallow aquifer that exceed the State Ground Water Quality Standards (GWQS). These exceedances are found in three wells immediately adjacent to and downgradient of existing Tailings Cell 4A, and have exhibited a steadily increasing concentration trend for many years (DRC Statement of Basis, pp. 6 and 7). As a result, the exceedances are the subject of further study in an upcoming report required by the State Ground Water Quality Discharge Permit (ibid.). If these exceedances were to be determined to be the result of leakage from the IUC facility, groundwater remediation would be required in this area. That would be very difficult to do should the "dry" cell be constructed where it is proposed. Discrete groundwater monitoring of the new "dry" cell would also be complicated by the presence of such a plume. Therefore, the exact location of the "dry" cell should not be selected until completion of the referenced report, and a determination by DEQ as to the cause of the anomalous uranium concentrations.

Response:

The text in Section 3.4.5 has been modified to reflect the existing conditions identified by the commentor. The final design and location of the "dry" cell would be coordinated with IUC and the State of Utah should this alternative be selected.

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Document #558 Comment #36 Commentor: Utah Department of Environmental Quality

20. Section 2.3.1.1: EPA Ground Water Standards – Omission of State Authority for Groundwater Protection – previously we have raised the issue of State authority for water quality protection (2/3/04 DEQ comments on Preliminary DEIS, Chp. 2, Comment 40). In response to this issue DOE took the position that Residual Radioactive Material (RRM) was not defined as a "pollutant" under the Clean Water Act (3/18/04 DOE response), and therefore the State had no jurisdiction over surface water quality issues at the Moab Tailings site. Further, DOE argued that the Moab Tailings pile was not a point source discharge, and therefore did not require a permit under the EPA National Pollutant Discharge Elimination System program, of which Utah is a Primacy State. We agree with DOE's arguments about the definition of "pollutant" and a point source. However, we remind DOE that the Clean Water Act is applicable only to navigable waters of the United States. As a result, federal law has left regulation of groundwater resources to the jurisdiction of the States. Under this premise, Utah has developed it own regulations for groundwater quality protection (UAC R317-6). These rules do apply to the Moab Tailings site.

This said, we agree in concept with DOE's goal that the groundwater cleanup must be designed to protect the nearby backwater habitat. To this end, we have determined that the shallow aquifer below the Moab Tailings site is a Class IC aquifer, that must be protected as a source of water for wildlife habitat (UAC R317-6-4.4). Discussion found below elaborates our position regarding what groundwater cleanup standard is applicable to this end. DOE's cooperation with State authority in the matter will eliminate the need for escalated action.

Response:

See response to comment #24.
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Document #558 Comment #37 Commentor: Utah Department of Environmental Quality

21. Section 2.3.1.2: Contaminants of Potential Concern (p. 2−92) – we have several concerns with DOE statements in this section, as follows:

A. Contaminant K_d Assumption - we agree that ammonia-nitrogen [$NH_3(N)$] is a significant contaminant at the Moab Tailings site. However, DOE's focus on only $NH_3(N)$ in its planning of the groundwater remediation system assumes that all other contaminants of concern have the same soil-water partitioning coefficient (K_d) as $NH_3(N)$. We understand that this was done to facilitate scoping-level decisions. However, should this geochemical assumption be found in error, the cost for groundwater remediation and surface water protection could escalate greatly.

Response:

See response to comment #17.
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Document #558 Comment #38 Commentor: Utah Department of Environmental Quality

21B. DOE Errors in Surface Water Point of Compliance Concepts and Policy – several errors were made in this DOE discussion regarding State policy and requirements for surface water quality compliance, contaminant mixing zones, and determination of an appropriate groundwater cleanup criteria for ammonia-nitrogen [NH_3(N)] in the backwater habitat, as outlined below:

1) Acute Mixing Zone – the DOE is in error in its statement regarding the Utah Water Quality Regulations that "…no mixing zones are permitted for compliance with acute criteria." In contrast, the State rules depend on mixing zones to dilute or otherwise reduce point source discharges in rivers and streams (see Utah Administrative Code (UAC) R317-2-5). Beyond the acute mixing zone boundary, the acute standard must be met in the river's channel. Further, State rules also mandate that acute mixing zones must NOT (ibid.):

- Occlude or Obstruct the River Channel - instead, the width of the acute mixing zone cannot exceed 50% of the stream's width. This is done so as to allow adult fish the opportunity to swim around the acute mixing zone to avoid its toxicity (toxicity avoidance behavior).

- Have a Residency Time Greater than 15 Minutes –in other words, the acute mixing zone may not be longer than a distance equivalent to 15 minutes of in-stream travel time from the point source discharge. This length requirement is imposed in order to protect the downstream beneficial uses of the river.

Conceptually the acute mixing zone allows open channel turbulence to dilute the point source discharge to meet the acute standard. In practice, the mixing zone width and length criteria combine to control the maximum dimensions of an acute mixing zone. For a given point source discharge rate, these maximum dimensions may change with river stage. When river flow and velocity is high, the acute mixing zone may be narrow, and occupy a smaller relative cross-sectional area. Under lower flow conditions, the acute mixing zone may have a wider cross-sectional area. However, under all circumstances, the dimensions of the acute mixing zone must allow toxicity avoidance behavior of adult fish.

Response:

DOE concurs with the state's definition of acute mixing zones; therefore, the statement "…no mixing zones are permitted…" has been removed from Section 2.3.1.2. However, it must be noted that mixing zones are applicable to point source discharges of pollutants. Residual radioactive material is exempt from the definition of a pollutant under 40 CFR 122.2, and also under UAC R317-8 (1.5). This interpretation was upheld by the U.S. 9th Circuit Court of Appeals (Waste Action Project v. Dawn Mining Corporation, February 4, 1998). Therefore, mixing zones are not applicable to ground water discharges of residual radioactive material to the Colorado River. From a toxicity perspective, the USF&WS has determined that DOE's premise that 3 milligrams per liter (mg/L) ammonia in ground water would result in protective concentrations in all surface water habitat presents a reasonable approach to the problem.

Document #558 Comment #38 - response continued

However, DOE has consistently taken the position at UMTRA Title I sites, including Moab, that although exempted from the requirements of the Clean Water Act, it is committed to working with federal, state, and local regulatory agencies to protect human health and the environment. DOE has demonstrated that commitment since assuming management of the Moab site in October 2003, including implementation of interim actions to control surface water contamination and ongoing consultation with the USF&WS. In addition, DOE has identified active ground water remediation as its preferred alternative for ground water cleanup.

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Document #558 Comment #39 Commentor: Utah Department of Environmental Quality

21B (continued)

2) Applicability of Chronic Standards to Backwaters – from the above discussion it is clear that the chronic standard is applicable to the backwater habitats in question, for the following reasons:

- Lack of Point Source Discharge – discharge of contaminated groundwater to the backwater areas is not a point source discharge scenario. Therefore, the higher contaminant concentrations afforded by the acute standard, with its attendant mixing zone concept are NOT applicable to backwater habitat.

- Lack of Open Channel Turbulence – no open channel turbulence is found in backwater habitats, largely because they are open to the river's main channel only at their downstream end. Exchange of river water with the backwater habitat is only significant during rising river stage when water from the main channel enters at the downstream terminus. During this time river flow into the habitat is in a counter-current direction, and therefore little turbulence is expected. Without any open-channel turbulence no mixing zone can develop; and consequently, the acute standard is not applicable.

- Backwater Habitat: Largely Passive Flow - when backwater areas exist at the riverbank, they are fed primarily by groundwater baseflow, especially after peak runoff when river stage wanes, and when groundwater head is higher and dominates recharge to the backwater area. Because the Colorado River drainage is primarily an arid watershed, the river's flow for majority of the water year is derived principally from groundwater baseflow.

Under rising river stage conditions, the exchange of river water into the habitat is rapid and transient. However, during these short periods, some horizontal seepage may also recharge the backwater by flowing thru the barrier sandbar. This source of recharge to the backwater will be a laminar flow, and not of a turbulent nature. Because rising river stage represents so little of the water year, it appears that the passive groundwater baseflow conditions are a much greater factor in life of a backwater area and its water recharge / quality conditions.

- Lack of Opportunity for Avoidance Behavior – the life stage of the fish we are trying to protect is the larval or fry stage that cannot resist the current of the river's main channel. Because these young cannot practice toxicity avoidance behavior, the chronic standard should apply in the backwater areas.

- Long Residence Time – by definition the chronic standard is based on a minimum exposure time of 4 days (UAC R317-6-2, Table 2.14.2). The backwater areas in question form a nursery for the endangered fish, who may reside in the habitat for weeks or months. In contrast, the acute standard is designed for a 1-hour exposure (ibid.). Consequently, the chronic standard applies to the backwater areas.

Document #558 Comment #39 - continued

- Utah Narrative Standards – in addition to all these considerations, the Utah Water Quality Rules also include a Narrative Standard (UAC R317-2-7.2) for the protection of fish. Such narrative prohibits "…concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish." Certainly it is clear that to prevent mortality of the endangered fish, the chronic NH_3(N) standard is directly applicable to the backwater habitat.

Response:

See responses to comment #1, item #5; comment #2; and comment #6 regarding the applicable compliance standard.

Also, as noted in the response to comment #21, the USF&WS, a cooperating agency in the development of the EIS and the agency with jurisdiction over endangered species under the Endangered Species Act, has determined in its Biological Opinion that DOE's premise that 3 mg/L ammonia in ground water will result in protective concentrations in all surface water habitats presents a reasonable approach to the problem. The Biological Opinion is found in Appendix A3 of the EIS.

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Document #558 Comment #40 Commentor: Utah Department of Environmental Quality

21C. Incomplete DOE Evaluation: Ammonia Transfer During Groundwater to Surface Water Interactions (p. 2−92) – the DOE states it has determined that NH_3(N) contamination is reduced by a factor of 10 when the contaminated groundwater transitions from the shallow aquifer to the backwater habitat. This conclusion is based on crude and flawed DOE calculations of groundwater to surface water "dilution factors", as based on data originally collected by Fairchild, et.al. (see DOE Site Observational Work Plan (SOWP), p. 5−116 and Table 5−32). Review of these DOE calculations show several discrepancies exist that need to be resolved before any credit for a groundwater "dilution factor" can be determined, as follows (ibid., Table 5−32):

1) Lack of Evaluation: Data Time Dependence and Water Flow Field – based on the discussion above, it is clear that groundwater – surface water interactions are highly time dependent, in that discharge from the shallow aquifer to the backwater habitat, or visa versa, is highly time dynamic and significantly effected by river stage. As a result, it is necessary to understand this dynamic and establish if the river was losing or gaining water at each sampling station, before any calculation of a "dilution factor" is made. To do otherwise, could greatly over-estimate the "dilution factor" in that a low concentration observed in the pore fluids under the river channel may be the product of river water infiltration caused higher river stage, and not dilution. As a result, the data and interpretation presented in the DOE SOWP (Table 5−32) are crude and biased.

2) Need for Time Intensive Sampling – the time dependence and water flow field factors outlined above make it clear that time intensive sampling is required in order to adequately establish both the flow field and water quality conditions at each sampling site, which in turn allow accurate determination of "dilution factors". The grab samples collected by the USGS and used in Table 5−32 of the DOE SOWP were likely collected with a different purpose in mind. To establish and defend any calculation of "dilution factor", DOE needs to complete an aggressive sampling program designed specifically for this robust, time dynamic problem.

3) Missing Quality Assurance Evaluation – no evaluation was made in the DOE SOWP regarding important quality assurance issues, which is needed to verify context under which the data were collected. No information was provided on the use of any field filtering of either the river water or pore water samples collected. Nor was any description provided on where in the water column the surface water samples were taken (water surface, mid-column, base of channel, etc), or how (e.g., discrete grab samples, composite samples, etc.). No information was provided about where any of these samples lie with respect to its position within the groundwater contaminant plume. Without such information it is difficult to put the data in context and interpret what it means. All this needs to be done before calculation of any "dilution factor".

4) Lack of Statistical Power in DOE Calculations: Problem of Standard Deviation – if one ignores the above factors of time dependence, water flow directions, and quality assurance concerns, and simply calculates the standard deviation of the data presented in Table 5−32 of the DOE SOWP, it is easy to see that there is little statistical power in the DOE presentation. We have repeated DOE's calculations and agree that the mean "dilution factor" is 73.65, based on the 55 values they provided in the table. However, we have found that the standard deviation of this same data is almost 3-times greater, 195.91. This extreme variability indicates that the data

Document #558 Comment #40 - continued

are not normally distributed, and are likely unrelated to one another. This finding casts further doubt on DOE's conclusions regarding a "dilution factor" for the site. Further evaluation, sampling, and analysis is necessary in order for DOE to arrive at a defensible ammonia "dilution factor" for the backwater habitat in question.

5) Need Apply Chronic Standard to Groundwater – as a result of all these considerations, it is clear that DOE needs to collect additional data. Until DOE is able to provide a scientifically defensible evaluation of this contaminant transfer phenomenon between the local groundwater and the backwater habitat, the chronic ammonia standard, 0.6 mg/l, must be applied as a compliance strategy to the local groundwater.

From the above discussion it is clear why the acute NH_3(N) standard has no application to the backwater habitat in question. It is also clear that only the chronic NH_3(N) standard, 0.6 mg/l, is applicable to this critical habitat. Lacking the requisite studies to adequately determine the geochemical behavior of NH_3(N) during its transfer from the contaminated groundwater to the backwater areas, DOE must take the conservative posture and apply the chronic standard as an interim groundwater cleanup criteria. To do neither the required studies, or apply the chronic standard as a cleanup goal will result in a takings of endangered fish, and is not protective of the environment upon which they depend.

Response:

A more recent calculation set completed after preparation of the SOWP and the draft EIS supports the position that a 10-fold dilution factor does apply in most instances where the ground water plume is discharging to the backwater areas adjacent to the site. In background locations where elevated ammonia from the Paradox Formation discharges to the surface water, the 10-fold dilution factor may not apply. This more recent calculation set (DOE 2005a) also provides a more detailed evaluation of the transfer mechanism between ground water and backwater areas and supports DOE's position in the EIS that the 3-mg/L ammonia target goal in ground water would be protective because it would result in protective concentrations in all surface water habitats.

Specific DOE sampling and quality assurance/quality control (QA/QC) procedures are listed in Section 4.3.1 (Water Sampling Procedures) of the SOWP (DOE 2003a). All sampling and analysis was conducted in accordance with the Sampling and Analysis Plan for the UMTRA Ground Water Project as described in the SOWP. An independent data validation assessment was conducted on 100 percent of all the analytical results for all the quarterly samples. Each validation data report is listed in Table 4–21 in the SOWP and is available for review on DOE's web site. Information regarding filtering methods, duplicate samples, sample depth, location map, etc., is provided in the validation data reports and in the analytical summaries in the SOWP (Volume II, Appendix C).

Document #558 Comment #40 - response continued

The commentor confirms DOE's calculation and appears to agree that the mean "dilution factor" is 73.65, based on the 55 values provided in Table 4−21. It appears that the commentor is concerned that the standard deviation of this same data is almost 3 times greater, 195.91, and that this variability indicates that the data are not normally distributed. DOE agrees that the distribution may be log-normal. The relatively high mean and standard deviation is the result of numerous dilution factors listed in Table 4−21 that are greater than 100 and range as high as 1,366, indicating significant dilution. Use of a 10-fold dilution factor that is less than the mean is conservative. In addition, several values listed in Table 4−21 are zero, indicating that a dilution factor could not be calculated because the surface water concentration was below detection limit. For these cases, even if no dilution were occurring, since the actual surface concentration was below detection limit, no exceedances in the standard would result. The data set was reevaluated using only non-zero values in the analysis and eliminating locations where the surface water concentrations were below the lower end of the chronic AWQC (0.2 mg/L ammonia, total as N). The arithmetic and geometric means of the revised data set are 91.17 and 14.34, respectively, both of which are greater than the 10-fold dilution factor. DOE believes that a 10-fold dilution factor is realistic for use in establishing target goals for ground water remediation. However, DOE also acknowledges that simple dilution is not the only factor that influences surface water concentrations adjacent to the site.

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Document #558 Comment #41 Commentor: Utah Department of Environmental Quality

22. Section 2.3.2: Proposed Ground Water Action (p. 2−98) – statements made by DOE that the duration required for active groundwater remediation is similar regardless of the selection of an on or off-site disposal option is an artifact of the artificial groundwater cleanup standard selected for ammonia-nitrogen, 3.0 mg/l. As already mentioned above, if the chronic standard, 0.6 mg/l ammonia-nitrogen, were selected, the duration would increase to 200 years or more (see DOE DEIS, Fig. 2−43).

Response:

See response to comment #2 regarding the duration of the alternatives.

See responses to comment #1, item #5; comment #2; and comment #6 regarding the applicable compliance standard.

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Document #558 Comment #42 Commentor: Utah Department of Environmental Quality

23. Section 2.3.2.1: Groundwater Remediation Options (p. 2−101) – in the discussion regarding deep well injection disposal in the Paradox Formation of contaminated wastewater generated by groundwater remediation, the DOE may want to consider the higher chance of success for such disposal in the deeper Mississippian-age Leadville Dolomite Formation, which is known regionally as oil-producing horizon.

Response:

Section 2.3.2.1 has been revised to reflect that in addition to the Paradox Formation, the deeper Leadville Formation may also be a target zone for disposal of contaminated ground water.
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Document #558 Comment #43 Commentor: Utah Department of Environmental Quality

24. Section 2.3.2.4: Active Remediation Operations (pp. 2−106 and 107) – DOE has grossly underestimated the time and costs required for active groundwater remediation for the on-site option, based on the following two findings:

A. DOE Cleanup Time Predictions are Artificial - the DOE statement that active groundwater remediation would only be needed for 75−80 years is an artificial construct built on the assumption that a groundwater cleanup goal of 3.0 mg/l (surface water acute ammonia-nitrogen standard) is appropriate for the Moab site. For reasons discussed above, this goal is not protective of the endangered fish in the backwater habitat areas. When the chronic ammonia-nitrogen standard, 0.6 mg/l, is used for this purpose, a striking difference arises in the comparative time required and related costs for on and off-site remediation of the tailings pile. Under this conditions, the time required for active groundwater remediation increases from 80 to 200 years (see DOE DEIS Fig. 2−43). This 120 year increase in the time the groundwater remediation system needs to be operated, equates to an incremental increase in total project cost of about $108,000,000 (see discussion above).

Response:

See responses to comment #1, item #5; comment #2; and comment #6 regarding the applicable compliance standard and ground water remediation time and cost.
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Document #558 Comment #44 Commentor: Utah Department of Environmental Quality

24B. DOE Contaminant Transport Model is Not Representative – Omission of Long-term Effects of Ammonia Salt Layer and Source Term Spike Concentration (Fig. 2−43) – the DOE statement that groundwater cleanup can be achieved in 75−80 years fails to include the effects of the ammonia salt layer in the tailings on the DOE contaminant transport model. Review of the DOE SOWP (pp. 6−11 and 12, and 7−23) show that DOE's contaminant transport model assumed a constant tailings pore fluid ammonia concentration source term (1,100 mg/l). However, by DOE's own estimates, this ammonia salt layer near the top of the tailings pile will solubilize and be transferred to the water table by infiltration seepage thru the on-site cover system. In turn, this seepage will then cause a 16-fold increase in the ammonia contamination applied at the water table (dissolved ammonia-nitrogen = 18,000 mg/l). Using DOE's estimates, this spike-like increase in ammonia would begin to arrive at the water table about 1,094 years after cover construction (SOWP, pp. 6−11 and 12 and Fig. 6−3). This means that the existing DOE ammonia break-thru curves (DEIS Fig. 2−43), are not fully representative, in that they are limited to the first 200 years of system performance, and that the asymptotic relationship shown for the on-site option will not hold true after year 1,094. At that point in time, the ammonia source term concentration applied to the water table will increase, and a subsequent spike increase in the predicted groundwater and backwater habitat concentrations will follow. DOE has estimated that the duration of this spike in ammonia concentration would be about 440 years (DEIS, p. 4−7 and SOWP, p. 6−11). Consequently, DOE's predictions that only 75−80 years of active groundwater remediation are required, ignore this delayed spike or pulse in the ammonia source term, and are therefore suspect. This also means that DOE has failed to fully evaluate the ammonia hazard to groundwater and the backwater areas for the entire life cycle or duration of the hazard, as instructed by the NAS (see discussion above). However, the long-term effects of this ammonia salt layer inside the tailings pile become mute, if the tailings are relocated.

Response:

See response to comment #1, item #3, regarding the ammonia salt layer.
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Document #558 Comment #45 Commentor: Utah Department of Environmental Quality

25. Section 2.3.3: Uncertainties - Sensitivity and Omission of Key Transport Parameters and Need for Conservative Approach (pp. 2−108 and 109) – we have several concerns with the DOE statements made regarding uncertainty. We agree with the DOE statement that the outcome of contaminant transport modeling is commonly sensitive to the input values used. This is common knowledge by many who conduct contaminant transport modeling. Some of these sensitive parameters include: soil/water partitioning (K_d) coefficients, contaminant source term, contaminant half-life, aquifer dispersion coefficients, etc. This is the underlying reason why DEQ is concerned about DOE's use of a surface water standard for the backwater habitat as a groundwater compliance and cleanup criteria for the project.

Unfortunately, DOE has simply assumed a 10-fold dilution will happen during transfer of the ammonia contamination from groundwater to surface water. This assumption is based on a crude evaluation of limited water quality data collected by others researchers who had another mission in mind. DOE's evaluation of this data is significantly flawed, and hence DOE's calculated "dilution factor" carries little weight or efficacy for the project. For additional details see DEQ discussion above. Despite these shortcomings, DOE has plowed ahead and made certain assumptions about its ability to control the contamination and protect backwater water quality habitat. At the nexus of this hubris is the risk that more than 120 extra years of active groundwater remediation could be required to cleanup this site, and the risk that the total project cost could be greater by at least $108,000,000. A matter with this weighty of a price tag deserves the expenditure of some resources to examine and resolve it.

This problem and the need for additional geochemical studies to examine these critical contaminant transport modeling assumptions were brought to DOE's attention during a July 9, 2003 conference call with DEQ staff, DOE, its contractors, and the U.S. Fish and Wildlife Service. At that time, DOE said it did not have time to fully explore and resolve this issue. Certainly the cost to resolve this issue will not decrease in the future. If DOE is unwilling or unable to study and resolve these concerns, it must then take a conservative posture and apply the same chronic ammonia-nitrogen surface water standard, 0.6 mg/l, as a groundwater cleanup criteria. To do otherwise is to take a huge gamble with a large amount of public money ($108,000,000).

Response:

See responses to comment #1, item #5; comment #2; and comment #6 regarding the applicable compliance standard.

Uncertainties regarding the ground water flow and transport model are addressed in Table 2−33 of the EIS, item #2.
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Document #558 Comment #46 Commentor: Utah Department of Environmental Quality

26A. Surface Water (p. 2−140) – we take exception to the statement in this table that the on-site disposal option would result in only 80 years of active groundwater remediation. Based on the discussion above, 200 years or more may be required. It is important to consider the related price tag for this 120 or more years of extra groundwater cleanup, which equates to more than $108,000,000.

Response:

See responses to comment #1, item #5; comment #2; and comment #6 regarding the applicable compliance standard and ground water remediation time and cost.
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Document #558 Comment #47 Commentor: Utah Department of Environmental Quality

26B. Floodplains and Wetlands (p. 2−141) – no mention is made here about the adverse impact to the floodplain should river migration undercut the tailings pile and distribute contamination downstream. Based on the discussion above, this risk needs to be accounted for and the consequences discussed in this table.

Response:

See response to comment #1, item #1, regarding river migration.

The potential consequences of a disposal cell failure accident are included in Table 2−32 of the EIS. The risks from disposal cell failure from natural phenomena are more fully addressed in Section 4.1.17 of the EIS, which includes impacts to downstream users and adjacent terrestrial and aquatic environments.

Prediction of sediment behavior in the event of pile failure is difficult and would depend on numerous factors. Based on the proposed armament of the pile and the buried riprap wall (Sections 2.1.3.1 and 2.1.4) designed to intercept river migration, it is highly unlikely that a catastrophic failure of an on-site disposal cell would occur. However, to aid in decision-making, DOE has assumed failure and assessed the possible impacts in Section 4.1.17. In addition, DOE has expanded this section to include a summary of the river mixing calculations that estimated downstream contamination. It is possible that effects could be more severe than those described in the EIS. In the unlikely event of a cell failure, some impacts would be long-term, except for ammonia, which is known to degrade and volatilize in the environment. The EIS specifically states that "…impacts from uranium in the sediments may be longer term because it complexes with sediments where it is likely to be more persistent" (Section 4.1.17). DOE agrees that sediments would continue to be redeposited over both the short and long term. This further supports the position in the EIS of more significant short-term impacts, because continued dilution and dispersion would reduce concentrated areas. Some long-term impacts would continue; however, the uncertainties associated with attempting to quantify them are extremely high.
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Document #558 Comment #48 Commentor: Utah Department of Environmental Quality

26C. Accident Conditions, Disposal Cell Failure – Omission of River Migration Issue (p. 2−163) – DOE has flagrantly omitted any mention of adverse impacts to downstream users should the river migrate and undercut the tailings pile at some time in the future. Such destabilization would distribute contaminated tailings along beaches and sandbars across long stretches of the Colorado River. This contamination would have a significant impact to the local tourist economy. Costs to the public to cleanup such a spill would be extremely high and the task very difficult given the lack of access, the remote locations, and logistics of river travel thru the canyonlands.

Response:

See responses to comments #1 and #47. The on-site disposal section of Table 2−23 (Accident Conditions / Disposal Cell Failure) referred to by the commentor states:

“Some human health risk under the residential scenario” and “Negative impacts to aquatic receptors from uranium and ammonia concentrations in Colorado River”. This is to be compared with the corresponding summary for the off-site disposal alternatives, which states in part “Possibility of a failure occurring and having adverse consequences is much lower than at the Moab site.”

Table 2−32 does not attempt to capture every element of the impact analyses provided in Chapter 4.0, but is an attempt to present a summary for comparison purposes. The EIS acknowledges the remote possibility of a cell failure but does not attempt to quantify the cost of remediating such an unlikely event.
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Document #558 Comment #49 Commentor: Utah Department of Environmental Quality

27. Section 2.6.3: Consequences of Uncertainty – Omission of Sensitive River Migration Issue (p. 2−165) – we take strong exception to the statement that groundwater modeling is the only aspect of uncertainty that has the potential to significantly effect the reclamation decision. As discussed above, DOE has acted in a biased and prejudicial manner in its downplay of the river migration issue for this site. Recent USGS hydrologic modeling has clearly demonstrated that this stretch of the Colorado River has the potential to undercut and de-stabilize the tailings pile under 100-year flood flow conditions. Even greater erosion potential is evident under higher flow conditions, and/or in combination with any river channel scour that may develop near the West Portal. Further, nearby river terrace gravel deposits found also provide sound geologic evidence of the river's erosive power in the past. Clearly the National Academy of Science identified this issue as critical to the project reclamation decision. To leave the pile in place and then have the river undercut and destabilize it during a future flood event would have dramatic negative impacts to tourism and recreational uses of the river between Moab and Lake Powell. Contamination left on beaches and sandbars along this stretch or the river would be extremely difficult and costly to cleanup. These impacts must be discussed in this section regarding the consequences of uncertainty. The costs that would follow such a failure also need to be clearly spelled out for all to see.

Response:

See responsse to comment #1, item #1, and to comments #47 and #48.

Based on further consideration of the range of uncertainties, the newly added Section 2.6.4 (Responsible Opposing Views), and the analyses in the EIS, DOE no longer considers the uncertainties regarding ground water modeling as the only discriminator for decision-making and has deleted this text in Section 2.6.3 and in the Summary. DOE acknowledges the possibility of river migration and has proposed appropriate mitigation measures (riprap barrier wall and riprap side slope armoring) specifically in response to the possibility of river migration and flooding.
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Document #558 Comment #50 Commentor: Utah Department of Environmental Quality

28. Table 2−33: Consequences of Uncertainty (pp. 2−166 thru 175) – this table is a recapitulation of the same discussion in Table S−1 of the DEIS Summary. Therefore all the State comments above for Table S−1 apply to this section also (see discussion beginning on page 2, above).

Response:

All changes in Table 2−33 are reflected in Table S−1 and, as appropriate, elsewhere in the text of the EIS.
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Document #558 Comment #51 Commentor: Utah Department of Environmental Quality

29. Section 2.7.1: Areas of Controversy – FWS Position (p. 2−165) – we take strong exception with the implication that the US Fish and Wildlife Service (FWS) agrees with DOE on the application of target goals for groundwater cleanup. As stated previously, DEQ discussions have found that both DEQ and FWS agree that the chronic ammonia-nitrogen standard must be met in the backwater habitat in order to protect endangered fish. However, the DOE statement that "The USF&WS agrees with DOE that the target goals that DOE has selected would be protective of aquatic species in the Colorado River" is misleading. What was not said, is that this FWS agreement is conditioned upon unsubstantiated DOE affirmations that the proposed groundwater cleanup goal (acute 3.0 mg/l ammonia-nitrogen standard) will allow water quality conditions in the backwater habitat to meet the 0.6 mg/l chronic ammonia nitrogen standard (personal communication, Henry Maddux, FWS – Salt Lake City).

To date, DOE has not completed any technical studies to confirm if its claim can actually be met. Further, DOE's assumptions on the groundwater to surface water dilution factor are weak and without merit, as discussed above. In addition, DEQ has little confidence in DOE's contaminant transport predictions, in that it failed to incorporate the effects of the secondary ammonia pulse that would result long-term from leaching of the ammonia salt layer found in the upper portion of the tailings pile.

Further, it is important to note that the FWS will stipulate conditions in the upcoming Biologic Opinion to require DOE to positively demonstrate that the groundwater remediation system will allow water quality conditions in the backwater area to meet the 0.6 mg/l chronic ammonia-nitrogen standard (personal communication, Henry Maddux, USFWS, SLC).

Until this demonstration is made, it is uncertain if DOE can successfully meet the required water quality conditions and prevent takings of endangered fish with the on-site stabilization option. Should DOE be unable to successfully complete this demonstration, it is possible that the time required for groundwater remediation will increase by more than 120 years (from 80 to 200 years total). This would result in an increase in the total on-site remediation cost of at least $108,000,000. Such a large amount of public resources deserves additional evaluation to determine if the proper geochemical conditions exist to support DOE's groundwater dilution assumptions. Lacking such an evaluation, the DOE should conservatively assume at least a 200 year timeframe for active groundwater remediation under the on-site option, and include these related costs in the total project cost.

Should DOE be unsuccessful in making this demonstration, a dramatic difference will exist between the on and off-site remediation options in that the on-site option would take 200 years instead of 80 to cleanup the groundwater. This would result in an increased cost to the total on-site remediation project of $108,000,000, which is about 65% of the total cost for this option. Under these circumstances there would be a significant difference in the costs for the on-site versus off-site solutions (contrary to DOE's statements). This information must be provided to the policymakers.

Response

See response to comment #21.
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Document #558 Comment #52 Commentor: Utah Department of Environmental Quality

30. Section 2.7.1: Areas of Controversy – Comparability of Groundwater Remediation Costs (p. 2−176) – the DOE statement that "Groundwater remediation would occur under any of the action alternatives" must be clarified. As discussed above, leaving the pile in place will perpetuate the contaminant source term, and likely require 200 years or more of active groundwater remediation in order to meet the 0.6 mg/l chronic ammonia-nitrogen standard. For this reason, there is a dramatic difference in groundwater remediation costs for the on-site versus the off-site options.

Response:

See responses to comment #1, item #5; comment #2; and comment #6.
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Document #558 Comment #53 Commentor: Utah Department of Environmental Quality

31A. On-Site Implications for River Migration – recent USGS river water velocity and shear force modeling has demonstrated that the river has the potential to move particle sizes in the range of medium sized (1.45−2.91 inch) gravels under the 100-year flow condition, see Attachment 1, below (Kenney, Fig. 47). Larger particle sizes can be moved under higher flow rates (ibid, Figs 48 and 49), or if scouring of the river bed occurs at the West Portal (ibid., Figs. 50, 51, or 52, etc). Clearly if the river channel can transport material this size it can easily erode silts and fine sands found on the riverbank and under the tailings pile. Consequently, if the on-site option is selected, the right riverbank will need to be armored to protect the tailings pile from erosion.

We also strongly disagree with DOE that river migration will be a slow process that can be managed from year to year. On the contrary river avulsion can be rapid and catastrophic, especially under flood conditions found in the arid southwestern United States. This was recently reaffirmed in Utah when the Santa Clara river jumped its banks and destroyed more than 25 homes in a matter of hours.

As a result, the riprap protection required to protect the tailings pile will need to be extensive and run for 1,000's of feet along the mill site and adjacent to the tailings pile (ibid., Fig. 47). This material will need to be significantly larger in diameter than what the river can transport, and of high quality to resist these erosional forces. The costs associated with this construction need to be added to the on-site option in Table 2−35.

Response:

See response to comment 1, item #1, regarding river migration.
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Document #558 Comment #54 Commentor: Utah Department of Environmental Quality

31B. On-Site Implications for Chronic Ammonia-Nitrogen Standard for Groundwater Cleanup - the statement that the on-site option will require only 80 years of active groundwater remediation is an artificial construct based on an substantiated DOE assumptions regarding the applicable groundwater cleanup standard and “dilution” factors. As discussed above, this figure could be greatly larger should the 0.6 mg/l chronic ammonia-nitrogen standard be applied to the groundwater cleanup. Further, DOE’s groundwater to surface water “dilution” factor is suspect. As a result, more than $108,000,000 is riding on these DOE assumptions. Should DOE be wrong on either of these, more than 200 years of active groundwater would be required, which would result in an increased project cost of at least $108,000,000 (120 extra years @ $900,000/year). Certainly this problem deserves additional study and evaluation. However, if DOE is unable to complete this pre-requisite work, the conservative assumption should be made and the on-site stabilization option increased to reflect this additional cost. Please modify Table 2−35 to reflect at least a $108,000,000 increase in the on-site stabilization cost.

Response:

See responses to comment #1, item #5; comment #2; and comment #6 regarding the applicable compliance standard and cost.
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Document #558 Comment #55 Commentor: Utah Department of Environmental Quality

32. Section 2.7.3.1: On-Site Versus Off-Site Disposal Alternative Comparison (p. 2−179) – the percentages listed need to be revised. The cost figures in Table 2−35 need to be adjusted to reflect at least 120 more years of additional active groundwater remediation that will be needed for the on-site stabilization option, as a result of the chronic ammonia-nitrogen (0.6 mg/l) standard for groundwater cleanup and the failure to evaluate the secondary ammonia pulse. At a minimum, the total project costs should be changed as shown in the table below. With these new figures, the Klondike Flat option is only 14% more than the on-site stabilization alternative, while the Crescent Junction is only 15% more.

Given the risk of river migration that the on-site option poses, the related design engineering/construction costs to control the river, and the long term maintenance costs that might be involved, this 14% differential is an inexpensive insurance policy.

	Stabilize in Place	Klondike Flats			Crescent Junction			White Mesa	
		Truck	Rail	Pipeline	Truck	Rail	Pipeline	Truck	Rail
Previous DOE Grand Total (Table 2-35)	$248.8 M	$407.2 M	$468.7 M	$472.1 M	$410.8 M	$472.3 M	$479.0 M	$497.1 M	$542.7 M
120 years of Extra Groundwater Remediation	$108 M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Extra Riprap Protection	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
New Grand Total	$356.8 M	$407.2 M	$468.7 M	$472.1 M	$410.8 M	$472.3 M	$479.0 M	$497.1 M	$542.7 M
Ratio of Offsite to Onsite Costs	1.00	1.14	1.31	1.32	1.15	1.32	1.34	1.39	1.52

None of these figures include the 440 years of active groundwater remediation that will be needed at year 1,110 to control the secondary ammonia pulse from leaching of the ammonia salt layer found in the upper reaches of the pile. If we use the $900,000/year cost estimate for this active groundwater remediation, the cost for future control of this ammonia salt layer alone would represent more than $395 Million. Under these circumstances, the Klondike option would be even less costly than the on-site alternative.

Response:

See responses to comment #1, item #5; comment #2; and comment #6, regarding the applicable compliance standards and cost. See comment #1, item #3, regarding the possible secondary ammonia pulse.

The cost estimates in the EIS reflect DOE's assumptions. DOE acknowledges that treating ground water to meet the chronic standard that the UDEQ supports and treating ground water for hundreds of years due to the salt layer would increase the cost estimates in the EIS under the on-site disposal alternative.

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Document #558 Comment #56 Commentor: Utah Department of Environmental Quality

33. Section 3.1.1.1: Moab Site Stratigraphy – Need to Define Age of Quaternary Deposits (p. 3.6) – previously we suggested that DOE needs to determine the age of nearby Quaternary deposits in order to establish if the river has a potential to migrate and undercut the pile (2/3/04 DEQ Comments on Preliminary DEIS, Chp. 3, Comment 1). DOE responded that the 11/03 DOE River Migration Report adequately addressed this concern. We disagree. Recent USGS modeling has established that the Colorado River can easily transport medium sized (1.45−2.91 inch) gravel materials under 100-year flood conditions (see Attachment 1 below, Fig. 47). Even larger particle sized can be transported by the river under higher flow rates and/or if the river scours its channel near the West Portal (ibid., Figs. 48−49 and 50, 53, and 56, respectively). Certainly the fine silts and sands found on the riverbank and under the tailings pile are much more prone to erosion. As a result, the need for this age dating is more important than before, should DOE select the on-site stabilization option.

Response:

See response to comment #1, item #1, regarding river migration.
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Document #558 Comment #57 Commentor: Utah Department of Environmental Quality

34. Section 3.1.1.4: Geologic Hazards – Omission of River Migration – no mention is made in this section regarding horizontal river migration, channel avulsion, or possible undercutting of the tailings pile by the river. Clearly, the river has significant potential to migrate horizontally and undercut the pile, as demonstrated by recent USGS river velocity and shear force modeling where it was demonstrated that a 100-year flood event could easily move medium diameter (1.45−2.91 inch) gravel in the river's channel (see Kenney, Fig. 47 in Attachment 1, below). Certainly the finer grained silts and sands in the riverbank near the tailings pile would be even more prone to erosion under these conditions. Furthermore, higher river flow rates in a 500-year or larger flood, could move even larger particle sizes (ibid., Figs. 48 and 49). The same is true if the river scours its channel near the West Portal (ibid., Figs 50, 53, and 56). Recent experience with 100+ year floods on the Santa Clara River system have shown that horizontal migration of the river's channel can be swift and dramatic. DOE must thoroughly evaluate this geologic hazard in this section.

Response:

See response to comment #1, item #1, regarding river migration.
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Document #558 Comment #58 Commentor: Utah Department of Environmental Quality

35. Section 3.1.3.1: Millsite Contamination (p.3−9) – in addition to the focus on Radium-226 concentrations, DOE should also evaluate the mill site soils to determine the concentrations of other key contaminants. This evaluation should be done in order to ensure that all mill site soil contaminants are properly controlled and do not form source terms for future leaching and groundwater contamination. Emphasis needs to be put on heavy metals, ammonia-nitrogen, and other non-radiologic contaminants.

Response:

Radium-226 concentrations in soils would be remediated to the cleanup standards in accordance with 40 CFR 192. Cleanup standards for nonradiological contaminants are not provided for in the UMTRCA regulations. However, DOE considers radium an indirect indicator for the nonradiological contaminants. Therefore, cleaning up the radiological contaminants would also clean up the nonradiological contaminants by association. DOE has successfully applied this principle at other Title I sites.
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Document #558 Comment #59 Commentor: Utah Department of Environmental Quality

36. Section 3.1.6.2: Moab Site Groundwater Occurrence (pp. 3−19 and 20, Fig. 3−8) – the description of the conceptual groundwater model on page 3−19 should include 2 important concepts, as follows:

A. Vertical Extent of Legacy Groundwater Contamination – groundwater contamination from historic site operations have caused tailings related contaminants to be found below the freshwater-saltwater boundary (~35,000 mg/l TDS). We agree with your discussion on page 3−26 of how site operations generated a dense wastewater (TDS of 50,000 – 150,000 mg/l) that penetrated the 35,000 mg/l saltwater boundary, thereby contaminating the deep brine layer.

B. Ongoing Contamination Effects of Diffusion from Contaminated Saltwater Layer – contaminants are transferred from the deep saltwater layer to the freshwater layer thru diffusion. As a result, historic groundwater contamination found below the freshwater-saltwater interface will continue to contribute contaminants to the freshwater system and backwater areas for an extensive period of time. This diffusion will prolong the time it takes for the legacy plume to be eliminated from the freshwater system under both passive flow conditions or active groundwater remediation.

Response:

See response to comment #25.
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Document #558 Comment #60 Commentor: Utah Department of Environmental Quality

37. Section 3.1.6.3: Moab Site Groundwater Quality – we have several concerns with DOE statements made in this section, as follows:

A. Need to Better Define Groundwater – Surface Water Interactions (Fig. 3−9) – Figure 3−9 of the DEIS shows the freshwater - saltwater interface (35,000 mg/l TDS contact) as converging on the Colorado River. However, no nested piezometer data is available to confirm this relationship at the river's edge. Consequently, it is possible that this basal boundary to the freshwater system does not intercept the river at this location, but at some other location. To define this relationship, DOE should install nested piezometers at the river's edge and carefully monitor river stage and groundwater head in a very time dynamic way. Until this relationship is well defined, we won't know for certain how many receptors may be exposed to tailings contamination.

The lack of shallow groundwater convergence on the river is also evident in groundwater data collected by the University of Utah, where oxygen-18 to oxygen-16 ratios ($\delta^{18}O$) indicate that groundwater in the freshwater system on the DOE side of the river has traveled under the river and is found in certain areas of the water table under Matheson Preserve. This groundwater underflow beneath the river is evident where groundwater under the Matheson Preserve has a similar $\delta^{18}O$ signature as groundwater found near the tailings pile, i.e., with $\delta^{18}O$ values between –13 and –12, which is indicative of Glen Canyon Group recharge from a lower elevation [see Gardner and Solomon, pp. 18−20, Figs. 15 and 16, and Table 5, wells BL-1 (D), BL-2 (S, M, and D) N8 (10 and 14m) N11 (4 and 7m) , M11 (12 and 14m), BL-3 (S, M, and D)]. In contrast, other wells on the Matheson Preserve side of the river exhibited even smaller $\delta^{18}O$ values, in the range of –15 to –14, which is indicative of a higher elevation precipitation and groundwater recharge on the nearby La Sal mountains [ibid., Fig. 2, Table 5, and wells N3 (4 and 8m), N4 (6 and 12m), N5 (7, 10, and 14m), N6 (6 and 9m), N7 (7 and 10m), and W1 (4 and 7m)]. For comparison, a river water sample collected by the University in April, 2003 during spring runoff at site CR1 showed a $\delta^{18}O$ value of –15.4, which is also indicative of high elevation precipitation (ibid., Table 5). If the Colorado River was a hydraulic barrier, as claimed by DOE, then all the wells on the Matheson Preserve side should show small $\delta^{18}O$ values, on the order of –15 to –14.

Since this is not the case, the University of Utah geochemical evidence indicates the groundwater / surface water relationship is complex near the Moab Tailings site. This relationship needs to be well understood so as to define the fate of the groundwater contamination and adequately design a remediation system to control it. This information was brought to DOE's attention previously during comments on the Preliminary DEIS (2/3/04 DEQ Comments, Chp. 3, Comment 8). However, DOE chose to ignore it.

B. Need to Explain and Justify Background Groundwater Concentrations (pp. 3−21 thru 24 and Table3−7) – review of Table 3−7 has found that the "background" concentrations were derived from the DOE SOWP, Table 5−11. In turn, these data were based on 2 groups of monitoring well data that need revision, as follows:

1) Fresh Qal Facies – as based on wells RW-01, AMM-1 and MOA-456 (DOE SOWP, p. 5−51). However, no explanation is provided in the DOE SOWP on why these 3 wells represent background groundwater conditions. Further, well AMM-1 appears to be located downgradient

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of the former Atlas ore-storage area (compare SOWP, Fig 5−19 with DEIS, Fig. 3−7). Consequently, groundwater at this location may have been affected by historic site operations, and this well should be omitted from consideration in determining background ground water quality.

In addition, the average TDS in each of these wells varies by more than 10-times, e.g., 708 mg/l in well RW-01, 5,530 mg/l in well MOA-456, and 7,113 mg/ in well AMM-1 (DOE SOWP, Table 5−8). Such high variability in groundwater quality could be a product of natural conditions. However, given the long history of this site and the possibility that well AMM-1 could be located downgradient of the former ore storage area, this well should be eliminated from any determination of background groundwater quality.

Previously, DEQ recommended that DOE consider use of groundwater quality data from the nearby water supply well at the Arches National Park Headquarters, to represent background groundwater quality for this facies (2/3/04 DEQ Preliminary DEIS Comments, Chp. 3, Comment 11). Clearly, this geologic formation recharges the shallow alluvium found near the site, and this well is located at a sufficient distance from the tailings site, that it is unlikely to have been influenced by past tailings disposal activities. Unfortunately, DOE ignored this suggestion, and instead included the tainted well AMM-1 in its background determination.

2) Brine Qal Facies – was based on several wells apparently located in the Matheson Preserve, including: M11-14, N7-10, N7-11, W1-4.3, W1-7, and W1-10 (DOE SOWP, p. 5−54 and Table 5−9). The DOE SOWP also mentions that two other wells were used in this analysis, M9 and M10, from a 1994 Cooper and Severn Study. However, no information is provided in the SOWP to locate these last two wells (SOWP, Fig. 5−23) or to provide any groundwater quality data from them (SOWP, Table 5−9). Furthermore, no explanation is provided in the SOWP on why any of these wells represent background groundwater conditions in the Brine Qal facies.

As discussed above, well M11-14 should not be considered used in this background evaluation, in that it has a $\delta^{18}O$ signature that does not reflect the high elevation recharge of other wells in the Matheson Preserve, but instead has a signature similar to that seen on the opposite side of the river near the Moab Tailings (Gardner and Solomon, Table 5). This $\delta^{18}O$ signature indicates that groundwater found in well M11-14 may originated from Glen Canyon Group recharge from the DOE side of the river, and therefore may have been influenced by historic site operations and tailings seepage. This possibility needs to be thoroughly examined and eliminated before inclusion of this data into the background groundwater quality data set.

In summary, any determination of background groundwater quality for either of these facies must include a careful and detailed examination and justification of hydrogeologic and geochemical considerations, to ensure that the data so used represents natural groundwater quality conditions that have not been influenced or altered by man’s activities.

C. Missing State Groundwater Quality Standards (Table 3−7) – no consultation was made with DEQ to determine State Ground Water Quality Standards that may be applicable to the site cleanup. These parameters and corresponding concentrations need to be added to Table 3−7 of the DEIS.

Document #558 Comment #60 - continued

D. Unsubstantiated Ammonia Dilution Factor (p. 3−26) – we disagree that sufficient data is available to justify a 10-fold dilution factor for the ammonia-nitrogen transfer from shallow contaminated groundwater to the backwater habitat. Details comments regarding the problems with DOE's assumptions are discussed above.

E. Need to Resolve Fate of Tailings Contamination in Deep Saline System (p. 3−26) – we agree that:

1) There is a shallow freshwater system of groundwater that overlies or floats on a heavier saline groundwater system at the site,

2) That historic tailings pile seepage has traveled downward to a depth greater than the saltwater interface (35,000 mg/l TDS) which forms the base of the freshwater system shown on Figures 3−8 and 9, and

3) That this historic pollution has created a deep "reservoir" of ammonia contamination that will continue to contaminate the shallow freshwater system thru diffusive processes.

However, no mention is made in the DEIS about advective transport of this deep contamination, or its fate in the environment. Instead the DOE DEIS focuses only on the shallow freshwater system at the site.

Previous work by the University of Utah has shown that the deep saline groundwater below the 35,000 mg/l TDS interface travels horizontally beneath the Colorado River and under the Matheson Wetlands (Gardner and Solomon, p. 15 and Figure 7). Other lines of geochemical evidence, such as groundwater $\delta^{18}O$ values, also support this conclusion (ibid., pp. 18−20 and Figures 15 and 16). This information conflicts with that shown on DOE DEIS Figure 3−9, which suggests the deep saline system discharges directly to the river. DOE needs to define local groundwater – surface water interaction, including the interaction of the river with the deep saline system, so as to determine the fate of this deep seated pollution and its possible future effects on the environment. This issue was brought to DOE attention previously in DEQ comments on the Preliminary DEIS (2/3/04 DEQ Comments, Chp. 3, Comment 8). To date, DOE has failed to resolve this issue in its groundwater cleanup efforts.

Response:

A more recent calculation set (DOE 2005a) completed after preparation of the SOWP and draft EIS provides a more detailed evaluation of the transfer mechanism between ground water and backwater areas and supports the conceptual model presented in the EIS regarding ground water convergence on the river. This calculation set also presents results from nested piezometers.

Section 5.3 of the SOWP provides an extensive evaluation on background water quality at the site (see pages 5−36 through 5−54). AMM-1 is located upgradient of the former ore storage area near US-191. The ore storage areas are shown in Figures 3−2 through 3−5 in the SOWP and are located near the former mill, not near the northeast corner of the property by US-191. In addition, analytical results for water samples collected at this well do not indicate site-related contamination, but rather are consistent with background water quality for other upgradient

Document #558 Comment #60 - response continued

wells. For example, uranium concentrations average 0.008 mg/L and ammonia concentrations average 0.007 mg/L. These analytical results and an explanation of why selected wells were considered representative of background are provided in the SOWP (see Table 5−8 and Sections 5.3.5 and 5.3.4.3.).

The range in TDS concentrations in the background wells cited by the commentor is a result of natural variability. Mixing of fresh upgradient water with deeper saline water results in a background water quality that is highly stratified both vertically and horizontally across the site. This is described in the SOWP (see Section 5.3.4, Site Background Water Quality) and in the EIS (see Section 3.1.6.3).

DOE did consider using the water quality data from the Arches National Park Headquarters well (ARCHES1978) as representative of background water quality for the site. As stated in the SOWP (page 5−43): "…water from ARCHES1978 is considered representative of the water from the Navajo aquifer that provides recharge to the alluvial aquifer within Moab Wash." Furthermore, this water quality is summarized in the SOWP (see Table 5−8, Background Ground Water Quality for Wells Completed in Bedrock Formations and the Unconfined Alluvial Aquifer Upgradient of the Moab Site, and Section 5.3.4.1, Water Quality Influence from the Glen Canyon Aquifer). DOE agrees that ground water from the Glen Canyon bedrock formation that the ARCHES1978 well is screened across recharges the shallow alluvium in Moab Wash. As stated in the SOWP (Section 5.3.4.2): "…water quality results presented in a Piper diagram (see Figure 5−22 in the SOWP) indicates ground water from alluvial well RW-01 and bedrock well ARCHES1978 are similar in composition." For this reason, ground water from RW-01 is considered representative of background for the shallow fresh Qal Facies entering the site from Moab Wash. As stated in the SOWP (see Section 5.3.5.1), this fresh water quickly becomes mixed with more saline water as it enters the site, and the salinity increases with depth and distance from the freshwater source contribution from the Glen Canyon aquifer.

DOE did provide water quality information and locations in the SOWP for monitor wells M9 and M10 located in the Matheson Wetlands Preserve (see Section 5.3.1 of the SOWP for a description of water quality for these wells; see Plate 1 of the SOWP for their locations). An explanation of why these wells are considered representative of the brine Qal facies is also provided in the SOWP (see Section 5.3.5.3).

Also see responses to comments #6, #24, #25, and #40.
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Document #558 Comment #61 Commentor: Utah Department of Environmental Quality

38. Section 3.4.5.3: White Mesa Site Groundwater Quality – Still Under Investigation (p. 3−142) - the claim made that 20 years of monitoring shows the existing tailings cells have not effected local groundwater quality in the shallow aquifer is still a matter of investigation. Anomalous uranium concentrations have been detected downgradient of existing Tailings Cell 4A that IUC is required to examine and explain as a mandate of their State Ground Water Quality Discharge Permit (12/1/04 Utah Division of Radiation Control Statement of Basis, pp. 6−7). With regards to the on-going chloroform contaminant investigation, the company has not yet completed its Groundwater Contaminant Investigation Report required by an August 23, 1999 Utah Division of Water Quality Ground Water Corrective Action Order. Therefore, it is premature to conclude how many sources of chloroform actually contributed to the contaminant plume found along the eastern margin of the site.

Response:

The statement regarding 20 years of monitoring data is based on an IUC document (IUC 2003) that predated the more recent UDEQ investigation. The more recent UDEQ data that discovered the presence of the organic plume has been incorporated into Section 3.4.5.3.
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Document #558 Comment #62 Commentor: Utah Department of Environmental Quality

39. Section 4.1.1.1: Construction and Operations Impacts at Moab Site, Geology – Omission of River Migration – horizontal river migration has been omitted from this section. No mention is made regarding channel avulsion, or possible undercutting of the tailings pile by the river. Clearly, the river has significant potential to migrate horizontally and undercut the pile, as demonstrated by recent USGS river velocity and shear force modeling where it was demonstrated that a 100-year flood event could easily move medium sized (1.45−2.91 inch) gravel in the river's channel (see Kenney, Fig. 47 in Attachment 1, below). Certainly the finer grained silts and sands in the riverbank near the tailings pile would be even more prone to erosion under these conditions. Furthermore, higher river flow rates in a 500-year or larger flood, could move even larger particle sizes (ibid., Figs. 48 and 49). Also the presence of any channel scouring near the West Portal could also increase the rivers erosive power (ibid., Figs. 50, 53, and 56). Recent experience with 100+ year floods on the Santa Clara River system have shown that horizontal migration of the river's channel can be swift and dramatic. DOE must evaluate this geologic hazard in this section.

Also, the recent USGS river velocity modeling shows that the river channel areas prone to this erosion in a 100-year flood event are extensive, being 1,000's of feet long, and are found both near the pile and adjacent to the mill site area (Kenney, , Fig. 47, see Attachment 1, below). As a result the small riprap diversion wall proposed in Fig. 2−3 is insufficient in both length and particle size to protect the tailings pile from river migration.

Response:

See response to comment #1, item #1, regarding river migration.
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Document #558 Comment #63 Commentor: Utah Department of Environmental Quality

40. Section 4.1.3.1: Construction and Operations Impacts at Moab Site, Groundwater (pp. 4−6 thru 10) – several concerns are apparent from DOE statements made in this section, as follows:

A. Failure to Describe Long-Term Impact of Ammonia Salt Layer on Groundwater Cleanup Project (p. 4−8 and Figure 4−1) – the contaminant breakthrough curve shown in Figure 4−1 was based on a constant ammonia contaminant source term of 1,100 mg/l (DOE SOWP, pp. 6−11 and 12, and 7−23). However, by DOE's own estimates, the ammonia salt layer near the top of the tailings pile will be dissolved and transferred to the water table by infiltration seepage thru the on-site cover system. In turn, this seepage will then cause a 16-fold increase in the ammonia source term contamination applied at the water table (dissolved ammonia-nitrogen = 18,000 mg/l). Using DOE's estimates, this ammonia pulse would arrive at the water table about 1,094 years after cover construction (SOWP, pp. 6−11 and 12 and Fig. 6−3) and continue for about 440 more years or until the ammonia salt layer was depleted (DEIS, p. 4−7).

The impact of this ammonia pulse indicates that the 200-year break-thru curves found in the DEIS (Figs. 2−43 and 4−1), are not representative of the anticipated leaching of the ammonia salt layer leaching from the tailings pile, in that a second ammonia pulse will arrive at the water table after year 1,094. Because this pulse will then increase the ammonia contaminant source term by a factor of about 16-times, higher groundwater and backwater habitat concentrations should be expected, than those predicted by the DOE model. As a result, the DOE contaminant transport modeling (DEIS Figures 2−43 and 4−1) does not represent the anticipated long-term ammonia concentrations in the groundwater system. Consequently, DOE's predictions that only 75-80 years of active groundwater remediation are needed are biased and un-defensible. It also means that even if only 200 years of active groundwater remediation were required, that sometime after year 1,100, the delayed ammonia pulse could cause the need for a second phase of active remediation might need to be sustained for another 440 years in order protect the backwater habitat. During this second pulse of ammonia contamination, the groundwater cleanup costs could be as high as $396 Million (440 years time $900,000/yr). If this were the case, the price tag for the on-site option could easily be double that currently estimated by DOE.

However, the long-term effects of this ammonia salt layer inside the tailings pile become mute, if the tailings pile is relocated.

B. Applicable Groundwater Cleanup Standard (p. 4−9) – as discussed above the groundwater cleanup goal for ammonia-nitrogen needs to be the chronic standard (0.6 mg/l) and not the acute standard (3.0 mg/l). Use of this lower cleanup goal would necessitate DOE actively groundwater remediation for at least 120 more years, which in turn would significantly increase the total remediation cost for the project.

Response:

See response to comment #1, item #1, regarding river migration and engineering controls. See responses to comment #1, item #5; comment #2; and comment #6 regarding compliance standards and cost.
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Document #558 Comment #64 Commentor: Utah Department of Environmental Quality

41. Section 4.1.4.1: Construction and Operations Impacts at Moab Site, Surface Water (p. 412) – we disagree that the on-site stabilization option will only require 80 years of active groundwater remediation. For reasons discussed above this figure is at least 200 years, and may be as long 640 years after consideration of the ammonia salt layer that will be leached from the tailings pile at sometime in the future.

Response:

DOE's modeling of both the on-site and off-site disposal alternatives forms the basis of the 80-year performance prediction; however, DOE acknowledges the consequences of uncertainties in this modeling in Section 2.6.3 of the EIS and in Table 2−33, which could extend remediation time frames to those identified by the comment. Additionally, Section 4.1.3 explicitly discusses the time frames noted in the comment.

See responses to comment #1, item #5; comment #2; and comment #6.
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Document #558 Comment #65 Commentor: Utah Department of Environmental Quality

42. Section 4.1.5.1: Construction and Operations Impacts at Moab Site, Floodplains and Wetlands (p.4−13) – we disagree that the buried riprap wall shown in Figure 2−3 will be sufficient to protect soil in the floodplain and the tailings pile from the effects of river migration. Recent USGS modeling shows that the in-channel water velocity and shear forces are high enough during a 100-year flood event to erode particles as large as medium sized (1.45 – 2.91 inch) gravel (Kenney, Fig. 47, see Attachment 1, below). Even larger particle sizes can be transported by the river under higher flow events, or should the river scour its channel near the West Portal (ibid., Figs 48−49, and 50, 53, and 56, respectively). Certainly the finer silts and sands found on the riverbank and under the tailings pile are much more prone to erosion. In light of this recent USGS modeling, it is clear that any riprap wall design sufficient to protect the tailings pile would have to be 1,000's of feet long, extend across both the toe of the pile and the mill site area, and consist of very large diameter riprap in order to resist the projected erosive forces (ibid.). Design, construction and long-term maintenance costs for such a long riprap wall would be significant, and need to be factored into the total costs for the on-site option. Without such a robust erosion protection design, DOE should expect river migration and related erosion will adversely impact floodplain soils and the tailings pile.

Response:

See response to comment #1, item #1, regarding river migration and engineering controls.
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Document #558 Comment #66 Commentor: Utah Department of Environmental Quality

43. Section 4.1.6.1: Construction and Operations Impacts at Moab Site, Aquatic Ecology – Chemical Impacts (p. 4−16 and 17) – we strongly disagree with DOE's proposed groundwater cleanup goal for ammonia-nitrogen of 3.0 mg/l. As discussed in our comments on Chapter 2, above; only the chronic ammonia-nitrogen standard, 0.6 mg/l, is applicable to the backwater habitat. Also, DOE's assumption of a 10-fold dilution of ammonia at the groundwater to surface water transition is unsubstantiated. Until DOE can confirm this assumption thru time dynamic and representative field studies, the 0.6 mg/l ammonia-nitrogen standard must be applied as a groundwater cleanup goal.

Response:

See responses to comment #1, item #5; comment #2; and comment #6.
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Document #558 Comment #67 Commentor: Utah Department of Environmental Quality

44. Section 4.1.17: Disposal Cell Failure from Natural Phenomena (p.4−50 thru 56) – we disagree with several DOE statements made in this section, as follows:

A. Error in Slow, Passive River Migration Assumption (p. 4−50) – the DOE has simply understated the forces that control and govern river migration. Channel avulsion is a highly time dynamic process that can occur catastrophically over very short periods of time. Recent loss of more than 25 homes on the Santa Clara River in Utah over the course of just a few hours is a clear reminder of how swift and immense these forces can be. DOE's claim that river migration will always be a slow and easily controlled phenomenon is a tremendous show of hubris. Consequently, river migration must be considered as a part of a catastrophic upset of the tailings pile.

Response:

See response to comment #1, item #1, regarding river migration.
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Document #558 Comment #68 Commentor: Utah Department of Environmental Quality

44B. Need to Remediate Downstream Beaches (p. 4−54) – the DOE statements made on page 4−54 downplay the risk of radium-226 tailings contamination to nearby sandbars and beaches, and the impact of this pollution on the local tourism economy. From DOE calculations presented in Table 4−18 and the maximum sediment exposure level for camping provided in Table 4−19 (1,700 pCi/gm radium-226 in sediments), it would appear that only about 36% of the pile would need to be washed into the Colorado River before sand bar and beach sediments near the Moab site would meet this maximum camping exposure criteria for radium-226 [(1,700 pCi/gm / 944 pCi/gm)* 20%]. This is not a far-fetched scenario when you consider that the river has the ability to transport medium sized (1.45 – 2.91 inch) gravel under a 100-year flood event (see USGS modeling in Kenney, Fig. 47), and that large expanses of the local riverbank appear to be composed of sediments that are much finer (silts and sands). This possibility is also reasonable after you consider that: 1) larger river flows can transport even larger sediment sizes (Kenney, Figs. 48 and 49), and 2) the river's capacity to erode its riverbank and undermine the tailings pile is increased further, should the river scour its channel at the West Portal (see Kenney, Figs, 50, 53, and 56).

For sand bar and beach sediments below the Green River confluence, it would appear that only 66% of the tailings pile would need to be washed away in order for this same camping exposure criteria to be met [(1,700 pCi/gm / 515 pCi/gm)* 20%].

From this information it is clear that the loss of control of the tailings due to river migration would be a catastrophic failure scenario and would create an unacceptable exposure to downstream river recreation users and campers. It is also clear that such losses would require significant expenditure of public funds to capture and regain control of this contamination. Given the remote locations and difficult access to the impacted areas, the cost to cleanup the contaminated sandbars and beaches would be astronomical. Such loss would pose a lengthy and significant adverse impact on the local tourism economy. For all these reasons, it would be prudent to prevent the problem in the first place and relocate the tailings to a more stable location away from the Colorado River.

Response:

For the on-site disposal alternative, DOE has proposed armaments to the sides of the pile and a riprap wall that would prevent catastrophic failure from river migration or flooding of the Colorado River during the regulatory performance period of 200 to 1,000 years. Utilizing the recently released USGS study, riprap would be sized larger than that which could be moved by their predicted river velocities.

However, in spite of the highly unlikely probability of this failure, the effects of a flood and river migration under the on-site disposal alternative are analyzed in Section 4.1.17 of the EIS, from which the commentor derived the radium concentrations and percentages set forth in the comment. For catastrophic failure, DOE estimates that concentrations of contamination in backwater areas (that may be deposited in sediments) would depend on several factors. These factors would determine contaminant concentrations in sediments and represent maximum values as set forth in Table 4−18.

Document #558 Comment #68 - response continued

DOE also acknowledges that impacts would be more likely to occur from elevated levels of contaminants in sediments as compared to surface water, and projects that for some scenarios (e.g., residential use), risks would be above protective levels. However, based on the scenarios postulated in the analyses, the time of exposure to campers and rafters would be negligible, and therefore their risks would be low.

DOE has included the analysis of this highly unlikely event because it does provide the decision-maker valuable comparative information among the alternatives. However, because of planned engineering controls, the highly unlikely probability of the event, and the speculative nature of the failure analyses, costs associated with cleanup cannot be meaningfully estimated.
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Document #558 Comment #69 Commentor: Utah Department of Environmental Quality

44C. Error in Assumed Direction of River Migration (p. 4−55) – we strongly disagree with DOE's statement that the river can only migrate away from the tailings pile. Errors have been found in DOE's November, 2003 River Migration Report that prove that the Colorado River has migrated both towards and away from the tailings pile in the last several decades. For details regarding these errors we refer the DOE to comments provided by Dr. John Dohrenwend. Again, DOE's claim that the river can only migrate away from the tailings pile is a blatant insult of common sense.

Response:

The EIS states that "future lateral migration of the river will tend toward the east away from the pile." The EIS further states that an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment (see responses to comment #1, item #1, and comment #22).
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Document #558 Comment #70 Commentor: Utah Department of Environmental Quality

44D. Problem with Riprap Diversion Wall (pp. 4–55 and 56) – after review of the recent USGS river velocity and shear force modeling, it is clear that an extensive length of the river is prone to erosion under a 100-year flood event, and given the presence of fine grained silts and sands in the local riverbank and under the tailings pile (Kenney, Fig. 47, see Attachment 1, below). This same USGS modeling also showed that even larger sediment can be transported by the river, and even longer stretches of the river are prone to erosion, should higher flow events occur, or should the river scour its channel near the West Portal. This same modeling also demonstrated how the pile will impede river flow and create significant water velocity and shear forces near its southeast corner (ibid., Figs.32 and 33). Significant velocities and shear forces will also be generated in large areas across the mill site and in the floodplain near the tailings pile (ibid., Figs. 47, 48, and 49). All of these findings reinforce the conclusion that the small and limited riprap diversion wall shown in DOE Figure 2-is insufficient to control river migration. Instead, any riprap diversion wall that has any hope of controlling river erosion will need to be 1,000's of feet long and extend both along the toe of the pile and across the entire mill site area. Because the depth of the river will be great under the possible maximum flood (25 feet, Kenney, Fig. 19), the vertical extent of this riprap will also need to be great. The added costs for these erosion protection measures need to be incorporated into the on-site cost option. However, the need for such structures and erosion protection would be eliminated should DOE move the tailings pile.

Response:

See response to comment #1, item #1, regarding river migration and engineering controls.
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Document #558 Comment #71 Commentor: Utah Department of Environmental Quality

45. Section 7.1.2 Uranium Mill Tailings Radiation Control Act, 42U.S.C.§§ 7901 et. seq, as amended – as mentioned previously in comment 19A, Utah is now an Agreement State for regulation of uranium mill tailings under Title II of UMTRCA that includes the White Mesa Mill. Standards relating to the protection of groundwater at this alternative in the DEIS are found in Utah Water Quality rule, R317-6. As part of the amended Agreement, the Nuclear Regulatory Commission approved an "alternative groundwater standard" and the State of Utah uses its own groundwater protection rules in lieu of 40 CFR 192. Since Utah is an Agrement State, the White Mesa Mill must amend its current Radioactive Materials License to accommodate this disposal option as well as modify the facility's Ground Water Discharge permit. The EIS should be modified to reflect this state authority under Section 7.3.

Response:

Section 7.3 has been revised to include the state's newly granted status as the regulator of the White Mesa Mill operations and the need for the mill to amend its license.
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Document #558 Comment #72 Commentor: Utah Department of Environmental Quality

46. Section 7.3 State Regulatory Requirements – previously as stated in comment 12A, DOE has not recognized state groundwater authority under Utah Water Quality rule, R317-6. Under this state authority, DEQ has classified the shallow aquifer at the Moab Tailings Site as a Class 1C aquifer that needs protection in order to sustain a nearby wildlife habitat, that being the backwater area that is being fed by groundwater on the nearby banks of the Colorado River. There should be recognition of the state groundwater program in Section 7.3 because of the demonstrated authority in comment 20 even if DOE disagrees with the assertion of groundwater authority at the Moab Millsite.

Response:

DOE does not believe that the provisions of the State of Utah's Ground Water Protection Regulations (R317-6) regarding Class IC Ground Water (Ecologically Important Ground Water) are applicable:

(1) R317-6-3: 3.4 CLASS IC ECOLOGICALLY IMPORTANT GROUND WATER is a source of ground water discharge important to the continued existence of wildlife habitat. R317-6-4: 4.4 states that Class IC ground water will be protected as a source of water for potentially affected wildlife habitat. On the basis of historical contamination, and prior to DOE assuming responsibility of the site under the Floyd D. Spence Act for FY 2001, ground water beneath the site would not meet the criteria for this classification. In addition, the state has not provided evidence of this classification.

(2) The intent of the ground water regulations is to regulate discharges to ground water. Contaminated ground water is addressed under UMTRCA, as amended by the Floyd D. Spence Act. As such, the State of Utah understands that the site is subject to ground water remediation and is not applying for a permit to discharge to ground water. The release of historical contamination to ground water is currently being addressed by DOE, including the implementation of initial and interim actions.

(3) DOE is working with the USF&WS, UDWR, and other agencies to implement mitigative measures (e.g., interim actions) to reduce the effect of contaminants to ecologically sensitive areas. DOE believes these actions, combined with DOE's preferred alternatives to relocate the tailings to the Crescent Junction site and conduct active ground water remediation, meet the substantive intent of the Class IC ground water protection regulations.

For these resasons, DOE does not believe that revisions to Section 7.3 of the EIS are necessary. However, the state's opposing view on applicable compliance standards is discussed in Section 2.6.4.
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Document #558 Comment #73 Commentor: Utah Department of Environmental Quality

The Department of Energy (DOE) has not yet selected a preferred alternative. We offer the following remarks for their consideration in selecting a preferred alternative and preparing the final Environmental Impact Statement.

Response:

DOE has carefully considered the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS. Based on these considerations, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4.
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Document #558 Comment #74 Commentor: Utah Department of Environmental Quality

The UDWR and the Nature Conservancy jointly own the Matheson Wetlands Preserve and Waterfowl Management Area (WMA). This 900-acre property is just across the river and adjacent to the DOE property where the uranium tailings pile currently exists. This makes us one of the nearest neighbors to the site and heightens our concern about this project.

Response:

Several commentors, including cooperating agencies, have expressed concern over the proximity of the existing tailings pile to the Matheson Wetlands Preserve. DOE will consider this factor among others in its decision-making.
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Document #558 Comment #75 Commentor: Utah Department of Environmental Quality

The DEIS is clear that off-site disposal of the tailings pile is the best solution for improving water quality in the Colorado River and the adjacent Matheson Wetlands WMA. This conclusion is further verified in the Gardner/Solomon report. This independent study provides evidence that groundwater in the Moab Valley may move beneath the river (from the tailings pile south), potentially contaminating the WMA. It is also clear that the current tailings pile lies on a precarious foundation of sand and gravel which previous river meanders have inundated during the last millennia. Uncertainties discussed in the DEIS for on site disposal, in our opinion, may continue to jeopardize endangered fish, as well as water quality in the Colorado River and the WMA.

Response:

See response to comment #25.
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Document #558 Comment #76 Commentor: Utah Department of Environmental Quality

In addition, 100 and 500-year flood events could partially inundate the disposal cell if left in place. Armoring Moab Wash and the Colorado River to prevent this phenomenon could have detrimental impacts to river morphology, the WMA, and fish habitat, and it may prove ineffective. We support off-site disposal as the best long term solution for fish and wildlife.

Response:

DOE considered engineering controls that have proven effective and are in use at other remediation sites to mitigate environmental impacts, should the tailings be disposed of on the site. However, DOE concurs with the commentor that mitigation must consider site-specific factors (e.g., endangered fish, river migration) in developing remediation plans. The benefits of proposed remediation must be weighed against the impacts (i.e., contaminant effects on endangered fish) that currently exist. DOE believes that on-site stabilization with engineering controls would result in a significant improvement to endangered fish habitat and the aquatic environment in general.
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Document #558 Comment #77 Commentor: Utah Department of Environmental Quality

The Klondike Flat disposal site appears to be the most acceptable from a wildlife perspective. Because it is the shortest distance from the current tailings pile, its impact to wildlife from any of the transportation alternatives is minimized. Because of nearby existing disturbances (county landfill and airport), its proximity to important wildlife habitat is also comparatively negligible. We do recommend, however, the avoidance of any disturbance to white tailed prairie dog (a state sensitive species) colonies at this site and at all borrow areas.

Response:

DOE acknowledges the commentor's wildlife perspective and provides a similar perspective in Section 4.2.7 and Appendix A1. DOE will consider potential wildlife impacts and other factors such as long-term performance, visual impacts, constructability, and many others in its decision-making process. Further, all reasonable measures would be made to mitigate any unavoidable impacts to species of concern at the selected site and at all borrow areas, and DOE would continue to work closely with both state and federal wildlife officials in these efforts.
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Document #558 Comment #78 Commentor: Utah Department of Environmental Quality

The Crescent Junction disposal site would be the second best choice for wildlife. It is farther away (possibly imperiling more wildlife during materials transportation), and in closer proximity to important wildlife habitat in the Book Cliffs. It also lies within a belt of ferruginous hawk nesting and foraging habitat that skirts the Book Cliffs at the edge of the pinyon juniper vegetation zone. If this alternative is chosen, we suggest avoiding white-tailed prairie-dog colonies, and recommend surveys for kit fox and ferruginous hawks. All three of these species are currently identified as state sensitive species.

Response:

Sections 2.6 and 4.3.7.2 of the EIS acknowledge the increased risks to wildlife associated with transportation to the Crescent Junction site. Sections 3.3.9.2 and 3.3.9.3 acknowledge the potential presence of the ferruginous hawk (high potential) and the white-tailed prairie dog; Section 4.3.7.1 acknowledges the potential for impacts to these species. The EIS also states that impacts would be considered short-term and would not affect population distribution and abundance in the long term.

DOE considered the kit fox during development of the EIS. However, during cooperating agency review of previous EIS drafts, including the State of Utah, BLM, and USF&WS, no evidence was provided that this species may exist in this area. However, Section 4.3.7.1 commits DOE to conducting site investigations prior to site development if the Crescent Junction site were selected. If this species were present and were determined to be affected, appropriate mitigation would be implemented.
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Document #558 Comment #79 Commentor: Utah Department of Environmental Quality

The White Mesa Mill disposal site would be the most detrimental to wildlife. Because rail transportation is not an alternative to this site, truck transport or the slurry pipeline are the only other possibilities. Either of these options traverses miles of important habitat for many wildlife species. The slurry option to this site would also skirt Gunnison sage-grouse habitat near Monticello. Gunnison sage-grouse is currently a federal candidate for listing under the Endangered Species Act. Transportation to this site would necessitate crossing the Colorado River and many other perennial and ephemeral streams and washes. Truck transport to this site would increase deer and elk vehicle collisions and threaten other species of wildlife.

Response:

The impacts to wildlife associated with transporting the tailings to the White Mesa Mill disposal site are presented in Sections 4.4.6 and 4.4.7. Impacts to floodplains and wetlands are presented in Section 4.4.5 and are consistent with the commentor's observations.
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Document #558 Comment #80 Commentor: Utah Department of Environmental Quality

Railroad transportation to off site disposal areas would have the least impact to wildlife resources and habitat. The resulting increase in animal vehicle collisions from increased truck traffic on US-191 makes the trucking option undesirable. Truck traffic will substantially increase anyway, as borrow materials are transported under either action alternative. To truck the contaminated materials to an off-site disposal area would create an unnecessary risk to several high profile wildlife species including, desert bighorn sheep, mule deer, elk, Gunnison sage-grouse, golden eagles, white-tailed prairie dogs, and potentially black-footed ferrets (federally listed as endangered).

Response:

In the EIS, DOE acknowledges the potential for impacts to wildlife as a result of the truck transportation mode for all alternatives and will consider this issue in its final decision-making.
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Document #558 Comment #81 Commentor: Utah Department of Environmental Quality

The UDWR is concerned that the slurry option will cause unnecessary depletions in the Colorado River and further impact habitat for endangered fish species. Although such depletions are mitigated under the Upper Colorado River Endangered Fish Recovery Program, we recommend that this unnecessary impact be avoided by choosing another transportation alternative. The slurry option will also disrupt terrestrial wildlife habitat, especially if it is installed all the way to the White Mesa Mill site near Blanding.

Response:

DOE acknowledges the commentor’s concerns. Given the potential impacts to endangered species and wildlife associated with water depletion and the slurry corridor, DOE identified rail transportation as one aspect of its preferred alternatives.
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Document #558 Comment #82 Commentor: Utah Department of Environmental Quality

The DEIS discussion of borrow areas does not consider effects to wildlife and wildlife habitat. We suspect these borrow areas may include habitat for several state sensitive species including while tailed prairie-dog, kit fox, burrowing owl, and ferruginous hawk. Although it is likely that a site can be chosen which will not impact these species, the specific proposed sites should be surveyed for these species and the survey results should be discussed in the forthcoming final Environmental Impact Statement.

Utilization of the Floy Wash borrow area requires round-trip truck traffic on seven miles of Interstate 70. This is an area where golden eagles frequently collide with vehicle traffic, yet no discussion of impacts to golden eagles is made in the DEIS. Road improvements to borrow areas and the resulting impacts to wildlife are also not discussed or mitigated.

Response:

Descriptions of and potential impacts to wildlife and wildlife habitat at borrow areas are addressed in Sections 3.5 and 4.5 of the EIS and include many of the species listed in the comment. In Section 3.5, DOE commits to complete additional surveys as needed prior to final selection of borrow areas. These surveys would be conducted in consultation with the appropriate cooperating agencies, including USF&WS, UDWR, and BLM biologists. If species are present and may be affected, appropriate mitigation would be implemented.

With regard to the commentor’s concerns regarding collisions with golden eagles, Section 4.1.7.3 of the EIS (Construction and Operation Impacts Related to Transportation [to Crescent Junction]) includes a detailed discussion of the potential for collisions with bald eagles and notes that the bald eagle is the only federally listed species that could incur an increase in traffic-related mortality. The section concludes that the potential for increase in bald eagle deaths, while real, is expected to be small. While not specifically addressing golden eagles, the same factors limiting the potential increase in collisions with bald eagles would likely apply for golden eagles.
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Document #558 Comment #83 Commentor: Utah Department of Environmental Quality

Any alternative except the No Action alternative will apparently require some construction of electrical power lines. Any power line, no matter how small, should be constructed in such a manner that raptors or other birds cannot be electrocuted when using the power poles for perches or nest sites. There are several ways this can easily be accomplished. Perch preventors can be installed on power lines, and wires can be spaced in a manner that is safe for perching birds. Contact our office for details, if necessary.

Response:

DOE concurs with this concern and will continue to consult with the UDWR and USF&WS in developing mitigation measures to minimize impacts that may be created by the installation of power lines.
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Document #558 Comment #84 Commentor: Utah Department of Environmental Quality

The DEIS was vague about the process for diverting water from the Colorado River for any of the alternatives. There are pumping designs and procedures that can minimize the impact to endangered Colorado River fishes. We recommend procedures detailed in the recovery plan be followed and outlined in the forthcoming final EIS. This should include screens over the intake to prevent juvenile fish from being drawn into the pumps and destroyed.

Response:

Specifics concerning screens for intake systems are discussed in Section 4.1.6.1 and in Appendix A1−7.2. The measures for protecting aquatic organisms include a one-quarter to three-eighths-inch mesh screen on water intake structures. As mitigation plans are further developed in consultation with the USF&WS, procedures in the recovery plan would be considered to minimize impacts to aquatic organisms.
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Document #558 Comment #85 Commentor: Utah Department of Environmental Quality

Every discussion in the DEIS dismisses the possibility of black-footed ferrets. Although it is unlikely that ferrets have moved down into this area from release sites in Colorado and northern Utah, it is not impossible that indigenous ferrets could potentially be found in the Cisco desert. Habitat potential for the species should at least be considered. Anywhere there are prairie-dog colonies, there is potential black-footed ferret habitat.

Response:

Section 2.6 of the EIS and Section A1-9.2 (Appendix A1, Biological Assessment) identify the black-footed ferret as potentially occurring in the region of the Klondike Flats and Crescent Junction sites. DOE has consulted extensively with the UDWR and USF&WS concerning this species. The USF&WS concluded in its Biological Opinion (Appendix A3) that this species is "unlikely to be present."

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Document #558 Comment #86 Commentor: Utah Department of Environmental Quality

Both the Klondike Flats site and the Crescent Junction site and nearby borrow areas have the potential for burrowing owls, a state sensitive species. Anywhere there are existing or unoccupied prairie dog colonies, there is the potential for burrowing owls. This is misstated in the DEIS.

Response:

Table 3−34, which shows state-listed animal species that may occur in the vicinity of the Crescent Junction site area, acknowledges the possible presence of burrowing owls and their habitat. DOE does not dispute the commentor's general premise. However, based on cooperating agency reviews, including the State of Utah, BLM, and USF&WS, no objection was made to the general conclusions in the EIS regarding this species. However, DOE is obligated to protect all federal- and state-listed species. If this species is present and is determined to be affected under the selected alternative, appropriate mitigation would be implemented. Table 3−27, which shows state-listed animal species that may occur in the vicinity of the Klondike Flats site area, has been revised to be consistent with Table 3−34 with regard to this species.

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Document #558 Comment #87 Commentor: Utah Department of Environmental Quality

Kit fox is a state sensitive species with habitat and confirmed sightings in the vicinity of Klondike Flats and Crescent Junction. It should be added to the list of species that may occur at those sites and at nearby borrow areas.

Response:

DOE does not dispute the commentor's general premise. Based on cooperating agency reviews, including the State of Utah, BLM, and USF&WS, no evidence was provided that this species may exist in these areas. However, DOE is obligated to protect all federal- and state-listed species. Tables 3−27 and 3−34 have been revised to include this species as "possibly" present. If this species is present and is determined to be affected under the selected alternative, appropriate mitigation would be implemented.

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Document #558 Comment #88 Commentor: Utah Department of Environmental Quality

The UDWR appreciates the opportunity to review and comment on this important project. Notwithstanding the minor exceptions noted above, the DEIS was comprehensive, well written, and thoroughly researched. We hope to continue to work cooperatively with the DOE to implement this project with minimal detrimental impacts to fish, wildlife, and their habitats. Should you require further information, please contact Leroy Mead, habitat biologist, at our Price office.

Response:

DOE appreciates the compliment on the quality of its EIS and looks forward to continuing our successful relationship with UDWR in the implementation of its ground water remediation program and the disposal of tailings.
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Document #558 Comment #89 Commentor: Utah Department of Environmental Quality

The Division of Forestry, Fire and State Lands comments:

The Division of Forestry Fire and State Lands supports moving the tailings because of potential river migration that may breach containment under the on site disposal alternative.

Response:

See response to comment #1, item #1, regarding river migration. DOE will consider the Division of Forestry's view in its decision-making.
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Document #558 Comment #90 Commentor: Utah Department of Environmental Quality

The slurry pipeline to White Mesa Mill alternative is FFSL's least favored alternative for off-site disposal. The slurry pipeline would have to cross the Colorado River. A break in the slurry pipeline could result in discharge pipeline contents into the river, thereby adversely affecting sovereign lands and resources.

Response:

The impacts to floodplains and wetlands are presented in Section 4.4.5. Impacts associated with the transportation of the Moab tailings to the White Mesa Mill disposal site are presented in Section 4.4.5, and impacts to surface water bodies are presented in Section 4.4.4. Section 2.2.4 states that the pipeline system would include instrumentation that would detect leaks and shut the system down before a large quantity of material could be released. DOE estimates that less than 5.2 cubic yards (yd^3) would be spilled before system shutdown. Given this small quantity and the relatively low probability of such an accident, the adverse impacts to the local resources would be minimal and transient. However, DOE will consider the commentor's point of view in its decision-making.
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Document #559 Comment #1 Commentor: Rosson, Clay

Even though a preferred alternative was not listed in the Atlas Tailing's Pile DEIS, persuasive argument was made for removal of some material at the mill-site based on the information provided in the report. In the alternative of capping the pile, the EIS states that the pile will eventually subside and reach the water table. Will the increased pressure of capping increase the rate of subsidence? The EIS states that levels of contaminants to the river will be restored to flux rates equivalent to the previous groundwater levels once the base of the tailing pile comes into contact with the water table. An argument could be made that the pile would be left behind for future generations to remove with the addition of the material that would comprise of the proposed cap. This would make future removal even more expensive.

Response:

The rate of subsidence of the valley is related to the rate of dissolution of salts from the underlying Paradox Formation and not to any load resulting from activities at the Moab site (See Section 3.1.1.4). The EIS acknowledges that subsidence (Section 4.1.1.1) could result in adverse impacts to surface water quality many thousands of years from the present once the base of the tailing pile comes into contact with the water table. The cost of this distant future potential is not quantified in the EIS.
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Document #559 Comment #2 Commentor: Rosson, Clay

If we were mining and processing uranium in 2005, it would not be taking place on the bank of a major river. Therefore, the mess was left behind from a more naïve time in the 1940's where legal environmental constraints or the awareness of point source contamination did not exist, and the public had little knowledge of cancer or the effects of uranium and radon on human health.

Response:

DOE acknowledges the historic background on the placement of the uranium mill tailings at the Moab site.
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Document #559 Comment #3 Commentor: Rosson, Clay

Contaminants of concern listed in the Draft Report are not necessarily emphasizing radioactive metals, the source of radon and ammonia. The plumes of radionuclide and other metal contaminants reaching background levels within miles downstream may be misleading for reassuring the public. In the case of radionuclides, Grand County has many radioactively hot creeks and disturbed uranium mining areas along the Colorado River as well as radioactive geological layers that all combine to naturally and unnaturally increase the background levels in the river.

Document #559 Comment #3 - continued

Response:

DOE concurs with the commentor's statement that naturally occurring radionuclides, such as uranium, contribute to concentrations in the river above and below the Moab site. These naturally occurring concentrations are not related to the millsite. Any site-related constituent that is not detectable above this natural background concentration is not considered a contaminant of concern since it does not contribute to any incremental risk to human health or the environment.
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Document #559 Comment #4 Commentor: Rosson, Clay

Lake Powell and Lake Mead have been sinks in the their lake bed sediments for uranium and other metals for the past 50+ year lifespan of the tailings pile due to their anoxic depths. This could continue for hundreds or thousands of years if the pile is capped in place creating places where the pile will continue to increase the background radiation. The river system will continue to concentrate uranium processing metals as they are soluble in their mobile oxidative state and insoluble and immobile when reduced in anoxic waters of deep reservoirs. Sinks such as the reservoirs along the Colorado River will slowly increase their radiation in the depth of their lake beds. Any future disturbance of water flow as during prolonged drought and increasing demand on the waters of the Colorado River will at times create low water levels in the reservoir once again making the metals mobile downriver. Once the metals and other contaminants of concern are in the current in an oxidative state, any attempt at downstream remediation will not be cost effective. It should be said that the cheapest alternative may be removal of the pile because the true cost of leaving the pile on the bank or capping it in place may not be calculable in terms of future effects to human health or downstream remediation efforts.

Response:

The commentor's statement that the tailings pile would be a continuing source of contamination that would maintain contaminant concentrations at levels slightly above background concentrations in the ground water will be considered, along with similar comments, when DOE selects the disposal site and method in the Record of Decision.

Regardless of whether, in the Record of Decision, DOE ultimately decides to relocate the tailings pile or cap it in place, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements in 40 CFR 192.
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Document #559 Comment #5 Commentor: Rosson, Clay

I truly believe that any money spent on this site should be on removal of material from the pile and processing ponds rather than dumping more material at the site. Immediately spending $166 Million on material removal by truck would be a more effective means of re-contouring the pile, lessening the subsidence effect, and remediating the hottest areas like processing ponds which are creating larger contaminant plumes than the pile itself. Taking the barrels of materials out of the pile could also be done in this first stage. Another important step would be to remove a portion of the pile likely to be in contact with the river at higher flood stages.

The DOE should choose the least expensive option of moving the materials by truck to Klondike Flats, and setting up a disposal cell removing as much material as can be for the $166 Million. A smaller pile can be recontoured, vicinity properties can be remediated, and processing sites adjacent on the mill site can be excavated to the Klondike Flats location. The most important first action would be to make the biggest impact on the site for the least amount of money in the same fashion as the Interim Groundwater Remediation has provided----the biggest effect for the money available. We have a window of opportunity at this time with all the current political momentum to give this site and the river some relief.

Response:

The comment suggests partial removal of the tailings to Klondike Flats as a cost-effective alternative. DOE does not consider development and long-term maintenance of two disposal cells for the Moab tailings to be a cost-effective solution, nor would this approach likely reduce the technical uncertainties discussed in the EIS regarding on-site disposal.
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Document #559 Comment #6 Commentor: Rosson, Clay

Six or seven years ago this pile was not in the media, papers, or discussed amongst politicians. It had only been the subject of scientific studies yet not a part of public discourse. The public was not informed about the nature of this site whether locally or nationally. Information was not readily available about the Atlas Tailing Pile. The pile is no longer a mystery.

I want to thank the DOE office of Grand Junction for providing information for the law makers, and state and federal agencies as well as the public to weigh in on the fate of this site. I still believe that this site should be completely remediated without regard to cost because the awareness to do so in the past did not exist. This is a vestige of the atomic age and military endeavors, and it is all our duty to our national heritage to make sure that this land that we have inherited is not destroyed at the same time that it is defended with nuclear arms and powered by nuclear energy. Moreover, this site is violating the Clean Water Act as it is impairing a water body and Endangered Species Act. There will not likely be a chance to meet TMDL criteria at the Cane Creek location as stipulated by the Utah Department of Environmental Quality in the future if the complete pile is capped in place or the No Action alternatives are followed.

Response:

DOE acknowledges the commentor's support of the off-site disposal alternative. This comment will be considered, along with similar comments, when DOE selects the disposal site and method. See response to comment #4.
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Document #559 Comment #7 Commentor: Rosson, Clay

The Atlas Tailings pile is within the watershed of the Colorado River. As part of the eventual comprehensive watershed plan that will be developed for protecting the Colorado River in the upper basin states, sensible efforts should be made to mitigate sites such as this mill site, as well as mining sites just upriver, and the tailings pile submerged beneath Lake Powell to their effects on water quality. Materials should be removed from the mill site not brought to the mill site. If the pile is to be capped, I believe that some of the worst materials should be removed completely from the site first as mentioned. The pile could be recontoured only after the core of highly contaminated sediments and slimes have been removed. Much of the pile near the river would be scaled back away from flood stage and determined if it should be removed from site or relocated on-site. A plan to satisfy all parties for now would be to remove the hottest materials and sources of pollution, and evaluate the next steps once these initial goals were accomplished and plumes re-characterized.

Response:

Uranium mines and the mill at Lake Powell are beyond the scope of DOE's responsibility and this EIS. See response to comment #5.
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Document #560 Comment #1 Commentor: Carlson, Virginia

I am a resident of Moab, Utah and live a few miles away from the tailings pile. I drive by the pile several times a week and am often downstream of the pile. For the following quality of life issues I support moving the tailings pile north of its present location either to Klondike Flats or Crescent Junction.

1. The pile is located in a very scenic area bordering both Arches National Park and the Colorado River. The pile is visually ugly and greatly distracts from the beautiful vistas. Residents of Moab should not have to live with this visual impairment just because the current location of the pile was convenient during the uranium era.

Response:

Because of public comments and the results of analyses provided in the EIS (including consideration of the consequences of the uncertainties), DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.
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Document #560 Comment #2 Commentor: Carlson, Virginia

2. If all or part of the tailings pile was undermined by high waters of the Colorado, the economic impact on Moab would be catastrophic. It would also put downstream river users (including me) at risk for an unknown number of years.

Response:

In Section 4.1.17, the EIS discusses potential impacts (risks) to downstream users in the highly unlikely event of a disposal cell failure. The commentor's concerns will be considered in DOE's final decision-making.
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Document #560 Comment #3 Commentor: Carlson, Virginia

3. The Colorado River is one of the great rivers of the west and it must be taken care of. Leaving a large tailings pile on its flood plain does not make any kind of sense.

Response:

The commentor's point supporting off-site disposal will be considered, along with similar comments, when DOE selects the disposal site and method in the Record of Decision.

Regardless of whether, in the Record of Decision, DOE ultimately decides to relocate the tailings pile or cap it in place, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements in 40 CFR 192.
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Document #560 Comment #4 Commentor: Carlson, Virginia

4. All cooperating agencies have agreed that the best long term solution is to move the tailings pile.

Response:

DOE recognizes and acknowledges the positions of its cooperating agencies on the preferred surface remediation alternative and will continue to consider their positions as DOE finalizes its decision.
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Document #560 Comment #5 Commentor: Carlson, Virginia

5. I have been near the pile during the spring winds and have seen dirt and dust blow from the site.

Response:

DOE recognizes the importance of controlling fugitive dust emissions from the Moab tailings pile. In accordance with Utah State Air Quality regulations (Utah Administrative Code, Section R307-205, Emission Standards: Fugitive Emissions and Fugitive Dust), DOE has prepared the Fugitive Dust Control Plan for the Moab, Utah, UMTRA Project Site (DOE 2002a). This plan outlines the engineering, procedural, and administrative controls that DOE has implemented at the Moab site. In accordance with the plan, DOE attempts to maintain all visible dust emissions to 20-percent opacity (the state standard for visible emissions) or less. This is accomplished primarily by implementing various dust suppression controls such as using water trucks to apply water to on-site traffic areas, spraying soil stabilizers such a magnesium chloride to create a “crust” on the exposed soil surfaces, restricting vehicle traffic to designated routes, and limiting vehicular speed.

The problem of fugitive dust is not limited to the Moab mill tailings site; dust emissions and suspended airborne particulate matter are a region-wide problem that has been exacerbated by several years of ongoing drought conditions in the Four Corners area. UDOT and BLM are studying the problem, including motorist safety impacts associated with severe dust storms that have been occurring along SR-191 and the I-70 corridor over the past several years. DOE also recognizes that dust emissions resulting from any of its activities must be controlled to the greatest extent practical.

Off-site radioparticulate monitoring data indicate that any dust leaving the Moab site boundary does not exceed thresholds established for public exposures to the radioisotopes that are commonly associated with uranium mill tailings. In other words, the material that does occasionally become airborne and is visible at the mill site boundary consists primarily of fine soils (sand) and other surface materials, not mill tailings.
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Document #560 Comment #6 Commentor: Carlson, Virginia

A. Page S−41 Consequences of Uncertainty;

9. If river migration and encroachment were to occur to a great degree, significantly lessening the transport distance from the disposal cell to the river, surface water ammonia concentrations and concentrations of other contaminants of concern could revert to nonprotective levels, and additional engineered remedies or pile relocation could be necessary to meet UMTRCA requirements, potentially increasing program costs by tens to hundreds of millions of dollars. At the extreme, perpetual treatment or mitigation might be required, or the pile would have to be relocated after all on-site reclamation efforts and costs had been committed.

Since the historical tracking of the river is for a very short time frame (100+ years) and the DEIS is supposed to provide a 200-1,000 year solution, the DOE has not proved that leaving the tailings on the bank of the Colorado River is a safe long term solution. Both the State of Utah and the USGS disagree with conclusions use in the DEIS that the Colorado River is migrating away from the tailings pile. Since there is major disagreement among scientists and engineers, and since a miscalculation by DOE could result in moving the pile after it is stabilized at an enormous increase in costs, then a reasonable solution is to move the pile, not cap it in place.

Response:

DOE's analyses support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame.

There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these views (Section 2.6.4). The discussion includes the significance of flows from Courthouse Wash and Moab Wash into the river. To mitigate potential river migration under the on-site disposal alternative, DOE would include a barrier wall as discussed in Section 2.1.1.1. Also, see response to comment #3.
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Document #560 Comment #7 Commentor: Carlson, Virginia

B. Page S−41 Consequences of Uncertainty;

10. If 20 to 80 percent of the tailings pile were washed into the river, it would have serious adverse impacts on the riparian plant and animal life and would affect the health and safety of residents along the river and of river guides who may spend up to 50 days on the river in a given year. Such a flood event could also affect the tourist economy of Moab if users of the river corridor avoided the area after such an event.

Response:

The catastrophic failure analyses (Section 4.1.17) were done as a screening tool to inform decision-makers of the possible differences among the on-site and off-site disposal alternatives, even though DOE believes that there are no plausible mechanisms for such a failure. Some impacts to riparian and animal life would occur. River guides would be exposed to lower concentrations than those assumed for the camping scenario, although the length of exposure would be greater. The camping scenario reflects the risks associated with contaminated soils and surface water that would exist immediately adjacent to the tailings pile on the bank of the Colorado River shortly after cell failure. Two days of exposure were used because it is unlikely that any one camper would repeatedly camp at a location adjacent to the tailings pile after a failure when there are numerous, more favorable camping areas elsewhere. More favorable camping areas located downstream (including those sites that are closer to the Moab site) would have lower contaminant concentrations, thus mitigating the impact of increased usage.

DOE agrees that there is, and would likely continue to be, substantial recreational use downstream of the Moab site. However, when estimating risk, the additional use does not compensate for the significant decrease in contaminant concentrations in these downstream areas. When estimating risk, an increase in the contaminant concentration (or exposure point concentration) is directly proportional to the exposure duration. For example, the estimated dissolved uranium concentration listed in Table 4−17 for 80-percent release at the Moab site is approximately 333 times Lake Powell concentrations. For exposure pathways involving water ingestion, the exposure duration would need to be 333 times greater (666 days per year [2 days' duration for camping times 333], which is greater than the 365 days per year that are available) at Lake Powell compared to the Moab site to account for this difference in exposure point concentrations. Concentrations would begin to drop immediately downstream of the site, so this same type of effect (to a lesser degree) would also occur for camping sites closer to the Moab site. Risks from gamma exposure from these materials compared to the risks estimated in Section 4.1.17 would be minimal, mostly because the materials would mix with, or receptors would be shielded by, water and uncontaminated sediments.

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Document #560 Comment #8 Commentor: Carlson, Virginia

There was no suitability study done before the tailings pile was located on the banks of the Colorado River. This location was not selected for any reason other than convenience for transportation for uranium mining. The DEIS contains no proof that the current location is appropriate for long term storage of toxic materials. Again a prudent and reasonable conclusion is to move the tailings pile. If the tailings pile were washed into the river, the DEIS contains no discussion on how the river banks could be cleaned up which makes one come to the conclusion that the river banks could never be made safe for use in the foreseeable future.

Response:

Chapters 3.0 and 4.0 of the EIS present site-specific technical data to support DOE's position that on-site disposal is a reasonable alternative. In Section 4.1.17, DOE evaluated the environmental impacts associated with the highly unlikely event of catastrophic disposal cell failure. However, given the engineering controls for the on-site disposal alternative and the velocities of the worst-case floodwaters, the likelihood of catastrophic failure and the need for remediation are so remote that detailed quantification of these impacts is not included in the scope of the EIS.
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Document #560 Comment #9 Commentor: Carlson, Virginia

C. COSTS. I have tried to reconcile the costs quoted in the management summary and from Pages 2−180 and 4−40. It appears that the costs in the management summary do not reflect the total costs of any of the options. The EIS must state clearly the costs of EACH option and must provide backward compatible tables so that a reasonably adept person can review the cost tables for errors and omissions.

Response:

Cost information in the Summary has been clarified to include both surface and ground water remediation costs as detailed in Section 2.7.3.
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Document #560 Comment #10 Commentor: Carlson, Virginia

D. MOVING OTHER TAILINGS PILES. I understand that there were 22 tailings sites located near rivers. For all others it was deemed appropriate to move them. That is overwhelming evidence that Moab Tailings pile should also be moved away from the Colorado River banks. The DEIS did not specifically discuss remediation of other riverbank sites in the DEIS. Remediation of similar sites must be included.

Response:

The NAS recommended that DOE use the same protocols at the Moab site that have been used at other UMTRCA sites. DOE considered numerous factors in its decision to move tailings piles out of floodplains at other such sites, among them the potential effects (positive and negative) to floodplains and wetlands. These same considerations at the Moab site contributed to DOE's identification of the Crescent Junction site as its preferred disposal location.

Discussing remediation of other sites that have been completed under other EISs was outside the scope of this EIS. Each site must be evaluated independently from other sites because conditions differ. This is also consistent with the programmatic EIS and Record of Decision prepared for ground water remediation at all UMTRCA sites.
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Document #560 Comment #11 Commentor: Carlson, Virginia

E. US GOVERNMENT RESPONSIBILITY. The US Government has a responsibility to clean up toxic materials that it caused. Clean up does not mean capping in place on a flood plain.

Response:

Under the Floyd D. Spence National Defense Authorization Act for FY 2001, Congress assigned DOE the responsibility for remediation of the Moab site. Under NEPA, DOE also has the responsibility of evaluating all reasonable alternatives in an EIS before making a final decision. DOE believes that on-site disposal is a reasonable alternative and, for that reason, analyzed it in this EIS.
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Document #560 Comment #12 Commentor: Carlson, Virginia

F. GROUND WATER. It is stated in the DEIS (page S−9) that "Ground Water Remediation ? Cost $10.75 million for design and construction and $906,000 annually under both on-site and off-site disposal alternatives ? 75 to 80 years to complete under either on-site or offsite disposal alternatives

This does not make any sense. Ground water remediation should not cost the same for a large pile left on the site versus the remediation of "leftover" dirt after moving the tailings. The DOE did not include information that supported this theory. It also does not make any sense remediation should take 75−80 years whether of not the tailings pile is moved. If the pile is not moved, remediation should take much longer.

Response:

Because the existing contamination beneath the pile in the ground water and brine is the largest source of continuing contaminant release, the contribution from the pile would require only 5 additional years of predicted ground water remediation. Details and assumptions used in the flow and transport modeling are presented in Section 7 of the SOWP. DOE is confident that the assumptions used to predict the remediation time frames and costs are reasonable and sufficient for evaluation of alternatives in this EIS. DOE acknowledges there are uncertainties related to the remediation time frames and costs; these are addressed in Tables S−1 and 2−33, item # 1.
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Document #560 Comment #13 Commentor: Carlson, Virginia

G. WIND AND FLOODING. The DEIS assumes that if the Colorado River had a major flood, the waters would be slow moving and flood the lowlands near the current site. What was not mentioned that if the river did this type of flooding, once the flood receded, the dried residue would become airborne during spring winds, which are strong and constant over the entire Colorado Plateau.

Response:

In Section 4.1.3.1, the EIS acknowledges the potential for flooding of the tailings pile if the on-site disposal alternative were selected and quantifies the impacts that could result from such inundation. These impacts would include additional leaching of contaminants into the ground water and subsequent migration to the river. If on-site disposal were selected, the disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly. Section 4.1.17 in the EIS addresses impacts from a catastrophic cell failure. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if on-site disposal were selected.

DOE believes the design and construction of an on-site disposal cell would effectively prevent floodwaters from mobilizing contamination in amounts sufficient to form a residue that would pose a health risk due to remobilization by wind.
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Document #560 Comment #14 Commentor: Carlson, Virginia

H. REASONABLE SOLUTIONS. The purpose of a DEIS is to discuss reasonable solutions to a problem. There is nothing reasonable about a proposal of using slurry to White Mesa. Why was this alternative even included? Or if it had to be included, why didn't the DOE state that it was not a reasonable alternative as they did on storing the wastes in empty salt mine caverns?

Response:

The EIS identifies the White Mesa Mill site as a reasonable alternative under NEPA that could meet the requirements of 40 CFR 192. This site is considered a reasonable alternative for three main reasons: it is technically feasible; it could provide the benefit of co-location of uranium mill tailings wastes; and the associated impacts may have the potential to be mitigated in an acceptable manner. The bases for excluding the mined salt caverns are identified in Section 2.5.2; essentially, this disposal option would rely on an unproven approach for uranium mill tailings disposal that would require immense amounts of water (880 million gallons of water per year for 20 years). This is not the case for the White Mesa Mill alternative, which would rely on a conventional and proven technological approach.
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Document #560 Comment #15 Commentor: Carlson, Virginia

I. UPRIVER DAM FAILURE. I did not see an analysis of the result of a possible dam failure up river from the Tailings pile except in the Consequences of Uncertainty. A detailed analysis of the upriver dams must be prepared if the DOE wishes to select a Cap In Place Alternative.

Please remember, we are neither smart enough nor strong enough to beat “Mother Nature”. The only prudent decision is to move the tailings pile out of the path of potential flooding.

Response:

DOE did not analyze specifically the sudden release of water from the dams upstream of the Moab site but did analyze the impacts of a catastrophic flood (300,000 cfs), which is the NRC-specified PMF. DOE determined that such a flood would not have sufficient force to cause failure of an on-site disposal cell with engineered mitigation measures such as side slope armaments. However, for purposes of comparative analysis in the EIS, DOE assumed that a highly unlikely failure occurred and quantified the impacts in Section 4.1.17. This is one factor among many that will be evaluated when DOE selects the disposal site and method in the Record of Decision. Also, see response to comment #3.

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Document #567 Comment #1 Commentor: Lynch, Robert, Esq.—Irrigation & Electrical Districts Association of Arizona

We are pleased to write to you to support your efforts to identify a strategy for removal of the Moab uranium tailings pond near the Colorado River in Utah. Your draft EIS identifies that the tailings pond itself is partially located within the 100-year flood plain of the Colorado river. Additional sites likely contaminated around the tailings pond are also more extensively included in the 100-year flood plain.

Response:

To clarify, the tailings pond was eliminated before DOE assumed ownership of the Moab site and the tailings pile. DOE assumes the commentor is referring to the tailings pile.

DOE's efforts have not focused solely on identifying a strategy to remove the tailings pile. Off-site disposal (removal) of the tailings pile is evaluated in the EIS together with on-site disposal (cap in place). Portions of the site lying in the 100- and 500-year floodplains of the Colorado River are shown in Figure F−1.
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Document #567 Comment #2 Commentor: Lynch, Robert, Esq.

It seems to us who rely on the Colorado River downstream of this potential disaster that the only sane thing to do is to move the tailings pond out of both the 100-year and 500-year flood plains of the Colorado River. We will not comment on which of the ultimate destinations is best nor will we comment on the various methodologies you have identified for moving the tailings pond. Suffice it to say that any strategy for leaving the tailings pond in place is, in our view, not worthy of further consideration in this EIS. This is a ticking time bomb and it is only a matter of time before it goes off.

Response:

Based on the analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.
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Document #567 Comment #3 Commentor: Lynch, Robert, Esq.

Additionally, we are pleased to note that the Department of Energy proposed budget for fiscal year 2006 contains a significant increase in investment in dealing with this problem. The $26 million proposed for this effort will go a long way toward meeting the ultimate requirement of nearly a half billion dollars for accomplishing this critical environmental cleanup.

Response:

Comment noted.
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Document #567 Comment #4 Commentor: Lynch, Robert, Esq.

Thank you for consideration of our views. Please keep us advised of further developments in this Environmental Impact Statement process.

Response:

DOE appreciates the commentor's participation; as a participant, the commentor will be provided a copy of the final EIS and the Record of Decision.
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Document #568 Comment #1 Commentor: Weisheit, John

Living Rivers, Colorado Riverkeeper, Colorado Plateau River Guides, River Runners for Wilderness and Colorado Outward Bound West submit the following comments concerned with the Draft Environmental Impact Statement (DEIS) for the Moab Uranium Mill Tailings. Collectively our mission statements promote protection of the natural and cultural heritage of rivers. We would like to thank the Department of Energy (DOE) for their efforts to prepare this DEIS for public review and appreciate this opportunity to participate.

Response:

DOE appreciates the significant involvement and contributions that the public, organizations, and agencies have made to this EIS effort.
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Document #568 Comment #2 Commentor: Weisheit, John

It is our position that the Moab Mill's tailings pile be moved by the existing railroad to an off-site disposal area in the Mancos shale deposits north of Moab. We agree with the Environmental Protection Agency that the Off-Site Disposal Alternative at Crescent Junction is superior to the disposal alternative at Klondike Flats. The site at Crescent Junction is more isolated from human activity, has a thicker deposit of shale and is more protected from the agents of erosion.

Response:

The commentor's preferences are noted. Sections 3.2 and 3.3 describe the affected environments of the Klondike Flats and Crescent Junction sites, and Sections 4.2 and 4.3 identify the impacts and consequences of the alternatives for each site, including the rail and other transport modes. All these data have been included to support decision-making.
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Document #568 Comment #3 Commentor: Weisheit, John

It is also our position that the ground water pollution from the Moab Mill site should be remediated to successfully remove all jeopardy to the threatened and endangered species of the Colorado River downstream, including the wetlands of the Moab Sloughs. We are convinced that this can not be accomplished by leaving the pile capped on-site and adjacent to the Colorado River.

Response:

It is DOE's position that either the on-site or the off-site disposal alternatives can be protective of human health and the environment with active ground water remediation. DOE and UDEQ have opposing views regarding the ammonia surface water standard (protective criteria) for a ground water cleanup goal that was used in the EIS. The EIS has a new section (Section 2.6.4) to present and discuss the responsible opposing views of UDEQ and others. The basis for the ammonia surface water standard for a ground water cleanup goal used in the EIS is discussed in Section 2.3.1 and was developed in consultation with the USF&WS as specified in the Endangered Species Act. USF&WS states in its Biological Opinion (Appendix A3 of the EIS): "The FWS has considered all of UDEQ's comments in our analysis of the effects to listed species associated with ground water remediation and we agree that many warrant further study (see Incidental Take Statement). Based on our review of the available information, and with recognition that there are uncertainties in both DOE's and UDEQ's analyses, the Service has determined that DOE's premise that 3 milligrams per liter (mg/L) ammonia in groundwater will result in protective concentrations in all surface water habitats presents a reasonable approach to the problem."
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Document #568 Comment #4 Commentor: Weisheit, John

Our position also includes moving the pile off-site to eliminate future risks to human health for residents of developed areas along the Colorado River downstream, and to the visitors of federally protected public lands downstream. These public lands include the national parks at Canyonlands and Grand Canyon, the national recreation areas at Glen Canyon and Lake Mead, and the wildlife refuges of the Lower Colorado River Complex. This also includes the water users identified by the Colorado River Compact, specifically Arizona, Nevada, California and the Republic of Mexico.

Response:

DOE appreciates the comment and, after consideration of the EIS analyses, the uncertainties evaluated, other public comments, and agency comments, has identified off-site disposal at Crescent Junction and active ground water remediation as its preferred alternatives. DOE will consider this comment in its final decision-making.
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Document #568 Comment #5 Commentor: Weisheit, John

It is also our position that the White Mesa Mill Alternative in San Juan County should be abandoned for the reasons stated by the Ute Nation from the White Mesa Reservation, as presented to the DOE at the public meeting held there on January 27, 2005. This alternative will affect the Ute Nation's quality of life and their values concerning the protection of their culture heritage and their sacred sites.

Response:

The environmental and cultural resource impacts under the White Mesa Mill alternative are identified in Section 4.4 of the EIS. Section 3.4.18 identifies the demography of minority populations in the White Mesa area. DOE has consulted with several tribes in the region, including the Ute, Hopi, and Navajo, to identify all cultural resources and traditional cultural properties for each alternative. In addition, the tribal and public comments received as part of the NEPA process are important to this decision-making process.
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Document #568 Comment #6 Commentor: Weisheit, John

The DOE must also acknowledge the official position of the City Council of Moab and Grand County Council, which have identified the Off-Site Disposal Alternatives at either Klondike or Crescent Junction as superior. This alternative will meet the objectives and goals of the local citizens in order to remove them from environmental and social harm.

The members of our organizations that live in Grand County strongly object to moving the toxic contents of the Moab Mill site to any other county in Utah. This is a Grand County problem and the impacts from these toxic materials should not be passed on to our neighbors in San Juan County.

Response:

DOE has acknowledged the official positions of the City Council of Moab and the Grand County Council, which have identified off-site disposal at either Klondike Flats or Crescent Junction as their preferred surface remediation alternative.
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Document #568 Comment #7 Commentor: Weisheit, John

2. The DOE is unsuccessful in removing doubt concerning the compromise of the On-Site Disposal Alternative during a probable maximum flood.

We are convinced that the tailings pile at the Moab Mill must be moved away from the Colorado River because the suggested reasons identified with the On-Site Disposal Alternative in the DEIS are, at best, speculative.

Response:

DOE analyzed the impacts of a catastrophic flood (300,000 cfs, which is the NRC-specified PMF) and determined that such a flood would not have sufficient force to cause failure of an on-site disposal cell with engineered mitigation measures such as side slope armaments. However, for purposes of comparative analysis in the EIS, DOE assumed that a highly unlikely failure occurred and quantified the impacts in Section 4.1.17. The impacts will be one factor among many to be evaluated when DOE selects the disposal site and method in the Record of Decision.

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192 and that the cell would comply with the minimum maintenance standard. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.

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Document #568 Comment #8 Commentor: Weisheit, John

a. The Moab Mill site was originally chosen for reasons of convenience and not for reasons of providing long-term environmental protection from the consequences of historic flooding along the Colorado River.

Response:

The EIS acknowledges the potential for flooding of the tailings pile if the tailings were capped in place and quantifies the impacts that could result from such inundation. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in Section 2.1.4, an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of a catastrophic failure of an on-site disposal cell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if this alternative were selected.

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Document #568 Comment #9 Commentor: Weisheit, John

b. The federal government has already moved uranium waste piles away from the floodplains of the Colorado River and its tributaries and it is reasonable to expect the federal government to remain consistent with this precedent.

Response:

The NAS recommended that DOE use the same protocols at the Moab site that have been used at other UMTRCA sites. DOE considered numerous factors in its decision to move tailings piles out of floodplains at other such sites, among them the potential effects (positive and negative) to floodplains and wetlands. These same considerations at the Moab site contributed to DOE's identification of the Crescent Junction site as its preferred disposal location.
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Document #568 Comment #10 Commentor: Weisheit, John

c. Independent scientists have demonstrated that it is reasonable to suggest that Colorado River flooding may compromise the Moab Mill's tailings pile during a probable maximum flood in the next 200 to 1000 years. That ground water remediation may not be geologically feasible with the pile capped in place. These scientists are associated with the National Academy of Sciences, U.S. Geological Survey and academics from the state universities at Salt Lake City and Tucson.

Response:

DOE disagrees with the commentor that ground water remediation would not be possible under the on-site disposal alternative. In fact, ground water remediation has already begun as an interim action. Also see response to comment #7.
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Document #568 Comment #11 Commentor: Weisheit, John

d. The Bureau of Reclamation manages high dams, both concrete and earthen, on the Gunnison and Dolores rivers. These dams will likely be decommissioned in the next 200 to 1000 years. At some point in this time-period these dams will no longer provide flood control for the downstream environment. It is also possible that, as these dams age and fill with sediment, the spillway mechanisms will experience flood flows greater than the original design specifications, which could result in a possible catastrophic breach that could subsequently compromise a tailings pile capped in place at Moab Valley.

Response:

See response to comment #7. In addition, the assumed PMF would likely exceed the energies of water released from a dam failue.
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Document #568 Comment #12 Commentor: Weisheit, John

e. The threat of flooding that could compromise the On-Site Disposal Alternative is significant when considering the intent behind the legislation for protection of downstream resources. This legislation includes the National Park Service Organic Act, the National Historic Preservation Act, the Clean Water Act, the Rivers and Harbors Act and the Endangered Species Act. This would also include Executive Orders such as #11990 (wetlands protection) and #13007 (sacred sites).

Response:

Chapter 7.0 of the EIS (Regulatory Requirements) lists the laws, regulations, executive orders, and guidance that are or may be applicable to the alternatives analyzed in the EIS and that are critical to the decision-making process. Also see response to comment #8.

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Document #568 Comment #13 Commentor: Weisheit, John

3. The DOE must ensure consultation with the work performed by the University of Utah at Salt Lake City and the University of Arizona at Tucson

We request that all findings from Mr. Phil Gardner and Mr. Kip Solomon, at the University of Utah at Salt Lake City, be included as a part of the public record for the Final Environmental Impact Statement (FEIS). These studies indicate that ground water remediation at the Moab Mill site would best be served by moving the pile from the river.

We also request that all findings, pending the completion of work now being performed by Mr. John Dohrenwend and Mr. Victor Baker from the University of Arizona at Tucson, be considered as part of the public record for consideration by the FEIS. These studies will concern itself with the effects of a probable maximum flood at the Moab Mill site and would serve as a valuable exercise in the peer-review process of DOE's contractor-based science and engineering reports that are deemed speculative.

We would also request that the work already completed by Mr. Dohrenwend be submitted as part of the public record for the FEIS. Mr. Dohrenwend's reports were recently published in the Times-Independent, the weekly paper of Grand County. By using existing photographic evidence from over-flight and satellite imagery, Mr. Dohrenwend has demonstrated that the findings of the DOE contractors concerning river migration are speculative and that a reasonable doubt does exist to conclude that the Moab Mill site could be compromised by a probable maximum flood.

Response:

As a result of input developed in the public comment process and consultations with the 12 cooperating agencies, DOE has identified three general topics on which there exist responsible opposing views to the Department's position regarding the remediation alternatives for the Moab site: river migration, contaminated ground water flow under the river to the Matheson Wetlands Preserve, and the appropriate compliance standard for aquatic species in the river. Section 2.6.4 summarizes the opposing views on these topics and includes the work performed by the University of Utah and the University of Arizona.

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Document #568 Comment #14 Commentor: Weisheit, John

4. The DOE must ensure consultation with applicable federal agencies

The DEIS is not thorough because consultation with the Bureau of Reclamation (Bureau) was not sought in an official capacity. This is an oversight on the part of the DOE that must be corrected. The Bureau is the federal regulatory agency that has jurisdiction over water quality for the Colorado River. The Bureau is also a partner in the Upper Colorado River Endangered Fish Recovery Program and the Lower Colorado River Multi-Species Conservation Program. The Bureau has already produced publications analyzing and modeling a probable maximum flood in the Colorado River drainage and their expertise in this regard should be fully considered.

Some of the dams that the Bureau has designed have had engineering components that have become problematic. Some Bureau dams have failed entirely, such as Teton Dam. The Colorado River basin dams that have had design problems include Fontenelle, Flaming Gorge, Navajo, Glen Canyon and Hoover. The problems include seepage erosion at the earthen dams and river outlet and spillway failures at the concrete dams.

Living Rivers brought this oversight to the attention of the Bureau of Reclamation at Salt Lake City on January 27, 2005. We formally ask DOE that consultation with the Bureau is initiated and that their comments be included in the FEIS.

Response:

As an agency of the U.S. Department of Interior (DOI), the Bureau of Reclamation is represented by DOI's comments, which have been included and addressed in the EIS.
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Document #568 Comment #15 Commentor: Weisheit, John

We also remind DOE that a full consultation with the U.S. Fish and Wildlife Service (USFWS) concerning the Endangered Species Act is required for the FEIS. This would include the reasonable and prudent alternatives of USFWS's Biological Opinion.

Response:

USF&WS's Biological Opinion is included in the EIS as Appendix A3. The reasonable and prudent measures identified in the Biological Opinion would be incorporated into a mitigation action plan for DOE activities at the Moab site. Consultation between DOE and USF&WS will continue to ensure that the ground water remediation activities are working toward achieving the goals established for protection of the endangered species in the area.
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Document #568 Comment #16 Commentor: Weisheit, John

We also request consultation with the U.S. Geological Survey in the FEIS concerning this agency's recent analysis and modeling of a probable maximum flood in the Moab Valley; Report 2005−5022 became publicly available on February 11, 2005.

Response:

The conceptual cell cover and barrier wall designs include riprap materials sized to exceed the maximum river forces identified by USGS (see Section 2.1.4), and the barrier wall would be of sufficient length to mitigate against river encroachment. DOE will continue to work with the USGS to ensure that DOE is interpreting the USGS data correctly. This is one factor among many that will be evaluated when DOE selects the disposal site and method in the Record of Decision.

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Document #568 Comment #17 Commentor: Weisheit, John

We also request that the State Department should be allowed to weigh in on FEIS concerning U.S. treaty obligations with the Republic of Mexico, and because the Colorado River delta has been designated as an International Biosphere Reserve.

Response:

The analyses in the EIS demonstrate that there would be no potential for any of the disposal alternatives to measurably affect water quality in the Colorado River in Mexico; therefore, there is no reason to involve the State Department in this action.

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Document #568 Comment #18 Commentor: Weisheit, John

IV. Global warming and climate change

The DOE sponsored the Accelerated Climate Prediction Initiative (Initiative), which was administered by the Pacific Northwest National Laboratory. Much of the consequent analysis and modeling from this Initiative has been recently published and would be useful in the consideration of alternatives for the Moab Mill's tailings pile. We request the DOE consult with the principle scientists of the Initiative for the FEIS concerning the effects of climate change on the Colorado River. The report of the Initiative acknowledges that extreme variables of climate are likely to occur and due to the impacts of increasing greenhouse gases in the atmosphere. Examples of impacts from climate change would include reduced water quality as a result of diminished flows, increased sediment loads, channel narrowing of the river, and catastrophic flooding in local and regional watersheds.

Response:

Under its preferred alternative of active ground water remediation, DOE has identified a compliance goal in ground water that would be protective of aquatic species in the Colorado River. DOE has also assessed the consequences of catastrophic failure of an on-site disposal cell (Section 4.1.17), and the conceptual design of the cell includes riprap sized to withstand the erosive energy of a PMF (Section 2.1.3.1), even though such an event is highly unlikely. The climate change effects suggested by the comment could potentially result in impacts to river environments. However, no data exist to confirm or quantify these possible effects of climate warming. Attempting to superimpose the possible effects of climate warming on the disposal alternatives and analyses presented in the EIS would be too speculative for meaningful analysis.
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Document #568 Comment #19 Commentor: Weisheit, John

V. Cost analysis

Human health, national parks, endangered species and cultural heritage are priceless things. We will support the DOE to save taxpayer money so that the savings could be applied to other worthwhile service projects to protect the general health and welfare of the American people. However, because it is reasonable to assume that the On-Site Disposal Alternative may fail and that subsequent clean-up costs would be astronomical, the On-Site Alternative should be abandoned for reasons that it would potentially save taxpayer's money in the long-term. The Off-Site Disposal Alternative, though more expensive, provides greater economic and environmental security. The additional cost is therefore justified and potentially serves to be the most affordable alternative in the DEIS.

Response:

DOE acknowledges the commentor's value for human health, national parks, endangered species, and cultural heritage. Section 2.6 of the EIS acknowledges the uncertainties associated with the on-site disposal alternative. DOE will take these concerns into consideration in its final decision-making.
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Document #568 Comment #20 Commentor: Weisheit, John

VI. The river community

People depend on the Colorado River for economic security and for the enrichment of their lives through visitation at Canyonlands National Park and Glen Canyon National Recreation Area. Living Rivers, Colorado Riverkeeper, Colorado Plateau River Guides, River Runners for Wilderness and Colorado Outward Bound West represent various parts of a constituency we call the river community. The intent of this community is to partake in the organizing and participation of river trips through Canyonlands National Park and Glen Canyon NRA. The reasons include recreation, employment, education in the sciences and arts, and the monitoring of the Colorado River's environmental quality and cultural heritage.

The professional river guides represent the day-to-day users of the Colorado River. Over 300 active professional river guides have hundreds of multiple-day river trips and thousands of one-day trips that have spanned a career, for some, as long as 40 years. Their clients (numbering in the thousands annually) include the general public, special populations, and educational and cultural institutions. Another large constituency of the Colorado River users that are represented by the thousands are the non-commercial river runners who come to enjoy the benefits of Canyonlands National Park for the same reasons as stated above, which includes employment through incidental support services.

The On-Site Disposal Alternative must be abandoned for the reasons that this river community would suffer economic and social hardships should the Moab Mill's tailings pile fail in a probable maximum flood with the eventual outcome of irradiating the river corridor of Canyonlands National Park and Glen Canyon NRA. This could also affect the river community of Grand Canyon National Park and Lake Mead NRA.

Response:

The catastrophic failure analyses (Section 4.1.17) were done as a screening tool to inform decision-makers of the possible differences among the on-site and off-site disposal alternatives, even though DOE believes that there are no plausible mechanisms for such a failure. Some impacts to riparian and animal life would occur. River guides would be exposed to lower concentrations than assumed for the camping scenario even though the length of exposure is greater. The camping scenario reflects the risks associated with contaminated soils and surface water that would exist immediately adjacent to the tailings pile on the bank of the Colorado River shortly after cell failure. Two days of exposure were used because it is unlikely that any one camper would repeatedly camp at a location adjacent to the tailings pile after a failure when there are numerous, more favorable camping areas elsewhere. More favorable camping areas located downstream (including those sites that are closer to the Moab site) would have lower contaminant concentrations, thus mitigating the impact of increased usage.

DOE agrees that there is, and would likely continue to be, substantial recreational use downstream of the Moab site. However, when estimating risk, the additional use does not compensate for the significant decrease in contaminant concentrations in these downstream areas. When estimating risk, an increase in the contaminant concentration (or exposure point concentration) is directly proportional to the exposure duration. For example, the estimated dissolved uranium concentration listed in Table 4−17 for 80 percent release at the Moab site is

Document #568 Comment #20 - response continued

approximately 333 times Lake Powell concentrations. For exposure pathways involving water ingestion, the exposure duration would need to be 333 times greater (666 days per year [2 days' duration for camping times 333], which is greater than the 365 days per year that are available) at Lake Powell compared to the Moab site to account for this difference in exposure point concentrations. Concentrations would begin to drop immediately downstream of the site, so this same type of effect (to a lesser degree) would also occur for camping sites closer to the Moab site. Risks from gamma exposure from these materials compared to the risks estimated in Section 4.1.17 would be minimal, mostly because the materials would mix with, or receptors would be shielded by, water and uncontaminated sediments.
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Document #568 Comment #21 Commentor: Weisheit, John

In conclusion the risk to the downstream ecosystems and the health of millions of people is much to high to justify keeping the Moab Mill site along the shores of the Colorado River. The principle objective of the Final EIS must be the safe removal of the pile from the Colorado River, to stop the groundwater contamination of the Colorado River and the Moab Sloughs, and to contain these toxic materials at an off-site location in a responsible and efficient manner.

Response:

The EIS analyses do not support a conclusion of unacceptable risks to downstream users. However, after considering the EIS analyses, the uncertainties evaluated, other public comments, and agency comments, DOE has identified off-site disposal at Crescent Junction and active ground water remediation as its preferred alternatives. DOE will consider this comment in its final decision-making.
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Document #572 Comment #1 Commentor: Indergard, Lantz M., RG

The tailings pile is here to stay. That is the physical and fiscal reality of the present time. Floods may come just like tsunamis. We cannot control this. It's time to get over it, and fix what is fixable. We may not be able to move the pile, but we can mitigate the present source of ground water and surface water contamination. The objective of my comments is to re-focus the DOE on source area remediation, and solicit a technical response.

Response:

No decision has been made to dispose of the tailings on the site. DOE will consider all comments and the analyses in the EIS in making its decision, which will be announced in a Record of Decision to be issued at least 30 days after the final EIS is published. DOE believes the EIS is clearly focused on remediation of the Moab site and provides a level of technical detail sufficient to support DOE's decision-making.
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Document #572 Comment #2 Commentor: Indergard, Lantz M., RG

In general, the DOE needs to demonstrate more innovation with regard to the consideration, testing, and design of groundwater remediation alternatives at the site. The EIS focuses on an outdated pump & treat (P&T) alternative that largely ignores the environmental industry's modern, source area-focused, in-situ alternatives. The alternative identified in the EIS is designed to treat the symptom, and not the cause of groundwater contamination. The estimated time for cleanup (>70 yrs) corroborates this, and subtly qualifies the site for continued, long-term abuse of tax dollars.

Lack of innovation aside, a wasteful amount of characterization work has been conducted to date. This work has not been focused on the remedy. As a result, the DOE is planning to implement a long-term, expensive, and outdated technical approach.

Response:

DOE recognizes the promise as well as the constraints of innovative technologies. Section 2.3.2.1 in the EIS includes options other than pump-and-treat technologies for ground water cleanup that were prescreened. These included in situ methods. The cause of the ground water contamination was operations at the uranium mill tailings site. Because the mill is now closed, treating the cause of the contamination is no longer relevant. DOE believes that detailed site characterization work is an essential element of responsible remediation management that in the long run will save, not waste, millions of tax dollars.The commentor's recommendations are noted and will be considered during design of the long-term ground water treatment system, which will be developed in a remedial action plan after the Record of Decision.
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Document #572 Comment #3 Commentor: Indergard, Lantz M., RG

1. The DOE has experience with in-situ reductive zone (IRZ) processes, including permanent reactive barriers (PRB). However, only limited references to these processes are included in either the EIS (DOE 2004) or Site Observational Work Plan (DOE 2003). Discussion or consideration of these processes is not expanded in any of the documents. Modern IRZ processes are not limited to the robust, yet depth-limited and expensive PRB. In addition, these processes are not prone to plugging issues, such as experienced at the Monticello site. The DOE should consider modern IRZ processes, both biological and abiotic, as an alternative, or as a supplement to the planned P&T alternative.

Response:

See response to comment #2.
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Document #572 Comment #4 Commentor: Indergard, Lantz M., RG

2. The P&T alternative is forecasted to remediate groundwater in 75 years with off-site disposal and 80 years with on-site disposal. Making this statement diminishes the value of moving the pile, (particularly the political value), and further diminishes the efficacy of P&T. In addition, a 75−80 year cleanup period suddenly makes the 100-yr flood appear more threatening.

Response:

There is only a 5-year difference in the time period required for ground water remediation under the on-site and off-site remediation alternatives. Therefore, the threat of a 100-year flood is nearly equal under the on-site disposal alternative and the off-site disposal alternative. DOE disagrees that comparing the projected durations for ground water remediation diminishes the value of moving the pile.
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Document #572 Comment #5 Commentor: Indergard, Lantz M., RG

3. Oxidizing conditions in combination with microbiological activity are believed to exist beneath the tailings pile and within the aquifer in general. Under these conditions, ammonia species react to form nitrite, nitrate, or nitrogen gas (EIS 2003). This condition is corroborated by the chemically reducing conditions measured in wells located in contaminated areas. Given this condition, and the availability of modern IRZ techniques to enhance this condition, why have in-situ pilot studies not been conducted? Giving this equilibrium a little “push” may literally take decades off of the cleanup time, and will diffuse the concerns of so many stakeholders regarding pollution of the Colorado River.

Response:

Section 2.3.2.1 in the EIS includes in situ remediation, which could include some form of bioremediation, as an option for ground water cleanup. The commentor’s recommendations are noted and will be considered during design of the long-term ground water treatment system, which will be developed after the Record of Decision. Also see response to comment #2.
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Document #572 Comment #6 Commentor: Indergard, Lantz M., RG

4. The vertically stratified, saline groundwater, and hydraulically conductive aquifer provides a unique remedial opportunity. The higher salinity (more dense) groundwater pumped from the deeper aquifer should be tested as an IRZ reagent delivery mechanism. Groundwater containing 80,000 total dissolved solids (TDS) will sink vertically if injected into 20,000 TDS groundwater due to the density contrast. This is why the deep groundwater is more saline at the site. It is a density-driven equilibrium. A simple simulation of the vertical fate of 80k TDS groundwater injected into 20k TDS groundwater can be easily, and inexpensively conducted using the Sandia Waste Isolation Flow and Transport (SWIFT) model. Even at 20:1 vertical anisotropy, it will sink. Rather than worrying about groundwater “upconing”, pilot studies should be conducted to quantify the fate. The resistivity contrast between the two waters is great enough that it should be measurable using conventional cross-well tomography or a mise a la masse technique. Assuming the results of this testing demonstrates a vertical fate, pilot testing should be conducted to determine the fate of various IRZ reagents. The results should be used for IRZ remedial design, and to diffuse the “upconing” concern.

Response:

See responses to comments #2 and #5.
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Document #572 Comment #7 Commentor: Indergard, Lantz M., RG

5. The toe of the tailings pile is over 2,000 feet wide, yet the groundwater contamination is much less laterally extensive. Conventional IRZ pilot studies should be conducted in the “hot” areas. The pilot studies should include both carbohydrate-type and nano-scale zero valent iron reagents to test both the biological and abiotic response. If the results are positive, the lateral and vertical (spatial) extent of the induced reducing conditions should be investigated. The current limitation of conventional IRZ alternatives (non-PRB) is the lateral extent of effectiveness. “Lateral extent” is something which no contractor (other than GeoSierra) appears willing, or able to measure. Assuming pilot studies demonstrate that the site is appropriate for IRZ development, a laterally extensive delivery mechanism, including, but not limited to horizontal wells should be considered. This mechanism appears particularly viable with regard to the availability of saline groundwater. Dense (saline) groundwater injected horizontally into the surface aquifer will sink. Ostensibly, the result will be a vertically and laterally extensive IRZ. The challenge of this approach is in the application, not the science.

Response:

See responses to comments #2 and #5.
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Document #572 Comment #8 Commentor: Indergard, Lantz M., RG

6. The design and costs associated with the planned P&T approach should be reconsidered in light of the site-specific IRZ remedial opportunity. The evaluation should consider the potential reduction of cleanup time.

Response:

Design and costs for a pump-and-treat system were used as a comparison across all the alternatives. Section 2.3.2.1 in the EIS includes options other than pump-and-treat technologies for the long-term ground water cleanup. The commentor's recommendations are noted and will be considered during design of the long-term ground water treatment system, which will be developed after the Record of Decision.

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Document #573 Comment #1 Commentor: Fong, Leighton, P.E.—Glendale Water and Power

The City of Glendale, California, has a population of just over 200,000 and receives about 24,000 acre-feet (over 70%) of our annual water supply from the Metropolitan Water District of Southern California. The threat of the Moab uranium mill tailings to the quality of our water supply from the Colorado River is of considerable concern to our City.

Response:

The analyses in the EIS demonstrate that even under current, unremediated conditions, the effects of site contamination are localized (Section 3.1.7.3). The preferred alternatives include active ground water remediation, which would further reduce even these localized effects to below applicable surface water standards. Even under a highly unlikely catastrophic failure, discharge of 80 percent of the pile into the Colorado River would not extend impacts beyond a few miles downstream of the site (Section 4.1.17).
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Document #573 Comment #2 Commentor: Fong, Leighton, P.E.

Glendale suffered greatly when our groundwater was lost due to VOC contamination. It took almost two decades and significant expense to restore that water supply with the construction of the Glendale Operable Unit. Considerable resources will continue to be expended in the operation of treatment facilities for decades to come. We have learned the hard way that Ben Franklin knew water quality when he said an ounce of prevention is worth a pound of cure.

Response:

Past mill operations at the Moab site introduced significant quantities of contaminants into the ground water beneath the site. Active remediation of this contamination until compliance goals are met (projected to be 75 to 80 years) is one objective of DOE's proposed alternatives in the EIS. Also see response to comment #1.
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Document #573 Comment #3 Commentor: Fong, Leighton, P.E.

We can appreciate that moving the tailings will be a difficult task. However is would not compare to the efforts of remedial treatment if our water supply became contaminated from these tailings.

Response:

Comment noted.
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Document #574 Comment #1 Commentor: U.S. Environmental Protection Agency

EPA's environmental ratings: Because DOE has not selected a preferred alternative, EPA rated the potential environmental impacts and sufficiency of the information regarding the four action alternatives analyzed in the Draft EIS.

On-site Alternative	Klondike Flats Alternative Site	Crescent Junction Alternative Site	White Mesa Mill Alternative Site	No Action Alternative
EU-2	EC-2	EC-2	EO-2	not rated

Response:

DOE has considered the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS. Based on these considerations, in the final EIS DOE identifies off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. Further discussion of the basis for DOE's identification of these preferred alternatives is provided in Section 1.4. In addition, further discussion of EPA's ratings and the sufficiency of the information contained in the EIS is provided in subsequent comments and responses. DOE believes that the final NRC disposal cell design that would be developed in the post-Record of Decision remedial action plan would resolve EPA's concerns that resulted in the EC-2 rating for the Crescent Junction disposal alternative, should that location be selected in the Record of Decision.

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Document #574 Comment #2 Commentor: U.S. Environmental Protection Agency

EU (Environmentally Unsatisfactory) The basis for our Environmental Unsatisfactory rating for the On-site Alternative is the potential for prolonged environmental and public health risk that could result from the continued release of toxic contaminants to ground and surface waters because of potential failure of the proposed remedy. The on-site remedy does not include a liner beneath the disposal pile, thus allowing river flooding to continually reintroduce contaminants in to the river. Under such circumstances, the on-site remedy would not satisfy the requirements of 40 CFR 192 and the groundwater protection mandates of the State of Utah. In addition, the river could migrate towards the pile, and the salt-bed underlying the pile could dissolve, over the life of the remedy. Such natural actions would greatly compromise the integrity of the remedy.

Response:

The EIS acknowledges that episodic flooding would periodically introduce contaminants into the river (Section 4.1.3). The on-site alternative does not include installing a liner beneath the disposal pile. Nonetheless, the Department's evaluation indicates, and Section 4.1.3 has been revised to clarify, that during and after the estimated 80-year active remediation effort, even during episodic flood events, water quality would remain protective of aquatic organisms at the point of exposure. Therefore, the on-site remedy could satisfy the requirements of 40 CFR 192. The potential for the Colorado River to migrate is discussed in Section 4.1.17 and Section 2.6. Consequently, for the on-site alternative, the EIS incorporates engineered barriers in the form of tailings cover, side slope riprap, and a buried riprap barrier wall to enhance pile stability and reduce the already low probability of catastrophic failure of the dispoal cell should river migration begin to occur unexpectedly. The issue of salt bed dissolution and basin settlement is discussed in Section 4.1.1, which acknowledges that the subsidence would result in the tailings coming into permanent contact with the ground water after several thousand years.

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Document #574 Comment #3 Commentor: U.S. Environmental Protection Agency

EO (Environmental Objections) The basis for our environmental objection for the White Mesa Mill site is that DOE's conceptual plan for tailings disposal will likely be inconsistent with Utah's ground water protection standards. This concern could be corrected by project modifications.

Response:

The design considered in the EIS (Section 2.2.5) presents a reasonable configuration and conceptual design for analytical purposes against which impacts among the alternatives may be assessed. The details regarding final design of this alternative, should it be selected, would be determined through negotiations between the licensee (IUC) and the State of Utah, which is the regulatory authority under Title II of UMTRCA), as an Agreement State. The final design would meet all applicable requirements, including the criteria set forth in 40 CFR 192, and would be protective of public health and safety and the environment.

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Document #574 Comment #4 Commentor: U.S. Environmental Protection Agency

EC (Environmental Concerns) EPA has identified environmental impacts that should be avoided for the Klondike Flats Site and the Crescent Junction Site in order to fully protect the environment. Corrective measures may require additional mitigation measures that can reduce the environmental impact.

Response:

In other comments, EPA expressed specific concerns that DOE considers to be the basis for the EC-2 rating (Environmental Concerns – Insufficient Information) for the Klondike Flats and Crescent Junction disposal alternatives. As described in the EIS, DOE would mitigate these and other potential concerns in implementing either alternative. For example, EPA expressed concerns about dewatering the tailings for slurry transport, increased cover infiltration due to cracking, and ephemeral streams at Crescent Junction. Processing the tailings for off-site disposal using slurry transportation is discussed in Section 2.2.4.3. The process would use vacuum filtration to produce filter cake with a 15- to 20-percent moisture content, which is suitable for placement in the disposal cell without concern for transient drainage or substantial differential settlement that could compromise cover integrity. Construction specifications regarding moisture contents and appropriate construction management QA oversight would ensure appropriate placement of tailings should the vacuum filtration prove problematic. In the EIS, DOE proposes, conceptually, a moisture storage with capillary break, vegetated repository cover for the on-site alternative, the Crescent Junction alternative, and the Klondike Flats alternative. However, due to the high degree of geologic isolation afforded by the Crescent Junction and Klondike Flats sites, the cover performance requirements for these two alternatives may be less stringent than for the on-site alternative. DOE intends to examine a range of detailed cover designs, including moisture storage covers, for the preferred alternative. The cover design will be addressed in detail in the post-Record of Decision remedial action plan.

The EIS acknowledges that the Crescent Junction site has ephemeral streams that are ungauged and that the impacts of extreme flooding are unknown (Section 3.3.6). However, locating the disposal cell away from ephemeral drainages and implementing drainage control structures(identified in Figure 2−16) and other surface drainage control measures would mitigate this potential impact and environmental concern.

In discussions with the EPA regarding EPA’s ratings for the Klondike Flats and Crescent Junction alternatives, DOE clarified that the level of detail regarding cover design and performance that formed the principal basis of EPA’s EC-2 ratings are not addressed under UMTRCA until after the Record of Decision in the remedial action plan, and that the fundamental cover design elements mentioned in its comments are in fact included in the conceptual design used in the EIS. With this explanation, EPA informally agreed that its rating for Klondike Flats and Crescent Junction should perhaps have been Lack of Objection (LO).
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Document #574 Comment #5 Commentor: U.S. Environmental Protection Agency

Category 2 (Insufficient Information) EPA finds that the draft EIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment. The identified additional information, data, analyses, or discussion should be included in the Final EIS.

On-site Alternative: The Moab site lies adjacent to the Colorado River, the principal surface water resource for the area, which has been classified by the State of Utah as protected for warm-water game fish and other aquatic life. The River continues to be adversely affected by site-related contamination, mostly because of groundwater discharge. Contaminants from the tailings pile include uranium and ammonia, which during low river flow conditions exceed water quality standards. For example, ammonia concentrations in the River in the vicinity of the tailings pile exceed 300 mg/L, resulting in conditions that are, at times, toxic to native and endangered fish. The on-site remedy would result in continuing exceedances of water quality criteria over the long term. Indeed, the DOE estimates that after remediation and ground water clean-up, ammonia will remain in toxic concentrations to aquatic life for 80 years.

Response:

The commentor has accurately summarized certain key aspects of current conditions at the Moab site as described in the EIS. Results of DOE’s contaminant transport and ground water flow computer modeling indicate it would take approximately 75 years for the ground water to passively clean itself to levels that would be protective of aquatic organisms in the adjacent surface waters if the pile were relocated. If the pile were stabilized in place, it would take 5 years longer (or approximately 80 years) to reach the same level of protection. However, DOE disagrees with the commentor’s interpretation that the on-site remedy would “result in continuing exceedances of water quality criteria over the long term.” As described in Section 2.3 of the EIS, the Department would perform an active ground water remedial action to maintain protective levels in the river during the 75- to 80-year period required for the aquifer to passively clean itself. Once implemented (within 5 to 10 years of the Record of Decision), this remedial action would intercept contaminated ground water, prevent its reaching the river, and thereby maintain protective surface water quality in the river. In Table 2−33 (item #1), the EIS acknowledges the assumptions and uncertainties of the ground water and site conceptual models and articulates the potential consequences of those uncertainties, including the possibility that the target goal of 3 mg/L ammonia in ground water might never be met and that ground water remediation would be required indefinitely beyond the projected 75- to 80year ground water remediation periods for off-site and on-site disposal, respectively. The impacts to aquatic organisms from both on-site and off-site disposal are discussed in Chapter 4.0 of the EIS and in the Biological Assessment (Appendix A1 of the EIS). The USF&WS Biological Opinion (Appendix A3 of the EIS), which was not available for the draft EIS, concurs with DOE’s determinations for threatened and endangered species as set forth in the Biological Assessment. On the basis of DOE’s preferred alternatives (relocation of tailings to Crescent Junction by rail and ground water remediation at the Moab site), the USF&WS would allow a take of endangered fish for up to 10 years. As conditions of the take provision, the USF&WS is requiring DOE to comply with Reasonable and Prudent Measures and Conservation Measures to ensure that DOE is minimizing the potential take of endangered fish. These measures, which include a water quality monitoring plan, are detailed in the Biological Opinion.

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Document #574 Comment #6 Commentor: U.S. Environmental Protection Agency

Presently, river flooding periodically saturates the toe of the pile and continually reintroduces contaminants into the ground water and the river. Moreover, although the draft EIS presents information that supports the notion that river migration may be away from the pile to the south and east, DOE also accepts that the direction of river migration remains uncertain in the long term. Consequently, it is very unlikely that the proposed on-site remedy will be able to provide sufficient long-term pile stability due to the potential for the Colorado River to migrate north and west towards the pile.

Response:

The EIS acknowledges the potential for episodic flooding of the tailings pile if it were capped in place and quantifies the impacts that could result from such inundation (Section 4.1.3). These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in the EIS, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. It is DOE's opinion that these measures would make the probability of a catastrophic failure of an on-site disposal cell very low. Recent USGS data on potential flood velocities that might occur at the pile would be utilized for the final design of the riprap side slopes and the barrier wall if the on-site disposal alternative were selected.
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Document #574 Comment #7 Commentor: U.S. Environmental Protection Agency

Additionally, the eventual dissolution of the salt-beds underlying the disposal site will result in prolonged saturation of the toe of the pile. Moreover, the dissolution of the salt-beds will result in subsidence in the vicinity of the disposal site, which will compromise the integrity of the cap, which would lead to radon release and increased rate of water infiltration through the pile.

Response:

The Department agrees with the EPA that at some point far in the future, dissolution of the underlying salt beds will result in prolonged saturation of the toe of the pile as described in the EIS (Sections 3.1.1.4 and 4.1.1) if the pile were not relocated. The regulatory time period for the design of the cell is at least 200 years but not to exceed 1,000 years (40 CFR 192). Under the analytical assumptions in the EIS, dissolution of the salt beds and subsidence in the vicinity of the disposal site is on a geologic time frame that is well beyond the regulatory design period.
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Document #574 Comment #8 Commentor: U.S. Environmental Protection Agency

Based on the above, the on-site alternative, in the long-term will not be able to satisfy the requirements of 40 CFR 192 or the State of Utah's groundwater protection requirements. Consequently, EPA strongly recommends that this alternative be eliminated from consideration because it cannot meet the established purpose and need for the project.

Response:

DOE acknowledges that uncertainties necessarily surround its assumptions regarding the cover performance, ground water modeling, and several other factors discussed in Section 2.6.3. However, despite these uncertainties, DOE believes the on-site disposal alternative is nonetheless a reasonable alternative and, therefore, must be considered in the EIS pursuant to NEPA. In addition, DOE's position is that including the on-site alternative in the EIS is necessary in order to present all the environmental information required to support sound decision-making. In making its final decision, DOE will consider EPA's views regarding the on-site alternative. Also see response to comment #1.

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Document #574 Comment #9 Commentor: U.S. Environmental Protection Agency

Klondike Flats Site: This remedy would require relocating the Moab tailings 18 miles north to land managed by the Bureau of Land Management (BLM). Klondike Flats is remote and there are no perennial streams or other surface water features in or near this area; therefore, there are no significant aquatic ecological resources or wetlands that would be affected. Truck or rail transport to this site would not require the transport of tailings through a community. The Klondike Flats location has suitable depth to groundwater protected by the impermeable Mancos Shale. Constructing the optional slurry line to transport the Moab tailings would reduce the highway safety concerns, but does not eliminate them, because a substantial portion of the tailings may prove to be unsuitable for slurry transport. This could require significantly more truck transport for the slurry line not considered by DOE. Transport by slurry requires dewatering the material upon arrival at the site to achieve optimal moisture content. This is a concern because if dewatering fails to achieve optimal moisture, there is a risk of increasing leachate volumes and extending the transient leaching time through the disposal cell. It should be noted that rail transport has the lowest accident rate potential. The site has some environmental concerns due to conflicts with recreational vehicles and will require transporting cover material from another location on BLM lands. Because the conceptual cover as designed may result in rain water infiltration due to clay desiccation, selecting a cover design based on a soil-water balance will further reduce infiltration.

Response:

The comment accurately summarizes certain aspects of the Klondike Flats site as described in the EIS. The EIS acknowledges in Section 2.2.4 that some truck traffic would be necessary under the slurry line option because some debris and large material could not be processed for slurry transport. The potential for conflicts between recreational vehicle operators using the area near the Klondike Flats site and tailings truck traffic is acknowledged in the EIS (Section 4.2.8.2); this discussion has been expanded in the final EIS. In addition, the uncertainty and potential for significantly more truck transport for the slurry line alternative is discussed in Section 2.6.

The commentor's concerns regarding transport by slurry and associated dewatering of the material upon arrival at the site to achieve optimal moisture content are addressed in Section 2.2.4. Also see response to comment #4.

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Document #574 Comment #10 Commentor: U.S. Environmental Protection Agency

Crescent Junction Site: This remedy would relocate the Moab tailings 30 miles north to land managed by BLM. The site covers several square miles of desert terrain and no perennial streams are present. However, ephemeral streams may carry high flow during heavy rains. Because no perennial steams or other surface water bodies are present, aquatic ecological resources and wetlands would not be adversely affected by activities at this site. The Crescent Junction location has suitable depth to groundwater protected by the impermeable Mancos Shale. Truck transport and slurry transport have similar environmental concerns to those we identified for the Klondike site. Rail transport requires a longer haul than the Klondike site, but this does not increase cost significantly since the expense of rail haul is primarily associated with loading and unloading material. Rail transport to Crescent Junction can use the existing separate grade crossings. This site has an environmental advantage compared to other sites, because suitable cover material can be obtained at the proposed cell location resulting in less land disturbance. As noted above for the Klondike Flats site, DOE's proposed disposal cell cover may allow leachate movement; therefore EPA suggests selecting a cover design based on a soil-water balance that will further reduce infiltration.

Response:

The commentor's synopsis of the Crescent Junction site conditions and logistics is consistent with the information presented in the EIS. As noted in the response to comment #1, in the final EIS DOE identifies off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.

The response to the commentor's concerns regarding truck and slurry transport and cover design is identical to the response for comment #9, except to note that potential conflicts between recreational vehicles and tailings trucks would be much less likely under the Crescent Junction alternative due to its location. Also, see response to comment #4.
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Document #574 Comment #11 Commentor: U.S. Environmental Protection Agency

White Mesa Mill Site: This remedy would co-locate the Moab tailings 85 miles south to privately-owned lands at the uranium mill managed by the International Uranium (USA) Corporation (IUC). Other than the tailings disposal ponds, no perennial surface water is present at this site. Wetlands at the site are restricted to very small areas. In addition, there is also a concern with the adequacy of ground water protection from disposal of uranium mill wastes at this site. IUC is in the process of installing a double cell liner in order to meet Utah's Ground Water Protection Program requirements. Changes to the design of the proposed disposal cells are needed to adequately protect ground water in the Burro Canyon formation, which is the uppermost aquifer. DOE acknowledges that this could potentially contaminate surface springs within several thousand years. Such contaminantes could contain uranium, other radioactive constituents, and mill-sourced pollutants. This site may require significant improvements to the proposed waste cell design in order to assure compliance with the ground water protection requirements for the State of Utah.

Transportation concerns and long-term risks to ground water of this remedy, as proposed and designed, could be significant unless additional design measures are implemented. Truck transport along narrow US-191 presents a high risk of vehicular accidents and would significantly increase noise in the communities of Moab, Monticello, and Blanding. Slurry transport has similar environmental concerns to those we identified for the Klondike site and would also disrupt wetlands by crossing the Scott Matheson wetlands preserve and impact numerous Anasazi-culture or older archeological sites.

DOE also needs to consider that locating these tailings at the White Mesa Mill site adversely affects ten or more Native American traditional cultural properties. The Ute Mountain Ute Tribe, which represents the White Mesa community four miles south of the mill, does not support selection of the White Mesa Mill site, due in part, to the predicted impact to these traditional cultural properties.

Response:

The design considered in the EIS (Section 2.2.5) presents a reasonable configuration and conceptual design for analytical purposes against which impacts may be comparatively assessed. The details regarding final design of this alternative, should it be selected, would be determined through negotiations between the licensee (IUC) and the State of Utah, which is the regulatory authority under Title II of UMTRCA, as an Agreement State. The final design would meet all applicable criteria, including the criteria set forth in 40 CFR 192, and would be fully protective of public health and safety and the environment.

As the commentor points out, the EIS acknowledges that under the conceptual design, contaminants could potentially impact surface springs within several thousand years (Section 4.4.3), which is well beyond the requisite period of compliance (200 to 1,000 years).

The EIS acknowledges the noise and traffic impacts associated with the truck and slurry transportation modes in Sections 4.4.10 and 4.4.16, respectively. Although truck transportation risks are greater than rail risks, DOE does not agree that the risk of vehicular accidents would be "high." Nevertheless, DOE agrees that it would be prudent to minimize the potential risks for all

Document #574 Comment #11 - response continued

transportation options. Slurry transport impacts on wetlands are identified in Sections 4.4.5, and the impacts associated with cultural resources are addressed in Section 4.4.9.

DOE is sensitive to the concerns of the Ute Mountain Ute Tribe regarding potential impacts to traditional cultural properties. These concerns will be considered as input to DOE's final decision.
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Document #574 Comment #12 Commentor: U.S. Environmental Protection Agency

No Action Alternative: Under the No Action Alternative, no contaminated materials would be remediated or removed from the Moab site. EPA is not rating the No Action Alternative, because the Agency does not believe this is a feasible alternative considering the stated purpose and need and applicable environmental laws and regulations. If DOE identifies the No Action Alternative as a preferred alternative, EPA will fully analyze and rate the alternative at that time.

Response:

The No Action alternative provides a necessary baseline for comparing the impacts of the action alternatives. The EIS acknowledges that selection of the No Action alternative would be highly unlikely because it would entail cessation of management of the site in violation of the requirements of 40 CFR 192.
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Document #574 Comment #13 Commentor: U.S. Environmental Protection Agency

Thank you for the opportunity to review and comment on DOE's alternatives to remediate the Moab uranium mill tailings pile, one of a few remaining uranium mill tailings piles located within a river floodplain. In conclusion, we suggest DOE fully consider the benefits of either the Klondike Flats site or the Crescent Junction site using rail transport in order to provide a secure geologic setting that offers the best opportunity for long-term public health and environmental protection.

Response:

As noted in the response to comment #1, in the final EIS DOE identifies off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE will consider EPA's suggestions in its final decision-making.
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Document #574 Comment #14 Commentor: U.S. Environmental Protection Agency

Based on the rating for the On-site Alternative, we may refer this matter to the President's Council on Environmental Quality unless a satisfactory agreement can be reached. We would like to formally consult with DOE regarding the two alternatives that EPA rated as "Environmentally Unsatisfactory" and "Environmental Objections." Please contact me at ……… to begin our consultation process. Your staff may wish to contact Weston Wilson at extension 6562 regarding NEPA procedures, Robert Duraski at extension 6728 regarding 40 CFR 192 and the NESHAPS standards, Paul Mushovic at extension 6662 regarding remediation engineering and material transport, and Helen Dawson at extension 7841 regarding ground water clean-up.

Response:

DOE has consulted with EPA's Weston Wilson regarding the ratings for Klondike Flats and Crescent Junction alternatives. DOE and EPA informally agreed that the level of detail requested by EPA is not developed under UMTRCA until after the Record of Decision in the remedial action plan and that sufficient information is available in the EIS for decision-making. The on-site alternative and the White Mesa Mill alternative were not identified as the preferred surface remediation alternative based on the analyses in the EIS, the uncertainties regarding these alternatives, and comments on the draft EIS, including these EPA ratings. As appropriate, for subjects such as 40 CFR 192, National Emissions Standards for Hazardous Air Pollutants (NESHAPs), remediation engineering and material transportation, and ground water clean-up, DOE would contact EPA staff as needed during the development of the remedial action plan.
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Document #574 Comment #15 Commentor: U.S. Environmental Protection Agency

A. Description of the Proposed Action: DOE has been given responsibility for the now-abandoned Moab uranium mill tailings site near Moab, Utah. These tailings consist of approximately 12 million tons of previously milled uranium ores which contain radioactive materials that exceed concentrations limits set to protect human health as established in 40 CFR 192. DOE intends to take action to remediate the Moab site in accordance with UMTRCA Title 1. DOE is proposing to: 1) remediate these approximately12 million tons of contaminated material, 2) remediate about 40,000 tons of contaminated material located in Moab, known as 'vicinity properties' consisting primarily of residential and commercial buildings in the Spanish Valley, and 3) to develop a ground water remedy to clean up the contaminated ground waters underlying the tailings site. The alternatives analyzed in detail include either on-site or off-site locations to place these contaminated materials in a secure location. DOE needs to demonstrate for these remedies that the disposal cell cover and liner, institutional controls, and custodial care as required under UMTRCA, would be capable of providing long-term protection for at least 200 years or longer

Response:

DOE agrees that its selected remedy must be capable of providing long-term protection for at least 200 years or longer, as required under UMTRCA. As has been accomplished at numerous other remediated UMTRCA sites over the last 20+ years, DOE would develop a final disposal cell design for the selected surface remediation alternative that would be approved by NRC and that would meet or exceed the regulatory performance requirements.

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Document #574 Comment #16 Commentor: U.S. Environmental Protection Agency

B. Environmental and human health risks if no action is taken: The information provided by DOE, the National Academy of Sciences, and others demonstrated that a remedy must be capable of providing reliable long-term protection for people and the environment. If the tailings pile were left in place without remediation, the pile could emit radon gas, causing human health risks on-site.

Response:

DOE agrees with the comment. Leaving the pile in place without remediation is the No Action alternative analyzed in the EIS. The impacts of the No Action alternative from releases of radon from the pile are discussed in Section 4.6.15. These impacts include impacts from radon releases both to individuals located off the site and to individuals located on the site who might intrude into the pile.

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Document #574 Comment #17 Commentor: U.S. Environmental Protection Agency

For stream water quality, the primary contaminant of concern at the tailings pile includes uranium and ammonia. Uranium concentrations above 5 mg/L can occur in the river near Moab Wash which is about one hundred times the EPA-established requirement for uranium in drinking water of 0.044 mg/L (30 pCi/L). Ammonia currently exceeds 1000 milligrams per liter (mg/L) in ground water and at times exceeds 300 mg/L in river backwater areas which is toxic at times to native and endangered fish. These concentrations exceed by a factor of 100 the aquatic toxicity criteria for ammonia, which is 3.0 mg/L based on the hardness, temperature and alkaline pH of the Colorado River. The pile without remediation is likely to leach ammonia in toxic concentrations to aquatic life for centuries or even up to 1500 years.

Response:

DOE agrees that the No Action alternative would not be protective of surface water. Under the No Action alternative, exceedances of the applicable compliance criteria would occur over long time periods.
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Document #574 Comment #18 Commentor: U.S. Environmental Protection Agency

C. Comments of the application of certain regulatory requirements. In 1982, EPA produced the Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites to support the standards in 40 CFR 192 (EPA 520/4-82-013-1). This Final EIS document will be referred to as the 40 CFR 192 EIS. DOE, the Nuclear Regulatory Commission, and other federal agencies reviewed and commented on the Draft of the 1982 EIS. In many cases, statements and risks as presented in the Moab EIS differ significantly from the 40 CFR 192 EIS regarding application of the 40 CFR 192 standards. We suggest that the DOE's Final EIS for Remediation on the Moab Uranium Mill adopt the same procedures and conclusions used to calculate human cancer risks as presented in EPA's 40 CFR 192 EIS.

Response:

The methods and data used to estimate impacts in the two EISs are generally consistent. However, as required under NEPA, in some instances the Moab EIS used more current data for estimating human health and other impacts than were available in 1982 for the Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192).
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Document #574 Comment #19 Commentor: U.S. Environmental Protection Agency

Section 112 of the Clean Air Act is the legislative authority used by EPA to establish the National Emissions Standards for Hazardous Air Pollutants (NESHAPS). The Draft EIS indicates that NESHAPS requirements for radon flux do not apply during active remediation. NESHAPS requirements under 40 CFR 61 Subpart Q does not apply after final disposal or during periods of active remediation for Title II sites. However, Subpart T of the NESHAPS requirements is applicable two years after a Title I uranium mill site has become inactive (See 40 CFR 61.220 and 61.222 (b)). The Moab Uranium Mill tailings pile has been inactive and under DOE's authority for longer than two years. The Subpart T rule states that such tailings piles are required to meet the 20 pCi/m_2-s Radon (Rn-222) flux standard unless a compliance agreement is reached because it is not physically possible for the owner or operator to complete disposal within the two-year time frame. DOE's selection and implementation of its remedy to be defined in the Final EIS and the eventual ROD would likely satisfy the latter condition. It should also be noted the DOE is in compliance with Order 5400.5 as described in the Moab Annual Site Environmental Report (DOE-EM/GJ677-2004).

Response:

DOE concurs with the commentor that 40 CFR 61 Subpart Q does not apply to the Moab tailings. Because the Moab tailings are regulated under Title I of UMTRCA, Section 7.1.11 has been revised to state that the requirements of 40 CFR 61 Subpart T would apply to the final disposal site after long-term stabilization of the final disposal site had been completed as described at 40 CFR 61.223(e). Furthermore, DOE acknowledges the commentor's characterization of the 40 CFR 61, Subpart Q and Subpart T regulations, and agrees that the final EIS and eventual Record of Decision satisfy both EPA and DOE requirements with respect to compliance with 40 CFR 61, Subpart T regulations.
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Document #574 Comment #20 Commentor: U.S. Environmental Protection Agency

The calculation of radon daughter concentrations above the pile may not be consistent with 40 CFR 192 methods. The radon concentration above the pile is listed as being at 0.096 working level (WL) which corresponds approximately to 21 pCi/L of radon gas. Were both of these numbers the result of samples, or was an Equilibrium Ratio (ER) assumed? If an ER was assumed, it may not be valid. An ER of 0.45 above a tailings pile appears to be large since the samples were collected at a location where the radon decay daughters would have been removed when air migrates out of the tailings. Stripping of the radon daughter products should result in a lower ER as described in the 40 CFR 192 EIS. See page 46 of that EIS regarding in growth of radon decay products.

Response:

The radon concentration of 0.096 working level (WL) was measured using the modified Kusnetz method, which is one of the methods in NRC Regulatory Guide 8.30, Health Physics Surveys in Uranium Recovery Facilities, that is suitable for measuring radon progeny WLs. The method consists of sampling radon progeny on a high-efficiency filter paper for 5 minutes and, after a delay of 40 to 90 minutes, measuring the alpha counts on the filter during a 1minute interval. No assumption about the equilibrium ratio is made with this method. In addition, the radiation risks in the EIS are based on the measured WL value, not on the calculated value of 21 picocuries per liter (pCi/L), which was provided for illustrative purposes. For perspective, outdoor equilibrium ratios typically range from 0.3 to 0.8.
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Document #574 Comment #21 Commentor: U.S. Environmental Protection Agency

Department of Transportation (DOT) Transport Exemption. On January 26, 2004, the DOT changed the hazardous materials transportation rules as described at 49 CFR 171, 172 et al. Compliance with this new rule may mean that the Moab uranium mill tailings will have to be transported as Class 7 material. If the current exemption for these mill tailings from Class 7 material transport rules is no longer valid, this would increase the cost and time, due to the limited availability of Class 7 shipping containers. DOE should verify whether the current DOT hazardous waste transport exemption is still in effect under this new rule and state this in the Final EIS and recalculate costs and schedules accordingly.

Response:

For materials that require truck or rail transport, DOE is currently determining compliance requirements under the new rule. The previous exemption granted by DOT has expired, and DOE would apply for a new one specifically for the Moab site, depending on the alternative selected in the Record of Decision. Based on prior experience, DOE believes that DOT will grant a new exemption. However, DOE cannot exclude the possibility that an exemption would de denied and that the new Class 7 truck and rail-shipping requirements would be applicable for the Moab tailings and vicinity properties, which could add to current cost and schedule estimates. The applicable permits and exemptions are discussed in Section 2.2.4.1 of the EIS.
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Document #574 Comment #22 Commentor: U.S. Environmental Protection Agency

D. Comments on the Alternatives

1) Cap-in-Place On-site Because the tailings pile may continue to serve as a source of contamination for several hundred years, it will be difficult to achieve the remediation target goal in 80 years. The uncertainty of length of time needed for completion of the ground water clean-up remedy on-site should be clearly stated as part of DOE's upcoming decision to select a preferred alternative.

Response:

See responses to comments #1 and #5.
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Document #574 Comment #23 Commentor: U.S. Environmental Protection Agency

The key assumption used to estimate drainage from the tailings pile is that the infiltration rate after construction of the cap will be 1×10^{-8} centimeters per second (cm/s.) Other similarly constructed caps have shown that this low infiltration rate is difficult to engineer and maintain and therefore is likely to be higher. If the rate of infiltration through the cap is a magnitude greater, at 1×10^{-7} cm/s, drainage from the tailings pile will be an order of magnitude greater, significantly affecting the estimates of the impacts of the tailings pile on ground water contaminant concentrations. The result will be much higher concentrations in ground water, which may adversely impact surface water after the projected 80-year operation period for the ground water remediation system. The Draft EIS indicates that the infiltration rate through the tailings will decrease from the current conditions to 10^{-8} cm/s following construction of a cover. This would suggest that the gravity drainage would decrease from an estimated 8 gpm to 0.8 gpm with resulting transient drainage decreasing from the present estimate of 12 gpm to having no transient drainage within 20 years. Constructing a cover on the site meeting these hydraulic conductivities is problematic based on monitoring of other similar covers over time.

Response:

The commentor is correct that if the rate of infiltration through the cap is greater than 1×10^{-8} cm/s, then higher ground water concentrations would result. If the rate of infiltration through the cap is a magnitude greater, at 1×10^{-7} cm/s, the ground water concentrations would be the same as the No Action alternative. Under the No Action alternative, the proposed ground water concentration goal of 3 mg/L ammonia cannot be achieved. The No Action disposal alternative cover with a saturated hydraulic conductivity of 1×10^{-7} cm/s indicates that a maximum ground water concentration of approximately 6 mg/L ammonia would be achieved after 75 years. This concentration is twice as high as the ground water goal of 3 mg/L ammonia achievable for a 1×10^{-8} cm/s cover. Details of the No Action alternative cover are provided in Section 6 of the SOWP.

DOE agrees with the comment that a 1×10^{-8} cm/s cover may be difficult to construct. This uncertainty of the analytical modeling, which includes cover performance assumptions, and the effects on ground water remediation are discussed further in Tables S−1 and 2−33, item #1.

Document #574 Comment #23 - response continued

However, based on technical literature (Howell and Shackelford 1997; Estronell and Daniel 1992) and experience with other cover designs (Albright et al. 2004), the Department has a reasonable assurance that a cover can be successfully constructed with saturated hydraulic conductivity values that meet the ground water protection strategy requirements (1×10^{-8} cm/s). Further, it is explicitly contemplated in UMTRCA that long-term stewardship, including monitoring and maintenance of the institutional and engineering controls, would be applied to the site to ensure long-term performance and protection of public health and the environment.

Additionally, in the draft EIS, DOE proposed conceptually a moisture storage with capillary break, vegetated repository cover for the on-site disposal alternative and for the Crescent Junction and Klondike Flats off-site disposal alternatives. However, due to the high degree of geologic isolation afforded by the Klondike Flats and Crescent Junction sites, DOE believes the cover performance requirements for these sites may be less stringent than those for the on-site disposal alternative. After the Record of Decision, DOE intends to examine a range of cover designs, including moisture storage covers, for the selected alternative. The cover design details will be addressed in the remedial action plan.
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Document #574 Comment #24 Commentor: U.S. Environmental Protection Agency

Long-term risks to maintaining pile stability without remediation are due to the well-established risk of river flooding. Four flood events since the 1880s had a river stage high enough to inundate a portion of the tailings pile. As noted in our cover letter, river flooding is a significant long-term management problem that is compounded by unstable geologic conditions associated with possible river migration and dissolution of the underlying salt beds. EPA concludes that selection of an off-site remedy, which would avoid these geologic uncertainties, is needed in order to secure that DOE's long-term protection goals be achieved.

A very large flow event in Moab Wash may compromise long-term pile integrity. A probable maximum flood (PMF) in Moab Wash could occur during the summer rather than late spring snow-melt affected conditions which are more typical of Colorado River flooding conditions. We suggest the Final EIS provide more information than that provided which indicates that such flood flow velocities would be quite low over the Moab Wash bank. In the event of a such a catastrophic storm event in the Moab drainage basin, flows in Moab Wash could cause a re-routing of this stream channel and may undermine and potentially remove a portion of the engineered pile. Tailings and debris from the flood would be deposited on river banks and along sandbars immediately down-gradient from the confluence of Moab Wash and the Colorado River.

Response:

DOE agrees that four floods since the 1880s had a river stage high enough to inundate a portion of the tailings pile. Under the 100-year flood scenario, the river level would be approximately 4 feet above the toe of the pile, as occurred during the 1984 flood. During this flood, the unprotected pile was not breached because velocities decrease when the river flows over its banks. In the EIS, DOE acknowledges the potential for the pile to be inundated during floods (Sections 4.1.1 and 4.1.3). If the on-site disposal alternative were selected, the side slopes would be protected by riprap and the toe of the pile would be protected by an engineered barrier to river migration, as described in Section 2.1.1 of the EIS. It is DOE's opinion that these measures would make the probability of a catastrophic failure of an on-site disposal cell very low. Recent USGS data on potential flood velocities that might occur at the pile would be utilized for the final design of the riprap side slopes and the barrier wall if the on-site disposal alternative were selected.

With regard to the comment about a large flow event in Moab Wash, Sections 2.1.1.1 and F2.1.2 of the EIS include the following proposed actions. The existing Moab Wash would be rechanneled to run through the former millsite area. Rechanneling would begin before completion of the disposal cell. The reconfigured channel would discharge into the river upstream near the approximate location of the pre-operations discharge point. The channel would be designed to carry runoff that has the approximate magnitude of a 200-year flood. Flood protection along the base of the pile would protect it from more significant floods.

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Document #574 Comment #25 Commentor: U.S. Environmental Protection Agency

2) Klondike Flats Alternative Site: This site does not have geologic uncertainties like that on-site. The Klondike Flats location has a depth to groundwater protected by approximately 1000 feet of the impermeable Mancos Shale. Constructing the optional slurry line to transport the Moab tailings would reduce the highway safety concerns, but does not eliminate them, because a substantial portion of the tailings may prove to be unsuitable for slurry transport. This could require significantly more truck transport for the slurry line not considered by DOE. The site has some environmental concerns due to conflicts with recreational vehicles within the same valley. Borrow materials for cover material will need to be hauled from locations on BLM lands.

Response:

See responses to comments #4 and #9.
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Document #574 Comment #26 Commentor: U.S. Environmental Protection Agency

3) Crescent Junction Alternative Site: This site also lacks the problems with future geologic uncertainties like that on-site. The Crescent Junction location also has suitable depth to groundwater protected by approximately 4000 feet of impermeable Mancos Shale. Although rail transport requires a longer haul than the Klondike site, this does not increase cost significantly, as the costs are principally related to the conveyer operational costs associated with loading and unloading material. Rail transport to Crescent Junction can use the existing separate grade crossings under US-191 and Interstate 70. This site has an environmental advantage compared to other sites because suitable cover material can be obtained at the proposed cell location resulting in less land disturbance.

Response:

The commentor's synopsis of the Crescent Junction site conditions and logistics is consistent with the information presented in the EIS. See responses to comments #4 and #10.
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Document #574 Comment #27 Commentor: U.S. Environmental Protection Agency

4) White Mesa Mill Alternative Site: The White Mesa site is overlain by wind- blown soils and there is a perched ground water table in the Burro Canyon Formation immediately underlying the site. DOE proposes waste cells to meet UMTRCA standards. EPA does not object to the application of UMTRCA requirements for geologically suitable site conditions. However, this site will require significant improvements to the proposed waste cell design in order to assure long-term compliance with the more rigorous ground water protection requirements of the State of Utah. For example, the design that is presently being employed for the reconstruction of disposal cell 4A would meet the groundwater protection regulations for the state of Utah.

Response:

See response to comment #11. In developing the cell design, DOE would utilize knowledge and experience gained from its managing 22 UMTRCA Title I cleanup projects for more than 20 years.
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Document #574 Comment #28 Commentor: U.S. Environmental Protection Agency

Transportation concerns and long-term risks to ground water of this remedy, as proposed and designed, could be significant unless additional design measures are implemented. Truck transport presents a high risk of vehicular accidents. The increase in truck traffic along US191 would be up to 1200 trucks per day resulting in almost a doubling of the truck traffic along this highway.

Response:

The potential for both truck accidents and increased traffic that would result under each alternative are quantified in the EIS, especially in Appendix H (Transportation Impact Analysis). These impacts will be considered in DOE's final decision. Although truck transportation risks are greater than rail risks, DOE does not agree that the risk of vehicular accidents would be "high." Nevertheless, DOE agrees that it would be prudent to minimize the potential risks for all transportation options.

With regard to the ground water aspect of the comment, DOE would work with cooperating federal and state agencies to ensure that the ground water component of the remedial action plan would comply with 40 CFR 192 remediation standards.
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Document #574 Comment #29 Commentor: U.S. Environmental Protection Agency

There will be a significant increase in ambient and night-time noise in the communities of Moab, Monticello, and Blanding. Since US-191 passes residential properties in Moab, residents in these homes could be exposed to noise levels above the Moab residential standard of 65 dBA. As haul trucks increase their speed south of Moab, the area that will experience ambient noise conditions greater than 65 dBA will be over 400 feet from the highway (Draft EIS at page 4−139.) Residents in Monticello and Blanding will also likely experience noise levels above this standard, even though speed limits are 30 mph within these communities. Because these communities now experience little nighttime disruptive noise conditions, this will result in a significant impact to these residents.

Response:

Section 4.4.10 describes the noise increase under the White Mesa Mill disposal alternative using trucks as the mode of transportation. The night-time impact is discussed in Section 4.4.10.5. The average noise levels and region of influence are quantified in Table 4−45.
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Document #574 Comment #30 Commentor: U.S. Environmental Protection Agency

1) Truck and Rail Transport: Alternatives to using petroleum diesel fuel – For the truck and rail transport options, DOE should investigate the environmental and equipment operational advantages of using a mixture of vegetable oil and diesel fuels known as biodiesel. Combustion of biodiesel fuels emits less carbon monoxide and offers up to a 10 to 15 percent reduction in particulates and hydrocarbon emissions compared to petroleum diesel. Using biodiesel fuels results in releasing less climate-changing CO_2 emissions based on initially capturing atmospheric carbon during oil-plant growth. Usually these fuels are produced from dry-crop farming of soy, canola or mustard seed, which do not require supplemental irrigation water. Heavy equipment run on twenty percent blend of vegetable oil and petroleum diesel, known as B20 fuel which is 20% vegetable oil and 80% petroleum diesel, has proven reliable in winter conditions with climates more severe than eastern Utah. The twenty percent blends, or lower, do not gel in severe cold. Biodiesel fuels provide engine operational advantages due to their viscosity properties which may extend engine life and reduce engine maintenance requirements. Biodiesel can also increase engine efficiency because it has a higher cetane rating than petroleum diesel. Although B20 fuel costs more than petroleum diesel fuel, a renewable energy subsidy will become effective in 2005 for blender of biodiesel fuels. This federal subsidy will provide one cent per percent of blended vegetable oil to the fuel blender companies. This means that a blender of B20 biodiesel fuels will receive a tax credit of 20 cents per gallon which could offset the cost differential so that B20 biodiesel fuel prices may then equal the cost of petroleum diesel.

Response:

If feasible, practical, and available, DOE would use environmentally preferred fuels and energy sources. While DOE agrees with the commentor's point, a balance of costs and benefits to taxpayers (and the environment) must be considered in selecting energy sources.
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Document #574 Comment #31 Commentor: U.S. Environmental Protection Agency

2) Rail Transport: DOE has indicated that as many as 2,200 trucks would be required to transport oversized and demolition debris to the off-site alternatives. The upper size-limit constraint for a conveyor belt might be several inches to a foot in diameter. Therefore, if the pile contains additional oversized material than currently estimated, this should not be a significant issue for rail transport.

Response:

DOE concurs with the comment. Based on project files and on-site experience, DOE estimates that 35,000 cubic yards (yd^3) of debris would not be transportable by rail due to size or shape constraints. This is described in Section 2.2.4.2 of the EIS. The volume size limits for material that could be placed on the conveyor belt would be developed in the remedial action plan.
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Document #574 Comment #32 Commentor: U.S. Environmental Protection Agency

3) Slurry Transport: The average particle size is critical to operating the slurry pipeline option. The upper-size constraint for the slurry pipeline will be less than .03 inches. The amount of material unsuitable to be slurried could be a significant problem with potentially tens times as much material in the pile that must be truck-hauled if the slurry line is selected. The Final EIS should also include a thorough discussion of the uncertainties associated with the process of evaporative drying of slurried tailings in order to meet optimal moisture content for placement and compaction. Once placed into a cell, even if placed at optimal moisture content, transient drainage will continue for perhaps 25 years. If the tailings were to be placed at conditions above the optimal moisture content, then transient drainage from such tailings may extend considerably longer. Because the Mancos Shale beneath the Klondike and Crescent Junction provides much greater protection to surface and ground water than does the White Mesa site, the differences in slurry transport by alternative should be defined. DOE has estimated that the Klondike site and Crescent Junction site would provide ground water protection for upwards of 25,000 years. At the White Mesa site, it is estimated that ground water travel time to points of exposure at surface springs is estimated to be within 3,600 years. A possible discharge point is Ruin Spring, located about two miles south-southwest of the White Mesa Mill.

Response:

DOE acknowledges the commentor's concerns, and they will be considered in DOE's final decision-making. The responses to comments #9 and #10 address truck traffic associated with slurry transport and slurry moisture content. The EIS acknowledges that under the White Mesa Mill disposal cell conceptual design, contaminants could potentially impact surface springs within several thousand years (Section 4.4.3), which is well beyond the requisite period of compliance (200 to 1,000 years).
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Document #574 Comment #33 Commentor: U.S. Environmental Protection Agency

The possibility of pipe ruptures or leaks and potential contamination of underlying ground water and surface water resources needs to be discussed. The proposed slurry pipeline route to Klondike Flats crosses an area of shallow groundwater in the Cedar Mountain Formation. The slurry pipeline route to White Mesa crosses the Colorado River and Matheson Wetlands. Ruptures in any of these areas could result in undesirable environmental consequences and this should be addressed in the Final EIS.

Response:

DOE concurs that these events and impacts would be possible, as they are wherever pressurized infrastructure is placed. However, as described in Section 2.2.4.3, the pipeline system would include instrumentation that would detect leaks and shut the system down before a large quantity of material could be released. DOE estimates that less than 5.2 yd^3 would be spilled before system shutdown. Given this small quantity and the relatively low probability of such an accident, DOE does not believe that further analyses are warranted.
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Document #574 Comment #34 Commentor: U.S. Environmental Protection Agency

1. The time frame for operating a groundwater remediation system is given as 75 years for the off-site alternatives and 80 years for the on-site alternative. EPA agrees with the estimate for the off-site alternatives, but believes the time frame for the on-site alternative should be expressed as much longer range, for example, 80 – 1000+ years considering the very large uncertainties in the concentrations leaching through the tailings pile and long time frame the tailings pile is likely to serve as a source of leachate. The 80-year time frame is intended to represent only the period needed to flush the legacy plumes and not potentially more leaching that could result if the cover failed to all subsequent additional infiltration.

Response:

The commentor is correct that the leaching effects of an ammonia salt layer found in the upper 10 feet of the tailings pile would not be observed at the underlying water table for 1,000+ years. DOE did not simulate this effect with the flow and transport model or estimate costs, because the regulatory time period for the design of the cell is 200 to 1,000 years (40 CFR 192). Furthermore, as discussed in the SOWP (Section 6), attenuation processes (i.e., biological degradation, sorption, etc.) make it likely that ammonia concentrations in the tailings fluid near the base of the pile would be considerably less. In addition, since the salt layer is found in the upper 10 feet of the pile, it may also be possible to mitigate the salt layer by excavation and aboveground treatment prior to placing the cap. DOE would consider such mitigation if the on-site alternative were selected.

The estimated time frames of 75 years for the off-site alternative and 80 years for the on-site alternative are used in this EIS for purposes of comparing ground water remediation options. Uncertainties related to the remediation time frames, costs, etc., are addressed in Tables S−1 and 2−33, item #1. Uncertainties related to the potential salt layer are addressed in item #18 of these tables.
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Document #574 Comment #35 Commentor: U.S. Environmental Protection Agency

2. Several long-term impacts of the on-site alternatives need to be discussed in the summary section, including:

a. The high ammonia concentrations (one order of magnitude higher than current concentrations) that are anticipated to exit the tailings pile in approximately 1000 to 1500 years and potentially adversely impact ground and surface water concentrations for hundreds of years.

b. The rate at which salt bed-based dissolution subsidence under the pile could lower the pile relative to the Colorado River level which may be 1 to 1.5 foot per 1000 years. In the near term, this may lead to wetting of the base of the pile during high river stages and potentially increased contaminant concentrations entering the groundwater system. In the longer term, the subsidence will result in permanent tailings contact with the ground water.

Response:

The potential release of ammonia (comment "a") from a suspected salt layer within the pile is summarized in Tables S−1 and 2−33, item #18. The summary also indicates that natural basin subsidence would result in permanent tailings contact with the ground water in 7,000 to 10,000 years (comment "b"). The regulatory time period for the design of the cell is at least 200 years but not to exceed 1,000 years (40 CFR 192). Under the analytical assumptions in the EIS, dissolution of the salt beds and subsidence in the vicinity of the disposal site is on a geologic time frame that is well beyond the regulatory design period. However, DOE acknowledges substantial uncertainties in the long-term applicability of these assumptions, particularly beyond the time frame during which DOE can reasonably guarantee the maintenance of active institutional controls.

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Document #574 Comment #36 Commentor: U.S. Environmental Protection Agency

3. The EIS addresses only ammonia standards, as these are currently the driver for surface water impacts. The assumption is made that the other constituents of concern will be reduced to acceptable levels in the same time frame as for ammonia, but no basis is provided for this assertion. The identified constituents of concern have different solution chemistries and sorptive characteristics and, consequently, are likely to have different fate and transport projections.

Response:

As stated in the EIS, DOE presumes that these other contaminants of concern would reach protective levels within the same time frame that it would take for ammonia to reach protective levels because their concentrations are less elevated above applicable cleanup criteria (e.g., surface water standards), the constituents are less widespread, or they occur at elevated concentrations less frequently. Specifically, Section 5.6 of the SOWP (DOE 2003a) describes the distribution of major and minor constituents in the surface water system. The Biological Assessment, Screening of Contaminants (Appendix A2) evaluated these surface water data against the background concentrations as well as aquatic benchmark values. This evaluation identified only the constituents ammonia, manganese, copper, uranium, and sulfate as being contaminants of potential concern.

Section 2.3.1.2 has been expanded to include DOE's rationale on this issue. Site-specific modeling of the tailings' long-term seepage indicates that seepage rates will decrease 25-fold from the current rate of approximately 20 gpm (Figure 6−3, Table 6−3 of the SOWP) to the predicted long-term flux of 0.8 gpm. This 25-fold decrease in volumetric and contaminant mass flux from the tailings, coupled with the 10-fold average dilution of ground water observed in surface water concentrations, is anticipated to result in decreases in contaminant surface water concentrations below aquatic benchmark and/or appropriate water quality standards without any geochemical transformations beyond simple dilution, which are likely to occur as well. For example, the maximum observed copper concentrations in the surface water adjacent to the site range from approximately 5 mg/L to 14 mg/L, while the Utah Water Quality Criteria is 12 mg/L. Similarly, maximum observed manganese concentrations in surface water exceed the aquatic benchmark value of approximately 0.01 mg/L in only five locations, with the all-time maximum of 11.5 mg/L (it should be noted that natural manganese background ground water concentrations of 19 mg/L to 38 mg/L have been observed). The maximum observed uranium surface water concentration is approximately 5 mg/L, roughly 100 times the aquatic benchmark of 0.04 mg/L, and the maximum observed sulfate surface water concentration is approximately 14,000 mg/L, roughly 28 times the upper range of background sulfate concentrations (439 mg/L). Therefore, there exists a reasonable assurance that the resulting 250-fold decrease in future surface water concentrations predicted from decreased tailings seepage, coupled with ground water dilution through mixing with surface water, will result in long-term protective concentrations for all constituents of concern.

However, DOE acknowledges in the EIS that there is uncertainty in this assumption due to factors such as differences in solute transport and sorption mechanics.
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Document #574 Comment #37 Commentor: U.S. Environmental Protection Agency

4. Potential to increase the rate of leachate flushing using a pond. The following option for ground water clean-up could be investigated as a means to reduce the length of time necessary to meet surface and ground water criteria. We suggest evaluation of the advantages of creating a new hydraulic head in order to more rapidly drive the ground water plume. For the off-site alternatives, the area exposed after tailings pile removal could be designed for a shallow pond of from 4 to 6 feet. With an increased hydraulic head driving the legacy plume, the ground water and surface water quality may be able to meet standards sooner, thus reducing costs of the proposed ground water clean-up remedy.

Response:

The cleanup options presented in the EIS are for purposes of comparing alternatives. As stated in the EIS, the final long-term ground water clean-up design would be developed after the Record of Decision. Evaluation of the potential advantages in the design would be performed as part of the design process. DOE agrees that it is a good idea to explore remedial designs that could result in an expedited cleanup because, if effective, such designs may result in cost savings.

In developing the cell design, DOE would utilize knowledge and experience gained from its managing 22 UMTRCA Title I cleanup projects for more than 20 years.
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Document #574 Comment #38 Commentor: U.S. Environmental Protection Agency

DOE should emphasize that the assumptions related to capping performance for on-site remedy critically affect the estimated time to achieve the ground water remedy. The critical assumption to constructing and then maintaining the cover to assure hydraulic conductivity remains at the 10^{-8} cm/sec infiltration limitation. If this is not assured, contaminants may leach into ground water at a significantly higher rate and persist longer than currently predicted by DOE.

Response:

Table 2−33, item #1, in the EIS has been expanded to clarify this assumption and potential consequences.
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Document #574 Comment #39 Commentor: U.S. Environmental Protection Agency

The advantages of a waste cell cap design based on achieving a water balance through soil and vegetative evapo-transpiration (ET) should be investigated. DOE participated with EPA and the State of Utah in the final design and construction of an ET-water balance cover for the Monticello Mill Tailings Site. EPA's Alternative Cover Assessment Program, a program that DOE has participated in, has also shown the advantage of similar type construction in semiarid environments. We believe that the 10^{-8} cm/s hydraulic conductivity that DOE needs to attain on the cover for the cap-in-place alternative is more likely to be assured with an ET - water balance cover.

EPA studies in the ACAP program have suggested that constructing covers with compacted clay liners to achieve hydraulic conductivities of 10^{-7} cm/s has been difficult, requires extensive

Document #574 Comment #39 - continued

QA/QC, and in the long term may be problematic. Will there be lysimeters or other moisture probes in the cover to determine if the necessary saturated hydrologic conductivity and or flux through the cover is being met? Although the initial UMTRA program requirements included predictive modeling methods must show success, the latest revision of DOE's Technical Approach Document (page 220) recognized that monitoring of the cover to assure that performance criteria were met might also be necessary.

Evidence from the Monticello water balance - ET cover, indicates that the hydraulic conductivity has met or exceeded the design criteria. The Monticello cover performance data shows that the NESHAPS requirements for radon emissions were adequately met following placement and compaction of the vicinity property material. The clay barrier constructed over the vicinity property material provided redundant protection for radon emissions.

The need for a bio-intrusion barrier will depend upon the risks to cover integrity from the terrestrial rodent species present and any other rodent species which might occupy the area following completion of waste disposal cell. What additional studies will DOE conduct before making a decision as to whether or not a bio-intrusion barrier will be required? Should a bio-intrusion barrier be required, then additional rock material (cost and transportation impacts) has not been considered in the present scenarios. In addition, if construction of capillary barrier in a six-inch lift across the entire cover appears to be prohibitive due to constructability problems, then perhaps a one-foot lift would be required to meet the performance goals assumed in the design. Based on EPA's review of the conceptual design, as much as 18 additional inches of rock material over the entire cover might be required. These quantities have not been addressed in either the cost or transportation segments of the EIS or the impacts upon potential borrow areas. Note that for the Crescent Junction site, rock material necessary for both the capillary break and/or a bio-intrusion barrier appears to be available from sources close to these sites or necessary materials could be hauled in by rail to avoid additional truck hauling through Moab.

Response:

Advantages and disadvantages of different cover components (for example, a biointrusive barrier or radon barrier) would be investigated during development of the actual engineering design, which would be performed after the Record of Decision. The on-site disposal and off-site disposal designs, as stated in the EIS, are conceptual for the purpose of comparison between alternatives. Alternative sources for rock material not evaluated in the EIS for a capillary break or biointrusion layer would be examined as part of the post-Record of Decision remedial action planning. Also see response to comment #23.

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Document #574 Comment #40 Commentor: U.S. Environmental Protection Agency

Executive Summary, Page S−8 Off-Site Disposal, and second sentence: DOE estimates that the total volume of material to be removed from the site is approximately 11.9 million tons. However, DOE recently provided information that the contaminated soil adjacent, or off-pile, was at least twice the volume used to provide the 11.9-million-ton estimate (i.e., off-pile contaminated soil has increased from 234,000 tons to greater than 500,000 tons). DOE has also used in its projections a contaminated sub-pile soil thickness of only 2 feet (which results in sub-pile amount of 566,000 tons). This thickness and volume was based on limited bore hole data. EPA believes that the sub-pile contaminated thickness is understated significantly and is not supported based on conditions found at other UMTRCA piles. In order to quantify the range of materials for the alternative transportation modes, it would be prudent to use a higher estimate, perhaps up to 13 million tons. This would allow for volumes associated with off-pile contamination and contaminated materials needing removal beneath the pile.

Response:

As identified by the commentor, based on recent survey data that were not available at the time the draft EIS was developed, the Department has increased its estimate of the quantity of the contaminated off-pile soils. Currently, DOE believes that the off-pile contaminated soil volumes could be 50 to 100 percent greater than estimated for the draft EIS. However, because this represents less than 1 percent change in the total volume of material that would be transported under the off-site alternative, no changes have been made to text or tables, and the volumes given in the draft EIS have been retained for the final EIS. The Summary, Sections 2.1.1.2, 2.2.4, and other text sections have been modified to reflect this issue.

Review of the available data indicates that sub-pile soil contamination depth varies widely within a given UMTRCA site and between UMTRCA sites whose tailings have been relocated. The estimate for the Moab site was based on site-specific data. The EIS addresses the uncertainty regarding the quantity of the sub-pile soils in Section 2.6, as well as the impacts should this quantity be larger than assumed. In addition, the uncertainty of costs associated with additional remediation quantities are addressed in Section 2.7.3 through the addition of a 10-percent contingency on the total project estimate and the qualification that the budget estimate is expected to fall within the range of -15 percent to +30 percent.
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Document #574 Comment #41 Commentor: U.S. Environmental Protection Agency

Page S−10 Ground Water Compliance Strategies: The enclosed text indicates that DOE may apply for supplemental standards. Supplemental standards have to be approved by the NRC. Does the NRC support the application of supplemental standards for ground water at this site?

Response:

DOE is proposing to remediate ground water under EPA regulations 40 CFR 192, the regulations promulgated by EPA to ensure that UMTRCA sites would not be subject to regulation under both federal and state law. Regardless of whether surface remediation involved on-site or off-site disposal, active remediation is proposed for contamination remaining in ground water beneath the Moab site to prevent further degradation of surface water quality. This active remediation would be conducted in conjunction with the application of supplemental standards provided under 40 CFR 192. Applying supplemental standards would be reasonable because the natural background water quality in the alluvial aquifer is poor, as evidenced by TDS concentrations that range from a low of 677 mg/L to over 97,000 mg/L. Because ground water in the major portion of the aquifer has a TDS content exceeding 10,000 mg/L, the aquifer meets the definition of a limited-use aquifer as described in EPA's Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy (EPA 1988). DOE would work closely with the NRC to develop appropriate supplemental standards that the NRC could support.
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Document #574 Comment #42 Commentor: U.S. Environmental Protection Agency

Page S−10; Section 1.4.3 Groundwater Remediation: Last paragraph; Section 2.3.2.2. Implementation of Ground Water Remediation. Figure 2−42; Section 2.3.2.4. Active Remediation Operations; Section 2.6.1. Impacts Affecting the Moab Site and Vicinity Properties….; Table 2−32. In each of these sections, the time frame for the on-site alternatives should be expressed as a range (such as from 80 – 1000+ years) to account for the significant uncertainties in the concentrations leaching through the tailings pile and the long time frame the tailings pile is likely to serve as a source of leachate. The 80-year time frame represents with any certainty only the period needed to flush the legacy plumes.

Response:

See response to comment #34.
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Document #574 Comment #43 Commentor: U.S. Environmental Protection Agency

Page S−10 Ground Water Remediation: The second paragraph on this page identifies ammonia and other site-related constituents. Please identify the other constituents that have elevated concentrations in the Colorado River adjacent to the site. Are there concentrations or volumes in the pile that could cause excessive environmental damage in either the short-term or long-term scenario?

Response:

See response to comment #36.

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Document #574 Comment #44 Commentor: U.S. Environmental Protection Agency

Page S−12 Disposal Site, Transportation, and Vicinity Property Impacts, Geology and Soils Note that the estimate of approximately 234,000 tons of contaminated site soil needs to be increased per DOE's subsequent estimates. Please also consider the impact on the amount of soil that would be necessary to reclaim the site. DOE has indicated that 424,867 yds3 of material would be brought back to the site for reclamation in the event that the pile is moved. Since much of the remaining off-pile contaminated material appears to be at the toe of the pile and/or in levees constructed during operations at the site, does DOE believe this estimate for reclamation is adequate or should this be increased?

Response:

The commentor is citing the summary of the document. Based on recent survey data that were not available at the time the draft EIS was developed, the Department has increased its estimate of the quantity of the contaminated off-pile soils. Currently, DOE believes that the off-pile contaminated soil volumes could be 50 to 100 percent greater than estimated for the draft EIS. However, because this represents less than 1 percent change in the total volume of material that would be transported under the off-site alternative, no changes have been made to text or tables, and the volumes given in the draft EIS have been retained for the final EIS. The Summary, Sections 2.1.1.2, 2.2.4, and other text sections have been modified to reflect this issue.

Section 3.1.3.1 also acknowledges that the actual volume of windblown contamination may exceed the estimated volume characterized by a range of 50 to 100 percent, which is consistent with DOE's experience at other UMTRCA sites. Section 2.2.1.3 of the EIS states that the volume of reclamation soil is approximate. Table 2−33, item #4, specifically addresses the uncertainty associated with the mass and volume of excavated contaminated soil and reclamation soil. It is likely that the estimated volumes could be greater. However, the volumes of contaminated soil and reclamation soils presented in the EIS represented DOE's best estimate based on currently available information, and they were used as a constant for purposes of comparing alternatives and assessing impacts relative to each alternative. DOE would adjust these estimates in the remedial action plan if more current or precise data so dictates.

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Document #574 Comment #45 Commentor: U.S. Environmental Protection Agency

Page S−14 Surface Water: DOE states that the removal of the pile coupled with the estimated 75 years of active ground water remediation would result in permanent protection of surface water quality. In the next sentence, DOE suggests that equal protection will be provided for the on-site disposal alternative if active ground water remediation continues for an estimated 80 years. DOE should mention the critical assumptions under which this will occur and how this is connected to the designed hydraulic conductivity of the cover of achieving the10^{-8} cm/sec design and how would this time be extended due to the potential effects from a 100-year and or 500-year flood event?

Response:

Critical assumptions, including the saturated hydraulic conductivity used in the ground water flow and transport model, are described in Section 6 of the SOWP. The consequence of using an erroneous value for the ground water transport or flow input parameters is described in the EIS (Tables S−1 and 2−33). Details of the uncertainties are provided in the prediction uncertainty analysis section in the SOWP.

Under the 100-year flood scenario, the river level would be approximately 4 feet above the toe of the pile, as occurred during the 1984 flood. During this flood, the unprotected pile was not breached because velocities decrease when the river flows over its banks. In the EIS, DOE acknowledges the potential for the pile to be inundated during floods (Sections 4.1.1 and 4.1.3). If the on-site disposal alternative were selected, the side slopes would be protected by riprap and the toe of the pile would be protected by an engineered barrier to mitigate against river encroachment, as described in the EIS. While additional ground water contaminants would likely be released to the environment during 100-year or greater floods, the resulting impacts to human health and the environment would not be catastrophic and have been discussed in Section 4.1.3 of the EIS. The EIS further states, in Section S.1 and Section 4.1.3.1, that under the on-site disposal or No Action alternatives, a Colorado River 100- or 500-year flood event could release additional contamination to ground water and surface water. The EIS also states that under the on-site alternative, the increase in ammonia concentrations due to floodwaters inundating the pile would be minor, and the impact on river water quality would rapidly decline over a 20-year period.

It should also be noted that based on technical literature (Howell and Shackelford 1997; Estronell and Daniel 1992) and experience with other cover designs (Albright et al. 2004), the Department has a reasonable assurance that a cover can be successfully constructed with saturated hydraulic conductivity values that meet the ground water protection strategy requirements (1×10^{-8} cm/s). Further, it is explicitly contemplated in UMTRCA that long-term stewardship, including monitoring and maintenance of the institutional and engineering controls, would be applied to the site to ensure long-term performance and protection of public health and the environment. Also see responses to comments #23 and #39.

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Document #574 Comment #46 Commentor: U.S. Environmental Protection Agency

Page S−17 Cultural Resources: Because 20 to 25 cultural resource sites potentially impacted with the Klondike and Crescent Junction alternatives are principally due to the slurry pipeline new construction and the new Klondike borrow areas, this summary seems to overstate these cultural resource impacts with respect to both the truck or railroad alternative transport methods.

Response:

The Summary states that "The Klondike Flats alternative could adversely affect a maximum of 35 to 53 eligible sites (depending upon transportation mode)...". Under the truck option, a maximum of 36 sites could be affected, and under the rail option, a maximum of 35 sites could be affected (see Tables S−5 and 2−32). Neither of these numbers includes the 6 to 20 sites that could be adversely affected by pipeline construction under the slurry option (a total of 53 sites could be adversely affected under the slurry option). Therefore, no overstatement has been made for the truck and rail options. Section 4.2.9.5 and Table 4−24 of the EIS provide details of how these numbers were calculated. Likewise, under the Crescent Junction disposal alternative, the numbers of cultural sites that could be adversely affected under the truck and rail options (12 and 11, respectively) do not include cultural sites that could be affected by pipeline construction. Section 4.3.9.5 and Table 4−32 provide details of cultural impacts associated with the Crescent Junction alternative.
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Document #574 Comment #47 Commentor: U.S. Environmental Protection Agency

Page S−19 Visual Resources: The newly constructed disposal cell need not necessarily have a strong contrast with the surrounding natural landscape. This will depend on the final cell configuration, the materials used to construct the cover, and other landscaping that DOE employs to mitigate the contrasts. Elsewhere in the EIS it states that the present pile has a moderate contrast with the surrounding landscape. If proper materials are selected, it would appear that the final disposal cell would not be significantly different from the current moderate contrast to visual conditions.

Response:

The Summary states that the strong contrast formed by the newly constructed cell would lessen slightly over time. The EIS provides further detail. Section 4.1.11.1 states that the final disposal cell would have a moderate contrast with the surrounding landscape in the long term. The commentor is correct in that this would not be significantly different from the current moderate contrast.
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Document #574 Comment #48 Commentor: U.S. Environmental Protection Agency

Page S−33 text and Figure S−24 Borrow Material: Based on prior experience by EPA staff, we believe the amount of rock riprap and the gravel necessary for construction of an adequate capillary break may be underestimated. The construction of a 6-inch capillary break across the pile may have significant constructability and performance issues. If a bio-intrusion layer were needed, it would also increase the amount of rock required for the on-site cell significantly.

Response:

As stated in the EIS, the cover design is conceptual for purposes of evaluating alternatives. Details of the actual design would be developed after the Record of Decision. In developing material estimates for the cell and borrow materials, DOE utilized knowledge and experience gained from its managing 22 UMTRCA Title I cleanup projects for more than 20 years. DOE believes the estimates in the EIS are appropriate. However, DOE recognizes and has acknowledged that uncertainties exist that could affect these estimates. For example, in the EIS, DOE acknowledges that uncertainties exist in estimates of the mass and volume of excavated contaminated material and reclamation soil (see response to comment #44). These uncertainties would have a flow-down effect specifically addressed in the “consequences” section of this uncertainty.

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Document #574 Comment #49 Commentor: U.S. Environmental Protection Agency

Page S−34 Consequences of estimating cost and impacts, third paragraph: This states that: "DOE has employed reasonable conservatism in characterizing the costs, resources and impacts…" However, the volume of material could be greater, diesel prices may increase, and the schedule may be extended. DOE estimates a total volume of tailings of 11.9 million tons; however, the volume of tailings that was eventually moved at other UMTRCA sites usually exceeded the volume characterized during the planning period by significant percentages. If DOE would use an estimate of 13 million tons to estimate cost for off-site disposal, this might better reflect upon this prior experience. Second, diesel fuel prices have increased significantly since the initial draft EIS information was prepared. DOE's proposed schedules are optimistic projections. During public presentations, the DOE staff usually identify that its predicted schedules are optimistic and may not be realized. Significant time delays will also increase the overall cost.

Response:

DOE acknowledges uncertainties in the Summary (Table S−1) and in the EIS (Section 2.6.3). Cost is one of those uncertainties (Section 2.7.3). Given that costs are a function of the volume of tailings remediated, time, fuel prices, and other factors, DOE acknowledges that costs are estimates only. Section 4.1.14 discusses the basis for the estimates. While costs would be higher for off-site removal, many factors, including potential future environmental impacts, will be considered in DOE's final decision-making.
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Document #574 Comment #50 Commentor: U.S. Environmental Protection Agency

Page S−36 Table S−1, Ground Water and Site Conceptual Model Assumptions: A significant uncertainty which needs to be addressed in the Final EIS is the problem of constructing a cap or cover which will retain the necessary hydraulic conductivity over the long term (cover capable of assuring a hydraulic conductivity of less than 10^{-8} cm/sec).

Response:

See responses to comments #23, #39, and #45.
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Document #574 Comment #51 Commentor: U.S. Environmental Protection Agency

Page S−38 Table S−1, Consequences of underestimating mass and volume of excavated contaminated soil and reclamation soil: DOE states that under the on-site disposal alternative, there would be a commensurate increase in the amount of material to be disposed of in the Moab pile (surcharge). If DOE intends to construct a convex cover with positive drainage, the existing bowl within the concave repository could accommodate the off-pile contaminated materials. As stated previously, there are other reasons to believe that the amounts of material to reclaim the site and construct the repository cover may be significantly underestimated.

Response:

See responses to comments #44 and #48.
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Document #574 Comment #52 Commentor: U.S. Environmental Protection Agency

Page S−45 Table S−1 Consequences of low cost estimates: The uncertainties of cost projections of each alternative should be highlighted, since the uncertain factors included in this table could result in significant cost changes to each alternative, perhaps on the order of 50 percent greater than the present cost estimates, if the worst case of each uncertain factor did occur.

Response:

Annual costs that would result from uncertainties are included in Tables S−1 and 2−33 under the individual uncertainty discussions. Because neither the likelihood of occurrence nor the duration of each identified uncertainty can be established, the cumulative cost of all uncertainties cannot be meaningfully calculated. The uncertainty of costs is in part addressed in Section 2.7.3 through the addition of a 10-percent contingency on the total project cost estimate and the qualification that the budget estimate is expected to fall within the range of 15 percent to +30 percent. It is DOE's opinion that the existing cost analyses, along with the environmental impact analyses provided in the EIS, consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, will be sufficient to support DOE's final decision for remediation of the Moab site.
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Document #574 Comment #53 Commentor: U.S. Environmental Protection Agency

Page S−47 Major Conclusions, fourth bullet: There are many uncertainties as to whether the construction and performance of the cap-in-place will perform as designed. If the cap fails to perform as designed, this will potentially impact the length of time necessary to remediate the ground water because maintaining the design hydraulic conductivity of the cover over the long term will be difficult to assure.

Response:

The commentor is correct that if the cap failed to perform as designed, then the time frame to reach the proposed 3-mg/L ammonia ground water concentration would potentially be extended. It is also possible that the 3-mg/L ammonia concentration would not be achieved. However, based on technical literature (Howell and Shackelford 1997; Estronell and Daniel 1992) and experience with other cover designs (Albright et al. 2004), the Department has a reasonable assurance that a cover can be successfully constructed with saturated hydraulic conductivity values that meet the ground water protection strategy requirements (1×10^{-8} cm/s). Further, it is explicitly contemplated in UMTRCA that long-term stewardship, including monitoring and maintenance of the institutional and engineering controls, would be applied to the site to ensure long-term performance and protection of public health and the environment. Also see responses to comments #23 and #39.
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Document #574 Comment #54 Commentor: U.S. Environmental Protection Agency

Page S−47 Major Conclusions, fifth bullet: The way that this statement is worded suggests that the White Mesa Mill already has a cell constructed. While the IUC Corporation has received a permit for a cell suitable for disposal of the Moab tailings, a final cell design may require extensive modifications prior to attaining final approval. The overall impact of constructing the cell at White Mesa and all the ancillary facilities that will be required for the slurry pipeline, coupled with the inherent operational uncertainties of such an endeavor, need to be carefully considered and more thoroughly evaluated prior to selecting this alternative.

Response:

The statement has been reworded to more clearly identify that a disposal cell does not yet exist to accept the Moab tailings. The proposed action for the White Mesa Mill alternative is described in Section 2.2.5, and the associated impacts are addressed in Section 4.4. The treatment of this alternative presented in the EIS is adequate to support informed decision-making.
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Document #574 Comment #55 Commentor: U.S. Environmental Protection Agency

Page S−47 Major Conclusions, ninth bullet: EPA concurs with DOE that the “No Action” alternative poses the greatest risk to human health over the long term and exposures to the public at vicinity properties poses the greatest risk. DOE should go forward with clean-up of the vicinity properties at its earliest opportunity independent of any delays associated cap-in-place or moving the tailings to an off-site repository.

Response:

DOE acknowledges EPA’s concurrence that the No Action alternative poses the greatest risk. DOE intends to initiate remedial actions at included vicinity properties following the Record of Decision.
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Document #574 Comment #56 Commentor: U.S. Environmental Protection Agency

Page 1−7, Off-Site Disposal Option: We suggest that DOE consider increasing its estimate from 11.9 million tons of contaminated material up to 13 million tons. This will provide a more conservative estimate for purposes of addressing overall costs and the transportation impacts associated with the various alternatives. This is also supported by recent DOE surveys which indicate the off-pile contamination has increased to more than 500,000 tons. It will also account for an increase in the depth of contamination beneath the pile based on similar DOE experience at other UMTRCA sites. The estimated depth of contamination beneath the pile of 2 feet is based on limited borehole data and may not include tailings placed in the hole that resulted from the excavation and construction of the berms that surrounded the original tailings impoundment.

Response:

See response to comment #44 regarding off-pile contamination and changes in DOE's estimates. The Department's review of the available data indicates that sub-pile soil contamination depth varies widely within a given UMTRCA site and between UMTRCA sites whose tailings have been relocated. The estimate for the Moab site was based on site-specific data. The EIS addresses the uncertainty regarding the quantity of the sub-pile soils (Section 2.6) as well as the impacts should this quantity be larger than assumed. In addition, the uncertainty of costs associated with additional remediation quantities is addressed in Section 2.7.3 through the addition of a 10-percent contingency on the total project estimate and the qualification that the budget estimate is expected to fall within the range of -15 percent to +30 percent. Therefore, the Department believes that the existing analysis is sufficient to support decision-making.
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Document #574 Comment #57 Commentor: U.S. Environmental Protection Agency

Page 1−8, White Mesa Mill: Perhaps DOE should remove the word likely in the statement that reads "…expansion of the existing facility would likely be necessary". Such a statement suggests that the disposal cell necessary for the Moab tailings alternative has already been constructed.

Response:

Section 1.4.2 of the EIS has been modified to address the comment.
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Document #574 Comment #58 Commentor: U.S. Environmental Protection Agency

Page 1−10, 4th paragraph, 2nd sentence: With all the unknowns surrounding the selection of an alternative, the transportation mode, and clean-up of the off-pile contamination, the statement that the ground water remediation system will be completed in 2009 or approximately 5 years after issuance of a ROD appears to be optimistic.

Response:

The schedule set forth in the EIS to complete "construction" of the ground water system within 5 years of the Record of Decision is based on several factors, including time to complete the surface remedial action plan and the ground water remedial action plan. As the text stipulates, completion of the ground water remedial action is expected to require 75 to 80 years. While this schedule is aggressive, DOE believes it is achievable and consistent with stakeholder comments to expedite the remediation schedule.

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Document #574 Comment #59 Commentor: U.S. Environmental Protection Agency

Page 2−9, Borrow Material Storage Area: EPA recognizes that this is only a conceptual plan: however; we would question the proposed size of the borrow storage area. Based on the sequencing proposed (i.e., radon barrier, sand and gravel, water storage layer and riprap would all need to be available on site to construct the side slopes), does DOE believe five acres would be a sufficient area based on the quantity of materials necessary to maintain a construction schedule and the size and mobility requirements of the tandem trucks that would be hauling the material to the site?

Response:

The commentor is correct in recognizing that this is only a conceptual plan. Due to the limited area available for material stockpiles, efforts would be made to minimize on-site borrow stockpile volumes by coordinating the supply of borrow materials with construction-handling capacity to maintain minimal inventories. The actual size of the borrow stockpile area would likely vary through time, but an estimate of 5 acres is reasonable at this phase of design.

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Document #574 Comment #60 Commentor: U.S. Environmental Protection Agency

Page 2−20, Section 2.1.3.1 Borrow Material Standards and Requirements, Riprap: Will 12-inch nominal riprap material be adequate to construct the riprap diversion wall necessary to protect the pile?

Response:

The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS to state that riprap materials would be sized to withstand the maximum river forces recently identified by USGS. In addition, the barrier wall would be of sufficient length and robustness to mitigate against river encroachment.

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Document #574 Comment #61 Commentor: U.S. Environmental Protection Agency

Page 2−22 through 2−25, Section 2.1.3.2 Borrow Material Excavation and Transportation Options through Section 2.1.5.2 Equipment: EPA staff provided comments as part of the Cooperative Agency review on the preliminary Draft EIS document, that the number of truck trips, number of trucks, and the number of truck drivers necessary to move borrow materials for reclamation and/or cover materials to the site could not be verified based on the data provided in this section, the accompanying tables and subsequent sections in the EIS. Many of the problems addressed previously still remain in the present draft.

For example, page 2−22 item 4 indicates that approximately 5 trucks would be necessary to haul the borrow material, cover material, and radon barrier material to the site. Elsewhere, Table 2−2 indicates a total of 43 daily round trips are required for the movement of borrow material for the on-site alternative. Table 2−4 Average Annual Labor Requirements indicates that a total of 41 truck drivers are necessary and Table 2−5 indicates that the number of tandem trucks needed to haul borrow materials is 28. These tables and numbers do not appear to be consistent with those presented in Tables 2−16 through 2−21. It is difficult for DOE to establish the costs of the on-site alternative without using consistent sets of information to prepare the project cost estimates.

Response:

The text and table cited have been revised to be internally consistent. DOE acknowledges uncertainties associated with the truck transportation mode. DOE's cost estimates include contingencies. However, in DOE's opinion, the data in the EIS are sufficient to compare alternatives and the impacts associated with each.

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Document #574 Comment #62 Commentor: U.S. Environmental Protection Agency

Page 2−32, Figure 2−13 - Although this is only a schematic, one area proposed for tailings handling raises a potential concern. DOE proposes tailings handling and processing areas within the 100-year floodplain of Moab Wash and the Colorado River (See Appendix D, page D−2). Is it correct that these tailings handling areas will not be lined? The proposed storm control berms and the tailing processing area would be flooded in the 100-year event and perhaps even in a 50-year flood event.

Response:

For the EIS, it has been assumed that the tailings handling areas would not be lined. Final design decisions would not occur until after the Record of Decision; design details would then be addressed in a remedial action plan. In Section 4.1.5.1 of the EIS and in the Floodplain Statement of Findings (included in Appendix F), DOE acknowledges the potential for short-term impacts in the floodplain as a result of working in the floodplain during remediation. To minimize this potential, DOE would implement necessary mitigation (see Appendix F4.2). Section 2.1.1 has been revised to be consistent with F2.1.2 and to indicate that berms would be constructed to heights in excess of a 100-year flood event. Detailed operational controls would be included in the remedial action plan following the Record of Decision. Also see response to comment #24 regarding rerouting and enhancing Moab Wash.

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Document #574 Comment #63 Commentor: U.S. Environmental Protection Agency

Page 2−49, Figure 2−10 Summary Logistics for Rail Transportation: DOE has estimated there will be 2,188 truckloads of debris which would not be suitable for rail transport because of size constraints and the handling ability of the conveyor belt. Elsewhere in the Draft EIS, the same number of truckloads for transport of debris is used for an off-site alternative, despite the size requirements for transport of particles via the pipeline (i.e., material could not exceed .03 inches in diameter in order to be transported by slurry). What characterization studies have been conducted of the on-site and off-site vicinity property material to substantiate this estimate?

Response:

As currently envisioned, the conveyor system would not be capable of handling large oversized debris; these materials would be hauled to off-site disposal by truck. These estimates are based on available project information but do not include intrusive sampling into the tailings pile.
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Document #574 Comment #64 Commentor: U.S. Environmental Protection Agency

Page 2−51, Line 1 - question follows up on the comment pertaining to Figure 2−10 - DOE has estimated that approximately 35,000 yd^3 of oversize debris material would need to be hauled by truck to the Crescent Junction or Klondike Flats disposal site. Further on in Table 2−20, Average Annual Equipment Requirements - Rail Transportation Mode, and Table 2−21 Slurry Pipeline Transportation Mode DOE estimates that 2 to 5 tandem trucks would be required to haul the debris to the Crescent Junction or Klondike Flats sites. Elsewhere (and in a prior response to EPA comments) DOE indicated that debris would be hauled in 16-yd trucks. Please note that these tables need to be changed to reflect 16-yd capacity trucks as stated elsewhere in the document.

Response:

Debris could be potentially transported by either tandem trucks or by 16-yard trucks, as appropriate. However, as indicated on the tables, tandem trucks have been assumed to be used for debris haul.
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Document #574 Comment #65 Commentor: U.S. Environmental Protection Agency

Page 2−51, Conveyor System: If rail transportation is going to be successful, the conveyor system and loading facility (hopper at the load-out) will be key pieces of equipment. Assuming continuous operation and the throughput volume of material, the conveyor belt and hopper system will need to have a capacity of approximately 500 tons an hour to sustain a schedule of loading four (4) trains per day. To provide some certainty in the loading of a train, it may require that the hopper have the capacity to fill out a complete car set of 30 cars at 100 tons per car for 3000 tons per train. This information should be included in the Final EIS.

Response:

DOE acknowledges the commentor's concerns. In the remedial action plan, the information and recommendations provided in the comment and the level of detail that would need to be addressed would be key considerations.
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Document #574 Comment #66 Commentor: U.S. Environmental Protection Agency

Page 2−52, Klondike Flats Site Rail Construction and Reclamation and Figure 2−22 **–** The Final EIS should include the explanation that this is a conceptual plan and suggests one possible site configuration for providing access to the Klondike Flats site. Alternate access and egress sites are possible and will need to be evaluated carefully prior to settling upon a final design.

Response:

The text in Section 2.2.4.2 has been amended to reflect the conceptual nature of the configuration at both the Klondike Flats and Crescent Junction sites.
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Document #574 Comment #67 Commentor: U.S. Environmental Protection Agency

Page 2−77, Soil Rock Admixture Layer - This paragraph indicates that the maximum diameter of the riprap material would be 12 inches. However, the intended thickness of the rock admixture layer is only six inches. Although a nominal riprap of 12 inches may be appropriate and constructible for the side slopes over the buttress, it may not be readily constructible over the cover, nor is it desirable as part of the water storage component of the cover.

Response:

The cover design as stated in the EIS is conceptual for purposes of evaluating alternatives. Details of the actual design would be developed after the Record of Decision.
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Document #574 Comment #68 Commentor: U.S. Environmental Protection Agency

Page 2−82 Table 2−17, Average Annual Labor Requirements - Rail Transportation Under the heading ‘Transportation Labor’, please re-evaluate the need for 3 to 6 truck drivers to haul debris or oversize material. Based on DOE’s estimates of the volume of debris that would need to be hauled by truck to the Klondike Flats and Crescent Junction sites, this number of truck drivers appears to be high. However, this number may be appropriate for the White Mesa alternative site because of the time needed to complete each round trip for this significantly longer haul distance.

Response:

DOE acknowledges the commentor’s concerns. DOE would evaluate and determine the number of drivers needed in the development of the remedial action plan.
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Document #574 Comment #69 Commentor: U.S. Environmental Protection Agency

Page 2−83, Table 2−16, Table 2−17 and Table 2−8 Average Labor Requirements - Slurry Pipeline Transportation: Why will there be a need to increase the Construction Labor Site Support staff under the double-shift scenario for truck or rail haul? This does not seem appropriate for the slurry pipeline alternative since this is presumed to be a continuous 24-hour daily operation. The text and footnotes for these tables should indicate these dual numbers to indicate the difference for a single shift versus the double shift. Wouldn’t site support at Moab need to increase by 67 percent in the two ten-hour shift scenario? This increase in labor for site support is not reflected in the tables.

Response:

If a second work shift were added, a proportional amount of labor would be required to support the increased activity. The slurry operation would be a 24-hour operation, but the activities associated with site excavation to get the material to the slurry pre-treatment plant would not, and hence would not require an increase in labor for that portion of the work. The text and footnote indicate increases where it is appropriate for the activity. Site support would increase by 67 percent, as stated in Section 2.2.7.1.
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Document #574 Comment #70 Commentor: U.S. Environmental Protection Agency

Page 2−88, Table 2−23, Estimated Annual Fuel Consumption The Final EIS should provide greater detail on the consumption of fuel. This section on fuel consumption is not yet fully supported and rather abbreviated. Figure 2−51 on page 2−127 indicates the comparison of fuel consumption by alternative disposal site and transport modes. The information on this figure should be converted into a table and should replace the existing table on page 2−88.

Response:

Table 2−23 states that the fuel consumption volumes are estimates only. DOE concurs with the commentor that this section is abbreviated. However, DOE believes these estimates are sufficient for assessing impacts and evaluating differences among the alternatives analyzed in the EIS.
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Document #574 Comment #71 Commentor: U.S. Environmental Protection Agency

Section 2.3.2.4. Active Remediation Operations, page 2−107 Table 2−31. This table indicates that remediation target goals will be achieved by the on-site alternative after 80 years of operation of the ground water remedy. This appears to be unlikely, given the certainty that the tailings pile will continue to serve as a source of contamination for hundreds to thousands of years. This issue is discussed in some portions of the EIS (e.g., Page 2−109), but it is not fully considered in the discussions regarding the on-site, cap-in-place alternative.

Response:

Section 2.3.2 references the SOWP as the source document for the Department's predictions, which presents the technical basis in greater detail than was appropriate for discussion in the EIS. The prediction was based on site-specific characterization of the tailings source term and the calibrated flow and transport model under the presumption that the tailings remain a perpetual source of contaminant loading to the ground water system. In addition, the uncertainty associated with the prediction is discussed in Section 2.6. See also response to comment #34.
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Document #574 Comment #72 Commentor: U.S. Environmental Protection Agency

Page 2−125, Visual Resources - There will be strong visual contrasts at the Moab site during the five-year to ten-year construction period for either an on-site or off-site disposal alternative. However, it is not clear why the on-site alternative would have strong adverse impacts to visual resources during the long term. If the existing pile creates a "moderate" contrast as stated in the Draft EIS, then it is very likely that the final pile after 10 or 15 years would also result in being considered a "moderate" contrast. The present emphasis suggests that the contrast following construction of the cap in place would be a 'strong visual contrast.' This degree of visual contrast will be dependent upon the slope of the pile, and the materials utilized (i.e., soils, riprap and vegetation). The Final EIS for this section should include the mitigation measures as addressed in Section 4 regarding reducing the visual contrast.

Response:

The referenced text states that: "Under the on-site disposal alternative, adverse impacts to visual resources would occur during the short and long terms. Contrasts between the surrounding natural landscape and the newly constructed disposal cell would be strong and would attract the attention of casual observers. Although these contrasts would lessen slightly over time...." Section 4.1.11.1 states that the final disposal cell would have a moderate contrast with the surrounding landscape in the long term. The commentor is correct that this would not be significantly different from the current moderate contrast.

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Document #574 Comment #73 Commentor: U.S. Environmental Protection Agency

Page 2−166, Table 2−33 - Consequences of Uncertainty, Item 1 - Ground Water and Site Conceptual Model Assumptions: EPA technical and professional staff concur that there are tremendous uncertainties associated with the ground water and site conceptual models. However, DOE's assessment that without catastrophic events surface water quality would be sustained for 1000 years cannot be assured. This is because the non-catastrophic events also significantly impact surface and ground water in the relatively short term. For example, what are the impacts for the proposed the cover on the tailings pile if it cannot achieve a saturated hydraulic conductivity flux rate of 10^{-8} cm/s?

Response:

The impacts of using an erroneous value for the ground water transport or flow input parameters are described in the EIS (Table S−1 and 2−33). As stated in the EIS, if a saturated hydraulic conductivity of 1×10^{-8} cm/s cannot be met for the on-site disposal alternative cover, then the proposed ground water concentration goal of 3 mg/L ammonia cannot be achieved. Details of the uncertainties are provided in the prediction uncertainty analysis (Section 7 in the SOWP). The degree of impact can be assessed by examining the worst-case scenario. For example, the No Action disposal alternative cover with a saturated hydraulic conductivity of 1×10^{-7} cm/s indicates that a maximum ground water concentration of approximately 6 mg/L ammonia would be achieved after 75 years. This concentration is twice as high as the ground water goal of 3 mg/L ammonia achievable for the on-site disposal alternative cover. However, it is unlikely that the saturated hydraulic conductivity for the on-site disposal alternative cover would degrade to the degree of the No Action cover. Therefore, the resulting impact would result in ground water concentrations greater than 3 mg/L but less than 6 mg/L.

However, based on technical literature (Howell and Shackelford 1997; Estronell and Daniel 1992) and experience with other cover designs (Albright et al. 2004), the Department has a reasonable assurance that a cover can be successfully constructed with saturated hydraulic conductivity values that meet the ground water protection strategy requirements (1×10^{-8} cm/s). Further, it is explicitly contemplated in UMTRCA that long-term stewardship, including monitoring and maintenance of the institutional and engineering controls, would be applied to the site to ensure long-term performance and protection of public health and the environment.
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Document #574 Comment #74 Commentor: U.S. Environmental Protection Agency

Secondly, we suggest that the 100-year flood should be categorized as a ‘catastrophic event.’ Based on the recent historical record, there have been at least four such flood events since the 1880’s. Such flood events will inundate the toe of the tailings pile and depending on the duration of the flooding, may reintroduce additional contaminants into the ground water plume.

Response:

See response to comment #24. The term “catastrophic” is admittedly subjective and less precise than “100-year” or “500-year” flood, which can be documented by historic or geologic records. Based on DOE’s analyses and the velocities projected in the recent USGS report, while additional contaminants would be expected to leach from the pile over time, neither the 100- nor the 500-year flood would have catastrophic effects on the pile.
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Document #574 Comment #75 Commentor: U.S. Environmental Protection Agency

Page 2−167, Table 2−33 Consequences of Uncertainty, Item 2 - Tailings Characteristics (Nonradiation): We concur with the observation regarding uncertainties for average moisture content; however, the Final EIS information should include a discussion of the uncertainties associated with the process of pressing and drying of tailings to meet optimal moisture content for placement and compaction. Once placed into a cell, even if placed at optimal moisture content, transient drainage will continue for perhaps 25 years and if the tailings were to be placed at conditions above the optimal moisture content, then transient drainage from such tailings may extend for longer periods of time. The Mancos Shale beneath the Klondike and Crescent Junction provides much greater protection to surface and ground water than does the White Mesa site. DOE has estimated that the Klondike site and Crescent Junction site would provide ground water protection for upwards of 25,000 years. At the White Mesa site, it is estimated that ground water travel time to points of exposure at surface springs is estimated to be within 3,600 hundred years. A possible discharge point is Ruin Spring located about 2 miles south-southwest of the White Mesa Mill.

Response:

As stated in Table 2−33, the uncertainty regarding tailings moisture content would affect the time required for drying and obtaining optimum moisture content for emplacement. However, the fate of the transient drainage fluids is not relevant for the Klondike Flats and Crescent Junction sites given the high degree of geologic isolation offered by these sites. The potential settlement of the pile due to volume changes from the drainage is not anticipated to be sufficient to compromise the long-term cover performance. DOE concurs that initial research shows the Klondike Flats and Crescent Junction sites would be more protective of ground water than the White Mesa Mill site, as stated in the EIS. The EIS shows a potential for ground water to reach points of exposure at the White Mesa Mill site within 3,600 years, and DOE will consider this in its decision-making process.
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Document #574 Comment #76 Commentor: U.S. Environmental Protection Agency

Page 2−175, Table 2−33 Consequences of Uncertainty, Item 18 - Salt Layer Migration: DOE acknowledges the possibility that a salt layer exists at some depth in the pile. Modeling has indicated that the layer could reach the ground water in approximately 1,100 years and could continue to impact ground and surface water for 440 years. When these numbers were projected, the saturated hydraulic conductivities and flux were assumed to be 10^{-8} cm/s. What would be the time frame if the saturated hydraulic conductivities and or flux into the tailings were 10^{-6} cm/s? This uncertainty should be discussed and addressed in the Final EIS.

Response:

The time frame for a saturated hydraulic conductivity value greater than 1×10^{-8} cm/s can be assessed by examining the No Action disposal alternative. For example, the No Action disposal alternative cover with a saturated hydraulic conductivity of 1×10^{-7} cm/s indicates that the breakthrough time for the ammonia from the salt layer to first exit the base of the tailings is approximately 168 years and would continue for approximately 49 years. It is unreasonable, for purposes of comparing alternatives in the EIS, to consider a saturated hydraulic conductivity of 1×10^{-6} cm/s, which is greater than the No Action disposal cover (the worst-case scenario).

Details of the uncertainties are provided in the prediction uncertainty analysis (Section 7 of the SOWP) and are discussed in the EIS (Table S−1 and 2−33). As stated in the EIS, if a saturated hydraulic conductivity of 1×10^{-8} cm/s cannot be met for the on-site disposal alternative cover, then the proposed ground water concentration goal of 3 mg/L ammonia cannot be achieved.

However, based on technical literature (Howell and Shackelford 1997; Estronell and Daniel 1992) and experience with other cover designs (Albright et al. 2004), the Department has a reasonable assurance that a cover can be successfully constructed with saturated hydraulic conductivity values that meet the ground water protection strategy requirements (1×10^{-8} cm/s). Further, it is explicitly contemplated in UMTRCA that long-term stewardship, including monitoring and maintenance of the institutional and engineering controls, would be applied to the site to ensure long-term performance and protection of public health and the environment. Also see responses to comments #23, #39, #45, and #73.

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Document #574 Comment #77 Commentor: U.S. Environmental Protection Agency

Page 2−175, Table 2−33, Consequences of Uncertainty, and Item 19 Use of Tandem Trucks: The EIS notes that for the tailings haul, there is a question whether permissions from UDOT will be obtained to allow the use of tandem trucks. However, will sand and gravel, riprap and other required reclamation materials for the cap-in-place necessarily be delivered via tandem truck? DOE needs to address these different and uncertain methods of truck hauling into the Final EIS regarding the transport of riprap, borrow material, and sand and gravel. It appears that utilizing trucks that contractors currently have available would be more likely. Recognizing these specific uncertainties will also be consistent with the assumptions utilized in the NRC's EIS regarding this matter.

Response:

DOE will consider these uncertainties in weighing the alternatives. In developing the remedial action plan for actions involving truck transport, DOE would determine which trucks should be used for borrow materials. Factors that would be considered include regulatory constraints (e.g., UDOT approval), project transportation needs, and safety.
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Document #574 Comment #78 Commentor: U.S. Environmental Protection Agency

Page 3−9, Millsite Contamination. Please see previous comment regarding the volume of tailings. To properly clarify the range of the expected volume of material, we suggest that the volume of contamination for purposes of projecting impacts use an estimate of 13 million tons. As stated previously, this is probably more realistic based on the recently increased estimates of off-pile contamination and the relatively paucity of data available regarding the depth of contamination under the pile.

Response:

See comment #44 regarding changes to off-pile contaminated soil estimates. The EIS addresses the uncertainty regarding the quantity of the remediated materials in Section 2.6 as well as the impacts should this quantity be larger than assumed. In addition, the uncertainty of costs associated with additional remediation quantities are addressed in Section 2.7.3 through the addition of a 10-percent contingency on the total project estimate and the qualification that the budget estimate is expected to fall within the range of -15 percent to +30 percent. Therefore, the Department believes that the existing analysis is sufficient to support decision-making.
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Document #574 Comment #79 Commentor: U.S. Environmental Protection Agency

Page 3−11, Section 3.1.3.1 Mill site Contamination. The range, as well as average concentrations of contaminants, should be given.

Response:

The requested data are available in the SOWP as cited in the EIS. DOE does not believe this level of detail is needed in the EIS.
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Document #574 Comment #80 Commentor: U.S. Environmental Protection Agency

Page 3−61, Section 3.1.15 Visual Resources: Please clarify whether the BLM presently characterizes the Moab site as Class II, or does the pile already cause the site to be classified as Class III? Why do the existing conditions in the Spanish Valley with its residential and commercial development aspects, meet a Class II objective? Recognizing that the valley is presently a Class III visual resource is important for identifying impacts of various alternatives in subsequent impact analysis.

Response:

BLM typically does not classify visual resources on lands that are not managed by BLM. The text states that "BLM classifies the area surrounding the Moab site as Class II...." Section 3.1.15 has been clarified to state "BLM classifies BLM-managed lands surrounding the Moab site as Class II." DOE's Moab site and the residential and commercial portions of the Spanish Valley have no visual classification. As stated in Section 4.1.11.5, the BLM visual classification system was used because it provides a useful way to measure the effects of a proposed action on visual resources.
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Document #574 Comment #81 Commentor: U.S. Environmental Protection Agency

Page 3−58, line 64 and 65 - DOE makes reference to the day/night dBA-weighted sound level which uses a ten-fold or ten-decibel penalty, for night time sound. The Final EIS should more thoroughly address the night time and potentially sleep-disruptive noise impacts for the community residents along the White Mesa truck haul route, particularly for the double shift haul method.

Response:

Section 4.4.10 describes the noise increase under the White Mesa Mill disposal alternative using trucks as the mode of transportation. The night-time impact is mentioned in Section 4.4.10.5. The average noise levels and region of influence are quantified in Table 4−45.
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Document #574 Comment #82 Commentor: U.S. Environmental Protection Agency

Page 3−65, Figure 3−21 Transportation Routes and Selected Roads in the Moab to Crescent Junction Area The Final EIS should provide an estimate of traffic into Arches National Park to complete the picture of vehicle traffic in the vicinity of the site. The National Park may have suitably reliable traffic information which can be used to improve the accuracy of the traffic data and Figure 3−21 for this section of US 191. DOE may wish to verify counts, including turning movements along this section of highway, as these conditions must be considered to address the traffic conditions related to truck-haul of the tailings to either Klondike Flats or Crescent Junction sites.

Response:

The traffic impact analysis in the EIS uses segmented state data which do characterize the highway section that includes the entrance to Arches National Park. DOE will consider traffic conditions in its decision-making process.
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Document #574 Comment #83 Commentor: U.S. Environmental Protection Agency

Section 4.1.3.1.Groundwater, page 4−6, Construction and Operations Impacts at the Moab Site. This section specifically states that the "available information is insufficient to reliably estimate the inventory of soluble mineral salts in the tailings, estimate the time for the salts to be completely depleted, or predict the future geochemical transformations that may occur." However, this seems to be ignored in other sections when discussing the anticipated time frame needed for groundwater remediation in the on-site alternatives.

Response:

Based on calculations, DOE estimates that the leaching effects of an ammonia salt layer found in the upper 10 feet of the tailings pile would not be observed at the underlying water table for about 1,100 years. As discussed in the SOWP (Section 6), attenuation processes (i.e., biological degradation, sorption, etc.) make it likely that ammonia concentrations in the tailings fluid near the base of the pile would be considerably less. In addition, since the salt layer is found in the upper 10 feet of the pile, it may also be possible to mitigate the salt layer by excavation and aboveground treatment prior to placing the cap. Section 4.7.3 has been revised to include this potential mitigative measure for the salt layer. The consequence of using an erroneous value for the ground water transport or flow input parameters is described in the EIS (Tables S−1 and 2−33).
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Document #574 Comment #84 Commentor: U.S. Environmental Protection Agency

Section 4.1.4.1 Surface Water, page 4–11, Construction and Operation Impacts at the Moab Site. In the third paragraph of this section, we suggest the sentence: "Surface water concentrations should decrease as well." be deleted based upon our above concerns.

Response:

See response to comment #83 regarding the potential contribution from the ammonia salt layer. Because ground water contamination is the primary source of surface water contamination, a decrease in ground water contamination is expected to lead to a subsequent decrease in surface water contamination.

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Document #574 Comment #85 Commentor: U.S. Environmental Protection Agency

Page 4–12, Section 4.1.4.2 - Impacts from Characterization and Remediation of Vicinity Properties Because human health risks at the vicinity properties is the greatest immediate risks, we are pleased to understand that DOE will begin the remediation of the vicinity properties upon issuance of the ROD.

Response:

DOE acknowledges EPA's concurrence that the No Action alternative poses the greatest risk. DOE intends to initiate remedial actions at included vicinity properties following the Record of Decision.

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Document #574 Comment #86 Commentor: U.S. Environmental Protection Agency

Page 4−30, Section 4.1.11: DOE has responded adequately to most of EPA's comments regarding visual resources. However, EPA believes that this section should include the statement that "based on the assumption that the BLM Class II objective is not presently met at the Moab site". As stated previously (comments on the preliminary draft) the visual impacts (i.e., strong contrast) would be evident during the major construction phases associated with on-site construction. EPA would agree that strong contrasts would continue for a relatively short period of time (perhaps 3 to 10 years) after remediation was completed and until vegetation was re-established on the side slopes. EPA agrees that overall, a moderate contrast with the surrounding landscape would be expected. Re-contouring of the pile to make it a positive drainage pile may allow DOE to decrease the slopes on the north and east side of the pile and using reddish sandstone and a red-textured soil could further mitigate these visual contrast concerns.

Response:

DOE did not include a statement such as "based on the assumption that the BLM Class II objective is not presently met at the Moab site" in the EIS because the BLM Class II designation of the area surrounding the Moab site is not applicable to the Moab site itself. As stated in Section 4.1.11.5, the BLM visual classification system was used simply because it provides a useful way to measure the effects of a proposed action on visual resources. Mitigation of visual impacts is included in Section 4.7.9 and would be examined further if the on-site disposal alternative were selected.

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Document #574 Comment #87 Commentor: U.S. Environmental Protection Agency

Page 4−43 (Section 4.1.15.1): The document states that the concentration of radon at the Maximally Exposed Individual is 1.9 pCi/l. Is this an indoor or outdoor sample? If it is indoor, this is the average concentration in a home. If this is an outdoor reading, this concentration combined with seepage into the structure from the local terrain could result in the structure exceeding the 40 CFR 192.12(b)(1) 0.02 WL or 0.03 WL standards. Please specify the location of the sample in the Final EIS.

Response:

The radon concentration of 1.9 pCi/L was the average of outdoor samples taken from the second quarter of 2002 through the first quarter of 2003 at the caretaker's housing at Tex's River Tours. The measurements were made using track-etch type alpha detectors that are exposed for 3 months prior to analysis. In addition, this location is not a vicinity property to which the standard in 40 CFR 192.12(b)(1) would apply. Rather, after remediation of the Moab site, the standard in 40 CFR 192.02(b)(2), 0.5 pCi/L, would apply at this location.

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Document #574 Comment #88 Commentor: U.S. Environmental Protection Agency

Page 4−44, (Section 4.1.15.2): The section states that the EPA remediation standard for vicinity properties is 0.02 WL (or about 3 pCi/l). The actual EPA standard is that the responsible party must make a reasonable effort not to exceed an annual average of 0.02 WL, and in any case, not exceed 0.03 WL (see 40 CFR 192.12(b)(1)). Also, EPA assumes an ER of 0.5 in residential homes, which means that 0.02 WL is about 4pCi/l, and not 3 pCi/l as stated in the DOE's Draft DEIS. The way the paragraph is structured, it implies that the risks stated are EPA conclusions. The Final EIS should clarify that these numbers are not exactly consistent with EPA's risk assessments pursuant to 40 CFR 192 or these estimates of risk should be changed to the risk levels as specifically discussed in the 40 CFR 192 EIS. See the discussion on Appendix D that follows.

Response:

DOE based the impacts analysis on the 0.02 WL standard because in most cases this level of remediation could be achieved using relatively low-cost methods.

The value of 3 pCi/L was based on an equilibrium ratio of 0.7. However, the radiation risks described in the EIS are based on the WL values, not on the calculated value of 3 pCi/L, which was provided for illustrative purposes. For perspective, indoor equilibrium values typically range from 0.2 to 0.7.

The methods and data used to estimate impacts in the Moab EIS and the Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192) are generally consistent. However, as required under NEPA, in some instances more current data were used to estimate impacts in the Moab EIS, rather than using the data used to estimate impacts in the Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192).

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Document #574 Comment #89 Commentor: U.S. Environmental Protection Agency

Page 4−48, (Table 4−14): The risk assessment should include a guide and local rafter which have potentially longer exposure times than this camper-assumption procedure. See the discussion on Appendix D that follows.

Response:

Appendix D does cover these two scenarios for potential exposure to contaminated soils and ground water (at the point of release to surface water) for campers and rafters who conduct these activities on the site. The major assumptions and results for these two scenarios are presented in Tables D−6 through D−9. In both scenarios, the tables list the exposure frequency as 1 because of the uncertainty associated with this site-specific exposure assumption. As explained in these tables and elsewhere in the text, this was done to allow more flexibility in evaluating these scenarios and to address the uncertainty associated with exposure frequency. As noted in the text, the exposure frequency is proportional to the results. For example, for incidental ingestion of soil during camping, the total Hazard Quotient (also known as the hazard index or HI) for chemicals as noncarcinogens is 8.21×10^{-3} for the reasonable maximum exposure (RME) case (see Table D−6). Using the EPA screening benchmark of 1 for the HI, the exposure frequency would need to be 122 days of on-site camping to exceed this benchmark for these conditions. This would need to be done for all routes of exposure (soil and ground water) separately for noncarcinogens and carcinogens. Doing this same analysis for carcinogens using the benchmark of 1×10^{-4} to 1×10^{-6} would yield an exposure frequency of 39 to 3,900 days per year of on-site exposure. The risk driver in this type of evaluation is the RME for children ingesting contaminated ground water where the exposure frequency approaches 2 days per year of on-site camping (approximately 5 days per year for the central tendency). The evaluation in Appendix D was done in this manner to highlight the importance and uncertainty of exposure frequency in these calculations and to provide more insight to members of the public and decision-makers for evaluating risks.

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Document #574 Comment #90 Commentor: U.S. Environmental Protection Agency

Page 4−54 & 55, (Section 4.1.17): The impacts predicted by the model for cell failure due to natural phenomenon, appears to result in excessive risks and the assumptions used are not clear. For example, the document provides the volume of the tailings in tons and claims that 25% of this volume is pore water. It is not clear how to calculate the volume of pore water to understand if the model predictions remain plausible. To check the predictions, EPA staff used information obtained from the Moab Project Site Groundwater Subcommittee Minutes, July 12, 2002, which states that the pile initially contained 15 million gallons of leachate (Minutes at page 7.) Given that the assumptions used that the erosion of the pile could occur over a 10-hour period and assuming all the pore water escapes, the pore water flow rate would be 56 cubic feet cfs. The model assumed this river flow during such a failure event would be 150,000 cfs. It is not clear how mixing a 56 cfs fluid at 6.63 mg/L uranium with 150,000 cubic feet per second (cfs) river flow at background concentration of about 0.008 mg/L uranium, would result in a final mixture of 1 mg/L uranium at a 20% release or 4 mg/L at an 80% release. We understand there would be some leaching of uranium from the solids within the pile, but given the short time of this rapid event and the volume of river water that would be exposed to the tailings, this contribution would seem to be negligible compared to the pore water.

Similar inconsistencies appear to exist for the estimated concentrations shown in Tables 4−18 and 4−19. The contamination levels are a few thousand pCi/g, yet the average Ra-226 concentration is 516 pCi/g in the pile. Based on the data provide in the 40 CFR 192 EIS, uranium mill slimes have about twice the Ra-226 concentration as sands (pg 18), so it is not clear how such significantly higher Ra-226 concentrations at 3,776 pCi/g would exist.

Response:

Even though the probability of a catastrophic pile failure is highly unlikely, the purpose of this calculation was to show what could potentially occur if the tailings pile failed from a catastrophic flood to support decision-making among alternatives. This calculation was based on a series of highly uncertain assumptions. It is intended to be a screening-level calculation that depicts a reasonable worst-case scenario. Therefore, incorporating the suggestions presented would be inconsistent with the intent of the analysis.

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Document #574 Comment #91 Commentor: U.S. Environmental Protection Agency

Page 4−87, 4.2.14 Socioeconomics: This section and the section which addresses socioeconomics for the Crescent Junction site need to reflect that the economic benefits of this project are short-lived and many of the economic benefits that DOE projects, (e.g., annual expenditures and labor earnings) will occur outside the two county region extending into Carbon and Emery Counties in Utah and Mesa County in Colorado. In particular, DOE must address either in section 4.2.14 Socioeconomic analysis for Klondike and 4.3.14 Socioeconomic analysis for Crescent Junction or in Table 2−33 Consequences of Uncertainty that should the alternative selected be an off site alternative north of Moab, a significant portion of the potential socioeconomic impacts (i.e., employment multipliers) may shift to Carbon and Emery Counties and Mesa County, Colorado.

Response:

Table 2−32 and Sections 4.2.14 and 4.3.14 have been clarified to indicate the larger potential area of socioeconomic impacts identified by the commentor.
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Document #574 Comment #92 Commentor: U.S. Environmental Protection Agency

Page 7−5, (Section 7.1.11): This seems to indicate that NESHAP requirements do not apply during active remediation. The section states that 40 CFR 61 Subpart Q applies only after final disposal and that NESHAP requirements do not apply during periods of active remediation. Subpart Q regarding designation of facilities lists which facilities need to apply Subpart Q and since this is a Title I site under UMTCA, 40 CFR 61.190, this subpart does not apply. However, Subpart T of NESHAP requirements would be applicable two years after the site has become inactive (See 40 CFR 61.220 and 61.222 (b)). (The Moab Uranium Mill tailings pile has been inactive and under DOE’s authority for longer than two years.) The Subpart T rule states that such tailings piles are required to meet the 20 pCi/m_2-s Rn-222 flux standard unless a compliance agreement is reached because it is not physically possible for the owner or operator to complete disposal within the two-year time frame. DOE’s preparation of the Final EIS and the eventual ROD would satisfy the latter condition. It should also be mentioned in this paragraph that DOE is presently following the radon guidelines in DOE Order 5400.5 as described in the Moab Annual Site Environmental Report (DOE-EM/GJ677-2004).

Response:

DOE concurs with the commentor that 40 CFR 61 Subpart Q does not apply to the Moab tailings. Because the Moab tailings are regulated under Title I of UMTRCA, Section 7.1.11 has been revised to reflect that the requirements of 40 CFR 61 Subpart T would apply to the final disposal site after long-term stabilization of the final disposal site has been completed as described at 40 CFR 61.223(e). DOE acknowledges EPA’s characterization of the 40 CFR 61, Subpart Q and Subpart T regulations and agrees that the final EIS and eventual Record of Decision should satisfy both EPA and DOE requirements with respect to compliance with 40 CFR 61, Subpart T regulations.
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Document #574 Comment #93 Commentor: U.S. Environmental Protection Agency

Page A1−2 Figure A1−2 Typical Cross Section of the Disposal Cell, On-Site Disposal Alternative. The proposed figure illustrates a water storage cover and suggests a capillary break design of 6 inches. Will a 6-inch thick capillary break over the aerial extent of the pile (i.e., 130 plus acres) be sufficient? Does DOE feel confident that pile subsidence (differential settlement resulting from dewatering activities) and regional subsidence within the Moab Valley (due to salt dissolution) is likely to be evenly distributed to maintain the integrity of a 6-inch capillary break layer over the 200 to 1000-year life of the pile as required under 40 CFR 192?

Response:

Figure A1−2 is the same as Figure 2−6 in the EIS. It was placed in Appendix A1 (Biological Assessment) to minimize reference to the EIS. Section 2.1.1.3 of the EIS, which includes Figure 2−6, states that the design is conceptual for comparing impacts. During the post-Record of Decision preparation of the site-specific remedial action plan, a detailed design would be completed that would be specific for the selected alternative. The final design would address all concerns (including subsidence), would be in compliance with 40 CFR 192, and would be required to receive NRC's concurrence.

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Document #574 Comment #94 Commentor: U.S. Environmental Protection Agency

Page A1−7 Last Paragraph. DOE indicates that it would remove tamarisk trees and replace that vegetation with native riparian species that would be of "higher functional value for wildlife." In view of the USGS sediment transport modeling results, what species would be planted to provide greater bank stability? Is it likely that a native species, such as southwestern willow, can out-compete the tamarisk even after tamarisk removal? What measures will DOE take to minimize disturbance of vegetated areas at the Moab site during remediation efforts for either the on-site or off-site alternatives?

Response:

Section 2.1.1.4 and Appendix A1−4.1 state that native species would be planted, with an emphasis on species that would minimize encroachment of non-native species (e.g. tamarisk). Species composition would be determined in consultation with cooperating agencies as part of the remedial action plan. Willow is one of several species being targeted as part of the revegetation effort.

With regard to the second concern, DOE would remove all vegetation necessary to remove contaminated soils and materials. However, it is anticipated that some vegetation would remain in place. Wherever vegetation has been removed, storm water controls would be implemented to minimize the potential for runoff into the Colorado River, as stated in Section 2.1.1.1 of the EIS.

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Document #574 Comment #95 Commentor: U.S. Environmental Protection Agency

Page B−5, B4.0: DOE should consider conducting further evaluation of the proposed cover at White Mesa based on experience gained in its long-term surveillance and maintenance responsibilities for the UMTRCA Title I sites, as well as the recent design and construction of the Monticello Mill Tailings site. In the document, DOE noted that the NRC had approved the cell designs. However, NRC had previously approved the cell design at Moab and later required that the Atlas Corporation submit a revised closure plan. If a decision is made to relocate the tailings to White Mesa, specifically, what studies will DOE conduct to make certain that the proposed cover at White Mesa is acceptable? These would need to be addressed in the Final EIS.

Response:

The cover designs characterized and evaluated in the EIS are conceptual designs based on DOE's 20+ years of experience at UMTRCA sites and are considered adequate for the purpose of supporting the impact assessments of the EIS. Some examples of UMTRCA sites where DOE has completed remedial actions are three sites in Colorado (Grand Junction, Rifle, and Gunnison) and one site in Utah (Green River). The level of detail suggested by the commentor is typically not presented until after the Record of Decision in the remedial action plan, as stated in Section 2.1.1.3 of the EIS.

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Document #574 Comment #96 Commentor: U.S. Environmental Protection Agency

Appendix D, Human Health

We recommend that a revised Appendix D address a rafter guide and a frequent local rafter that may recreate on the river below the site to address potential human health risk scenarios.

Response:

See response to comment #89.
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Document #574 Comment #97 Commentor: U.S. Environmental Protection Agency

Radium in soils: When establishing the Health and Environmental Protection Standards for Uranium and Thorium Mill tailings (40 CFR 192), the primary Contaminant of Concern (COC) was identified as radon gas produced from the decay product of Ra-226. EPA's 40 CFR 192 EIS evaluated the risk for multiple alternatives including the "no action" alternative and the standards presently applicable to the Moab Uranium Mill Tailings. The results based on using the 40 CFR 192 EIS risk assessment method and that shown by DOE for the Moab tailings risk assessment are significantly different. For example, in Section D3.4 of the Appendix it is assumed that after the site has been remediated, clean surface soils are imported and there are no longer risks from either radon or gamma exposure. If the DOE were to excavate all soils down to background conditions for the primary COC, the additional risk to an on-site resident would be zero as stated in Table D−12 for an adult and stated in Table D−13 for a child. If the DOE plans to use the 5−15 Pico-Curies per gram (pCi/g) limit established in 40 CFR 192.12, then the residential risk could be 2 in 100 (40 CFR 192 EIS; Table 7−2, pg 110 alternative L2). The reason the risk exceeds the 10^{-4} risk limit is that Ra-226 is prevalent in uncontaminated soils, hence EPA established a standard near background as opposed to the conventional 10^{-6} to 10^{-4} range. To illustrate this, the 5−15 pCi/g standard is designed to bring the average concentration value below a residential structure down to 5 pCi/g. Assuming linear behavior, to reduce the risk from 2 in 100 down to 10^{-4}, the average value for radium would have to be as low as 0.025 pCi/g. But noting that the average background concentration of Ra-226 throughout the Colorado Plateau is about 2 pCi/g, establishing a risk based standard would result in a cleanup level 80 times less than background.

Response:

A section has been added to Appendix D that discusses 40 CFR 192 and the Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192). The risks from Ra-226 in soils are included in the discussion.
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Document #574 Comment #98 Commentor: U.S. Environmental Protection Agency

For the capped pile, Appendix D should note that the 20 pCi/m2-s standard is considered protective for all but the residential alternative (40 CFR 192 EIS, pg 119).

Response:

A section has been added to Appendix D that discusses 40 CFR 192 and the Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192). This aspect is included in the discussion.
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Document #574 Comment #99 Commentor: U.S. Environmental Protection Agency

The Appendix should summarize the 40 CFR 192 EIS risk conclusions and simply reference EPA's 40 CFR 192 EIS. For the no-action alternative, the appendix should use the 'rule-of-thumb' contained in the 40 CFR 192 EIS:

5pCi/g average below a structure (the 5−15 standard) = 0.02 WL in a structure equals 2 in100 risk

Response:

The methods and data used to estimate impacts in the Moab EIS and the Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192) were generally consistent. However, as required under NEPA, in some instances more current data were used to estimate impacts in the Moab EIS, rather than using the data used to estimate impacts in the Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192). Therefore, this "rule of thumb" was not used in the Moab EIS.
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Document #574 Comment #100 Commentor: U.S. Environmental Protection Agency

Contaminated surface waters: The analysis contained in this appendix only considers water ingestion in the camping scenario. Two other likely exposure scenarios should be addressed for completeness. As mentioned on page 23 of The National Academy of Science report of June 11, 2002, rafting guides are likely to have the highest exposure risk for publicly accessed areas. In addition to the guide, a local recreational frequent rafter could also receive a significantly higher exposure than a camper.

For the guide, we can assume this person:

Works 5 days per week for 5 months per year for 6 years (for example, a college student working part time); Takes two trips per day; and Swallows 1 Tablespoon (14.8 ml) of contaminated water per trip.

This would result in the consumption of 17.8 liters of contaminated water. In the camping scenario, the DOE assumed 2 liters consumed for one day resulted in a 10^{-7} risk. So using the conservative values above, a guide consuming about 10 times the water of a camper would be exposed at the 10^{-6} risk range. For a local and frequent resident rafter, we can assume one (1) trip per week for 5 months, over 30 years. Assuming the same ingestion rate, 8.9 liters would be consumed. This would be below the 10^{-6} risk range.

Response:

DOE appreciates the additional perspective on risk provided by the commentor and will consider this information in its final decision-making.
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Document #574 Comment #101 Commentor: U.S. Environmental Protection Agency

EPA understands that the current liner in Cell 4A is being removed and this cell will be reconstructed with a double liner based on commitments made by IUC to the Utah Department of Environmental Quality. What is the likelihood, now that regulatory authority has transferred from NRC to the Utah Department of Environmental Quality, that cell 4B (the proposed wet cell to handle the tailings slurried from the Moab site), and cell 5 (proposed to be the final repository for the Moab tailings) will also be required to be similarly lined? Is the DOE working with UDEQ to determine how the transfer of regulatory jurisdiction from the NRC to UDEQ might affect the design of the cell and the overall cost of a White Mesa disposal alternative?

Response:

DOE has revised text to identify the regulatory authority of the State of Utah over the White Mesa Mill. The cover designs characterized and evaluated in the EIS are conceptual designs based on DOE's 20+ years of experience at UMTRCA sites and are considered adequate for the purpose of supporting the impact assessments of the EIS. Some examples of UMTRCA sites where DOE has completed remedial actions are three sites in Colorado (Grand Junction, Rifle, and Gunnison) and one s ite in Utah (Green River). The level of detail suggested by the comment is typically not presented until after the Record of Decision in the remedial action plan, as stated in Section 2.1.1.3 of the EIS. DOE would consult further in the development of the remedial action plan if White Mesa Mill were selected in the Record of Decision.
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Document #574 Comment #102 Commentor: U.S. Environmental Protection Agency

Page H−4, H2.1 Transportation Accident Rates, Table H−2 Utah Specific Accident and Fatality Rates: DOE has utilized Utah specific accident rates taken from data provided in Saricks and Tompkins for rail and heavy combination trucks. Are the truck accident rates based on a statewide average or are they based specifically on accident rates along US 191? If a statewide accident rate for state highways was utilized, did DOE check accident rates provided or available from the Utah Department of Transportation to determine if US 191 had comparable rates? Has the DOE requested any information on locations or segments of any of the haul routes which have significantly greater accident incident rates than might be expected on such highways?

Response:

The accident rates from Saricks and Tompkins (1999) are based on Utah-specific state-wide accident rates. The estimated number of truck accidents and fatal truck accidents used in the EIS are based on the estimated number of truck miles traveled times the Utah-specific truck accident and fatality rates reported by Saricks and Tompkins. As will be shown, when this truck accident rate and fatality rate are applied to all truck traffic on US-191, the agreement with the actual number of truck accidents and fatalities on the same route segment of US-191 is excellent. The UDOT web site (www.dot.utah.gov/progdev/traffic/) provides data on the average annual daily traffic volume (AAVT) by route segment for the years up through 2002 and the truck fraction on those route segments up through 1999. The year 1999 is the last year for which a complete set of data is available. The actual number of reported truck accidents and truck-related fatalities will be based on information reported to the U.S. Department of Transportation by the State of Utah for the same segment of US-191.

Document #574 Comment #102 - response continued

To estimate the projected number of truck-related accidents and fatalities on US-191 in San Juan and Grand Counties Utah, the total truck mileage on the 157.71-mile route segment of US-191 from the Utah/Arizona state line to I-70 was estimated by multiplying the AAVT for the segment times the truck fraction for the segment, summing over all segments, and then dividing by the total length of 157.71 to get the distance-weighted AAVT for trucks. In 1999, that AAVT was 463. This AAVT was then multiplied by the total segment length and by 365 to obtain the total truck miles traveled on the 157.71-mile length of US-191 through San Juan and Grand Counties. This annual mileage was converted to kilometers and then multiplied by the truck accident rate from Saricks and Tompkins to get an estimate of 13 truck accidents in 1999. While the number of truck accidents recorded in the Motor Carrier Management Information System (MCMIS) for San Juan and Grand County in 1999 was 3, between 1993 and 1999, the number of reported truck accidents ranges from a low of 3 to a high of 13, with the average being between 7 and 8 in any given year. Thus, using the Saricks and Tompkins accident rate for US-191 provides a realistic estimate of the number of truck accidents.

Regarding the estimate of the number of fatalities associated with truck travel on US-191, using the same annual truck mileage used to estimate the number of accidents and multiplying by the Saricks and Tompkins estimate of the truck accident rate on primary roads in Utah results in less than one accident per year, about 0.7 accidents. From 1993 to 1999, five fatal truck accidents and six fatalities are reported in MCMIS for the 157.71 miles of US-191 in San Juan and Grand Counties. The actual number of fatal truck accidents is completely consistent with the Saricks and Tompkins projection.

Based on this analysis, the accident rate and the fatal accident rate used in EIS provide a reasonable prediction of the actual number of truck accidents and truck fatalities that might occur for the proposed action and all the alternatives being evaluated.
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Document #598 Comment #1 Commentor: Keeler, Bruce

As a River Outfitter who operates on the Colorado River adjacent to and below the location of the Atlas tailings I must strongly recommend that the tailings be moved away from the Colorado River flood plain. My day trip business by canoe from the boat ramp above the tailings to several destinations several miles below the pile has stopped being a viable business option since the official reports have come out. The Moab area is tourist based and keeping the tailings in place will harm our current local economy.

Response:

Concern for public and worker safety is foremost in DOE's ongoing management of the site and is paramount in its decision-making. Based on the analyses provided in the EIS (which consider both public and worker safety), consideration of the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.
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Document #598 Comment #2 Commentor: Keeler, Bruce

I also serve as the Mayor of the Town of Castle Valley located approximately 16 miles from the pile. We shop for our groceries and all necessities in Moab so our concern is very personal here also. The Town Council has voted to support a resolution promoting the moving of the pile north of Moab.

Response:

DOE has considered input from community officials and the public throughout the preparation of the EIS. This input has been instrumental in the identification of off-site disposal at Crescent Junction using rail and active ground water remediation as the Department's preferred alternatives. DOE will continue to consider such input as it finalizes its decision.
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Document #598 Comment #3 Commentor: Keeler, Bruce

There are several other points that need to be considered in the choice to relocate the tailings pile. The amounts of ammonia, radium, lead and others are too high to leave in the flood plain because no one can account for disaster related to flooding from a major regional river system.

Response:

DOE considered the flood risks associated with leaving the tailings pile in place. Although the risks from contaminants do not appear to mandate relocation of the tailings pile, potential future risks will be considered in DOE's final decision-making.
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Document #598 Comment #4 Commentor: Keeler, Bruce

We have a responsibility to the future generations to leave them with clean, safe water not water contaminated by nuclear waste. The health of the Moab Community is also tied to the moving out of their “air space”, not to mention the current and future down stream users. Health and safety should hold sway over cost, although we should try to keep the necessary costs as low as possible. This would lead to moving the pile north to Klondie Flat.

Response:

See response to comment #1.
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Document #598 Comment #5 Commentor: Keeler, Bruce

Moab has produced this waste to help with the cold war and is still willing to keep the waste locally, it just needs to be moved away from the Colorado River.

Response:

See response to comment #1.
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Document #602 Comment #1 Commentor: Paterson, Lisa

Thank you for accepting my comments on the safe removal of the Atlas tailings. The tailings are leaking ammonia and radioactive waste into the Colorado River now. It has been demonstrated that a large flood could carry a significant amount of radioactive tailings down the Colorado River thus contaminating drinking and irrigation water. Capping the tailing on site will not eliminate this possibility. Therefore, the tailings must be moved.

It is the removal of the tailings that concerns me as a citizen of Moab. To insure the safety and health of all citizens of the Moab Valley and our tourists, the removal of the tailings must be done in such a way as to produce NO DUST. Some sort of negatively pressured building must be erected in which the tailings will be scooped into whatever vessel used to carry them north to the repository. The train cars/trucks or whatever is used to transport the tailings must also be sealed so well that no radioactive tailings are allowed to escape.

It does no good to move the tailings for the safety and benefit of those downriver at the expense of Moab citizens and our tourist economy. Please! remove them without allowing radioactive dust to escape.

Thank you.

Response:

Recognizing that windblown tailings and other contaminated material may create fugitive dust emissions, the EIS states that dust control would be a component of both the on-site and off-site disposal alternatives. A dust control system would be implemented following the provisions of the Fugitive Dust Control Plan for the Moab, Utah, UMTRA Project Site (DOE 2002a), which complies with State of Utah requirements specified in the Utah Administrative Code titled “Emission Standards: Fugitive Emissions and Fugitive Dust” (UAC 2000). Water for compaction and dust control would be drawn from the Colorado River. Dust suppressants such as calcium chloride, which would be stored in tanks, may also be used. Water would be stored in tanks or in the existing water storage ponds and applied only as needed, using the most economical and efficient delivery method.

Possible air quality impacts and human health impacts of transportation under the off-site disposal alternatives are also addressed in the EIS (Chapter 4.0 of the EIS and Appendix H). Transportation of contaminated materials from the Moab site to one of the three off-site locations would result in the exposure of workers and the public to very small amounts of radiation. These exposures would not be expected to result in any latent cancer fatalities to any population.

In the final EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.
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Document #662 Comment #1 Commentor: Roberts, Harold—International Uranium (USA) Corporation

Truck Option

IUSA will not be making any comments on the Trucking Option to the White Mesa Mill. Our initial analysis of the project, and the historical opposition to trucking of the Monticello tailings to the White Mesa Mill, caused us to conclude that this option is not viable for the Moab Tailings. IUSA did not propose the Truck Option and does not support further evaluation of this option at this time.

Response:

DOE agrees that transporting the tailings to the White Mesa Mill site by truck would result in significantly more traffic impacts than transporting the tailings by pipeline.

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Document #662 Comment #2 Commentor: Roberts, Harold

Cultural Resources and Traditional Cultural Properties

Potential impacts to cultural resources for all options are referenced in numerous places in the EIS, with DOE stating that the greatest impacts will be from the White Mesa slurry pipeline option. The EIS indicated that up to 121 eligible sites could be impacted from the White Mesa slurry pipeline option. The majority of these sites are projected to be along the pipeline route. DOE acknowledges that no field surveys were conducted along the proposed pipeline route and that the number of cultural sites is based on an estimated average density of sites in the project area. DOE's proposed route description confirms that the majority of the pipeline route will be within or adjacent to existing pipeline rights-of-way, highway rights-of-way, or through areas previously disturbed by agricultural activity. These areas will have already been cleared of cultural sites or in the case of agricultural land, the cultural sites will most likely have been disturbed by the agricultural activity. In addition, DOE's analysis does not take in to account the flexibility of pipeline construction to avoid cultural sites through adjustments in routing. For these reasons, IUSA believes that the potential impact to cultural resources along the pipeline route is grossly overstated in the EIS. Even though the distance to the White Mesa Mill is further than the other pipeline routes, IUSA believes impacts to cultural resources will be no greater than the other alternatives. DOE must take into account the ability to avoid cultural resources through the flexibility of pipeline routing that is not available for highway and railroad construction.

Response:

Sizable portions of the proposed pipeline routes, both from the Moab site to the White Mesa Mill site and from the Moab site to the Crescent Junction site, are located along existing pipeline and highway rights-of-way. However, the cultural sites that could be adversely affected by DOE's proposed pipelines are located within these rights-of-way; the rights-of-way corridors have not been "cleared of cultural sites." The cultural sites remaining in these rights-of-way were avoided during construction of the existing pipelines and highways. They may not be avoidable if new pipelines were constructed.

Document #662 Comment #2 - response continued

DOE tried to take into account the flexibility of pipeline construction in its cultural resource analysis, as adjustments in routing can be made to avoid cultural sites. For the White Mesa Mill pipeline, an estimated 194 to 404 cultural sites eligible for inclusion in the National Register of Historic Places occur within 0.5 mile of the proposed pipeline. Because of the large uncertainty in the number of sites and uncertainty in the exact location of the pipeline (because of flexibility in construction), DOE assumed that only 25 percent of these sites might be adversely affected. For the Klondike Flats pipeline, a total of 25 eligible sites occur within 0.5 mile of the proposed pipeline. Because of the high certainty in the number of sites but uncertainty in the exact location of the pipeline, DOE assumed that 25 to 80 percent of the sites might be adversely affected. For the Crescent Junction pipeline, a total of 45 eligible sites occur within 0.5 mile of the proposed pipeline. Because of the “medium” uncertainty in the number of sites and uncertainty in the exact location of the pipeline, DOE assumed that 25 to 50 percent of the sites might be adversely affected. DOE believes that this analysis is reasonable. The proposed pipeline route to the White Mesa Mill contains 8 to 16 times more cultural sites than the pipeline route to Klondike Flats and 4 to 8 times more cultural sites than the pipeline route to Crescent Junction. The potential for cultural resource impacts are greater for the White Mesa Mill pipeline than for the other off-site disposal locations.

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Document #662 Comment #3 Commentor: Roberts, Harold

The cultural sites that exist on the White Mesa Mill site have been well documented, and the potential impact to those sites was included in the original Environmental Statement, and subsequent Environmental Assessments, supporting the construction and licensing of the facility. The previous operator of the White Mesa Mill (Energy Fuels Nuclear, Inc.) took great care in preserving and protecting existing sites on the property and altered construction plans when possible to avoid sites.

All of the sites which may be impacted by the construction necessary to accept the Moab tailings were also included in the original site evaluation. Therefore, the DOE should not consider these in the evaluation of the White Mesa site unless they are outside of the already licensed area. The DOE EIS should only consider incremental impacts to the White Mesa Mill site, which will be minimal.

Response:

In accordance with NEPA regulations, DOE is required, and has the responsibility, to describe the nature of impacts associated with its proposed actions. The fact that some of the cultural sites on the White Mesa Mill were documented and assessed in the site’s original environmental impact statement and subsequent environmental assessments does not preclude DOE from analyzing these same sites if they may be affected by DOE’s proposed actions.

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Document #662 Comment #4 Commentor: Roberts, Harold

While it is possible that some existing sites will be disturbed as a part of future construction on the White Mesa Mill site, excavation or mitigation of cultural resource sites is not without recent precedent. The State of Utah provided IUSA a list of authorized archaeological projects in San Juan County. The list includes all known projects since the State began keeping records through to the year 2002. The list includes not only the excavations on White Mesa, but also several listings for highway improvement projects on Highway 191, State Road 95 and Comb Ridge, Recapture Dam pipeline project, City of Blanding 4th Reservoir Project, the DOE's Monticello project, mitigation efforts for Union Oil, several excavations at national parks and recreation areas, reference to several burials, as well as references to excavations conducted by the Edge of the Cedars Museum, and State of Utah agencies and universities.. The recent examples of archaeological excavations in conjunction with other projects should be acknowledged by DOE as a common occurrence in San Juan County and activities at the White Mesa Mill site are not unique in any regard. DOE statements in the EIS lead the reader to conclude that the potential to impact cultural resource sites will make the White Mesa pipeline option impossible to permit.

Response:

The uniqueness of the particular cultural sites that would be adversely affected by DOE's proposed actions can only be determined through the Section 106 consultation process. Given the density and variety of potential traditional cultural properties on the White Mesa Mill site, the importance attached to them by tribal members, and the number of tribal entities that would be involved in consultations, mitigation of these cultural resources would be difficult. DOE does not state that permitting would be impossible.

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Document #662 Comment #5 Commentor: Roberts, Harold

While IUSA is respectful of Native American history and beliefs, the lack of protest by the local Native American community on destruction of cultural sites on other recent projects, including the up-grades to Highway 191 through the White Mesa community leads IUSA to believe that the protests regarding the potential impact to cultural sites, as a part of the Moab tailings project, is a reflection of broader objection, by a small segment of the Native American community and its non-Native American supporters, to the operations of the White Mesa Mill. The lack of similar objection on recent projects by the local Native American community should be noted in the EIS and DOE must defend why the impacts to cultural resources are so unique to the White Mesa Mill.

Response:

Cultural resources and traditional cultural properties vary by location. DOE is responsible for analyzing the impacts to cultural resources and traditional cultural properties that would be affected by its proposed actions. The uniqueness of the sites that would be adversely affected by DOE's proposed actions can only be determined through the Section 106 consultation process. The lack of Native American objection to other recent projects (such as highway upgrades through the White Mesa community) is not relevant to this EIS.

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Document #662 Comment #6 Commentor: Roberts, Harold

The State of Utah has historically been in support of the archaeological projects on the White Mesa Mill site. In a letter written to the NRC in the early 1980's, J. Phillip Keene, Executive Director and Utah State Historic Preservation Officer stated that the work on the White Mesa Mill site "undertaken by the State Archaeologist was at the insistence of and with the complete cooperation of Energy Fuels." The letter further states that, with respect to the recovery of archaeological information, "the significance of these sites lies not with their becoming public attractions or monuments, but rather with the information they have yielded about certain prehistoric cultures. Sites of this nature are plentiful throughout the southeastern part of Utah, but have not been tested. It is only the opportunity presented by the desire of Energy Fuels to build a uranium mill in this area that permitted us to devote the time and energy to a thorough study of such sites." Mr. Keene concludes that "there is no doubt in my mind that the proposed project should go forward and that in doing so will recover significant scientific data which could not be recovered if the project didn't proceed."

During this same time period David Madsen (the Utah State Archaeologist) is on record, in a response to a question concerning whether the sites were worth preserving, as stating "that these sites are not unique and that sites of this nature are plentiful throughout southeastern Utah." He supported this by stating that there are 25,000 recorded sites in Utah and 8,000 of these are in San Juan County. "In fact, he added, because of the heavy prehistoric population in this region, it is virtually impossible to find an area that was not similar."

This supporting documentation has previously been provided to DOE by IUSA. IUSA believes that DOE should fairly assess the potential impacts to cultural resources posed by the White Mesa slurry pipeline option, and justify it's conclusion that any such impacts are unique, unacceptable and pose unusual issues for the Native American community.

Response:

See responses to comments #2, #4, and #5.
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Document #662 Comment #7 Commentor: Roberts, Harold

Project Costs

The lack of cost detail provided in the EIS makes it impossible to reasonably evaluate the alternatives. The EIS cost estimate for the slurry pipeline option to White Mesa is more than double the estimated costs provided to the DOE by IUSA for the construction and operation of the slurry pipeline, the slurry preparation plant and the disposal cell at the White Mesa site. Without additional cost information it is difficult to evaluate whether the White Mesa option has been fairly evaluated.

Response:

The EIS presents costs for each alternative using similar labor, schedule, and material cost assumptions to ensure that the absolute and relative costs are comparable. In addition, Section 2.7.3 identifies that the costs include a 10-percent contingency and are expected to fall within the range of –15 percent and +30 percent of the estimates presented. Therefore, the costs as presented (with qualifications) are sufficient to support decision-making and to distinguish among the alternatives.
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Document #662 Comment #8 Commentor: Roberts, Harold

Water Requirements

The EIS estimates that over 400 gallons per minute of makeup water will be required for the slurry pipeline option. This appears to be significantly higher than previous estimates done by IUSA, especially considering that:

- the majority of the existing tailings material is most likely higher in moisture content than the projected optimum moisture for final disposal; and,
- the majority of the water used for slurry transport will be re-cycled back to the Moab site for re-use in the slurry operations.

The EIS is incorrect in the statement that the White Mesa slurry pipeline option will require the same amount of Colorado River water as the other off site pipeline options (see Figure 2−46). In fact, selection of the White Mesa slurry option reduces the demands on the Colorado River relative to the other options. The majority of the water required for the White Mesa option will come from existing sources controlled by IUSA on the Mill site or from IUSA's water rights from Recapture Reservoir. The benefits of reducing the water demands on the Colorado River by selection of the White Mesa slurry pipeline option needs to be clearly stated in the EIS.

Response:

DOE believes that its estimate of make-up water requirements are reasonable and conservative. Section 2.2.4.3 of the EIS states that for the slurry pipeline alternative, 400 gpm of make-up water would be required at the Moab site, either from the Colorado River or, if available, from the off-site disposal location. The section further estimates the availability of this supply at the White Mesa Mill site. This availability is based on the assumption that existing IUC wells and water rights to Recapture Reservoir could supply this make-up water demand. However, Figure 2−46 assumes a worst-case scenario for withdrawals of Colorado River water; for example, if any unforeseen circumstance should disrupt the supply of makeup water from the White Mesa Mill site. In that case, the impact on Colorado River withdrawals would be about the same for all three off-site locations.
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Document #662 Comment #9 Commentor: Roberts, Harold

Furthermore, IUSA believes that the need for large quantities of water for construction of the disposal cells and dust control at the disposal site has not been addressed. The White Mesa Mill has an adequate supply of water for all needs. The source, cost, potential difficulty in obtaining this water, and the cumulative impacts to local water sources have not been addressed for disposal of tailings at the other two off-site locations.

Response:

The estimates for nonpotable water requirements for construction of a reference disposal cell reflect DOE's experience in estimating resource needs for other UMTRCA sites. Table 2−24 in the EIS presents the estimated nonpotable water consumption for the three transportation modes for all three off-site disposal locations. It is assumed that DOE's Colorado River water rights would supply nonpotable water for the Klondike Flats and Crescent Junction off-site disposal alternatives and, if necessary, could do so for the White Mesa Mill off-site disposal alternative.
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Document #662 Comment #10 Commentor: Roberts, Harold

Schedule

The schedule presented for the two other off-site locations appears to be overly aggressive given the need to fully develop the infrastructure at these locations and to complete the necessary studies and permitting efforts to begin construction. DOE needs to justify why the normal permitting process will not be necessary for these sites. If DOE considers these schedules accurate, the licensing requirements for the White Mesa Mill site will be shorter than the greenfield Klondike Flats and Crescent Junction sites because the site is already licensed to dispose of uranium mill tailings.

Response:

The normal permitting process would be necessary for all sites. DOE considers these schedules to be sufficiently accurate and comparable to support decision-making and to distinguish among the alternatives. However, it is not appropriate to assume that because the White Mesa Mill site is already licensed to dispose of uranium mill tailings, the time frame to complete licensing requirements for that site would be shorter than the time frame for the Klondike Flats and Crescent Junction sites. The White Mesa Mill site disposal alternative includes potential issues with the State of Utah regarding amending IUC's license. The assumption of comparable permitting time frames for all alternatives is reasonable.
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Document #662 Comment #11 Commentor: Roberts, Harold

DOE also needs to more fully evaluate the effects on the schedule for the trucking options during the summer months when tourist traffic is at its peak.

Response:

Traffic rates used segmented state data which do characterize the highway sections over an entire year. This information was considered along with the other analyses in the EIS in the identification of rail as the preferred transportation mode for tailings.
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Document #662 Comment #12 Commentor: Roberts, Harold

Tailings Conditioning

DOE has acknowledged the need to dry the majority of the tailings material prior to transport to the off-site locations by the truck or train option. The time required to dry the material may be correct for the summer months of the year, but 3 to 7 days seems overly optimistic for the late fall, winter and early spring months. A single thunderstorm could cause a significant reduction in production rates from the site. DOE needs to include contingencies in the project schedule for the truck and rail options for difficulties in getting the tailings material dry enough for transport and placement.

Response:

The time required to dry the material reflects an average period for all seasons and material types (sand and slimes). Though specific climatic conditions may cause short-term variances in schedule, the appropriate stockpiling and management of tailings should ensure that no long-term schedule variances are incurred. Therefore, no schedule contingency has been included for any of the off-site alternatives.
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Document #662 Comment #13 Commentor: Roberts, Harold

IUSA is also concerned that the DOE has not properly accounted for the reduction in potential radon emanation for the slurry pipeline option as a result of the elimination of the 50 acres of drying areas at the Moab site, which are not required.

Response:

Section 4.4.15.1 characterizes the radon exposures of the slurry pipeline alternative without the drying beds at Moab.
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Document #662 Comment #14 Commentor: Roberts, Harold

Project Benefits

A potential benefit of the White Mesa slurry pipeline option that was mentioned, but only briefly, is the ability of the White Mesa Mill to process the recycle water to recover uranium. At the present time uranium prices have increased to over $20.00 per pound, which are at levels not seen in over twenty years. The United States currently consumes approximately 60.0 million pounds of uranium annually and produces only 2.0 million pounds. As a result, the country is very reliant on external sources to provide fuel for its commercial nuclear reactors that provide nearly 20% of the country's electrical power. Although it is difficult to accurately determine the potential amount of uranium which could be recovered from the tailings, the ability to pursue this with the White Mesa option needs to be discussed in further detail and should be a potential issue for consideration in the relocation of the pile.

Response:

As noted in the comment, reprocessing of the Moab tailings is technically uncertain, and the potential amount of uranium and other material that would be recoverable is unknown. Therefore, the profit available to IUC is unknown, and the potential to offset some of the costs of this alternative cannot be quantified. Also, such an action at IUC would have to be evaluated explicitly under an EA or EIS and meet the approval of the State of Utah. For these reasons, recovery of uranium from the slurry operation is not explored in this EIS.
==

Document #662 Comment #15 Commentor: Roberts, Harold

Page 1−12 DOE has been repeatedly asked during public meetings to include the potential of re-use of the slurry pipeline in the evaluation of the off site alternatives. The EIS mentions the potential long term use of the slurry pipeline system after the completion of the project however it discounts the need to do the study and potential impact of the infrastructure due to the perceived speculative nature of the use of the pipeline system. Preliminary engineering indicates that the contamination concerns raised by DOE are speculative, and that with minimal additional engineering, this perceived issue could be eliminated.

The long-term socioeconomic benefit of the pipeline infrastructure for San Juan County is significant and should not be discounted. The ability to turn short-term expenditure for the relocation of the tailings pile into a long-term economic benefit for one of the most depressed counties in the United States should not be eliminated with little to no analysis. San Juan County is very reliant on the agricultural industry, which over the past several years has been nearly decimated due to the lack of water in the area. The ability to provide another more stable source of water for irrigation, beyond a normal reliance on surface run-off and collection, would result in a significant increase in the number of irrigable acres and overall productivity of the agricultural industry in the area.

Water rights from the San Juan River currently go un-used and could be transferred to the Colorado River because of the common collection point at Lake Powell. Use of these water rights in the areas surrounding the communities of Blanding and White Mesa could dramatically affect the economies and well being of the area residents. DOE should include this potential benefit in the evaluation of the slurry pipeline option to White Mesa.

Response:

As described in Section 1.4.5, it is DOE's position that the potential post-remediation use of a slurry pipeline to White Mesa for agricultural water use is beyond the scope of this EIS.
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Document #662 Comment #16 Commentor: Roberts, Harold

Page 2−29 DOE should evaluate the pipeline diameter based on an engineering analysis of the construction and operating costs of the pipeline. Selecting the pipe size based on matching an alternative schedule may not yield the most cost effective option.

Response:

If DOE decided to transport the tailings by slurry pipeline, many factors would be considered to determine the pipeline diameter size. For the EIS analysis, assumptions were made regarding the size of the pipe to permit completion of slurry transport on a schedule comparable to that of truck and rail to facilitate comparisons among the alternative transportation modes.
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Document #662 Comment #17 Commentor: Roberts, Harold

Page 2−56 The addition of electrical substation upgrades at the White Mesa Mill site will not be necessary unless the Mill is also processing uranium ore in the conventional Mill circuit.

Response:

The text has been revised to clarify that these upgrades are required for the slurry system only if the mill is also processing uranium ore in the conventional mill circuit.
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Document #662 Comment #18 Commentor: Roberts, Harold

Page 2−62 IUSA's pipeline consultant did not specify the need for aerial crossings along any of the pipeline route. Exposing the pipeline at any point along the route may be un-advisable due to the issues of vandalism and mechanical damage acknowledged by DOE.

Response:

In independently reviewing the route to the White Mesa Mill site, DOE determined that some canyons and washes may be most affordably crossed via elevated pipeline rather than incurring the extra distances required to go around such terrain. This assumption was used to bound the EIS analyses. If off-site disposal were selected, final corridor-specific design would not be generated until after a disposal site and transportation mode were selected. DOE agrees that exposing the pipeline could result in vandalism and higher maintenance costs and would take this factor into consideration in final route selection.
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Document #662 Comment #19 Commentor: Roberts, Harold

Page 2−88 Table 2−21 is misleading. DOE should separate the equipment required for construction from that required for operation and present the information in two tables.

Response:

Table 2−21 identifies in separate columns the equipment needs for construction and operations by location and alternative.
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Document #662 Comment #20 Commentor: Roberts, Harold

Page 2−118 The reference to “minor geologic instabilities” on the White Mesa site is misleading. This statement could lead the reader to believe that the final disposal cell could fail when in fact the only issue is the potential for erosion or sloughing of the canyon walls to the west of the site. DOE needs to clarify the basis for this statement or remove it from the text.

Response:

As stated in the EIS, minor geologic hazards are a problem only at the edges of and on the slopes of White Mesa where montmorillonite in the Brushy Basin Member is present (see Section 3.4.1.4). DOE did not state that the existence of minor geologic instabilities could result in disposal cell failure.
==

Document #662 Comment #21 Commentor: Roberts, Harold

Under the Air Quality discussion, DOE needs to clarify that the potential for greater emissions on the White Mesa option is for the truck option only.

Response:

Section 4.4.2 has been revised to provide the suggested clarification.
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Document #662 Comment #22 Commentor: Roberts, Harold

Page 2−120 The reference to wetlands on the White Mesa site is misleading. The only areas qualifying as a wetland are the wildlife diversion ponds on the east edge of the property. These areas would not be affected by the Moab project.

Response:

Section 3.4.8 of the EIS and Appendix F3.4 acknowledge that the wetlands at the White Mesa Mill site have not been assessed in detail. Section 4.4.5.2 also acknowledges that potential impacts to wetlands are unknown because a detailed assessment has not been done. The general statement on page 2−120 is relative to the comparison of alternatives.
==

Document #662 Comment #23 Commentor: Roberts, Harold

Page 1−122 Figure 2−47 is inaccurate in that it indicates a large area of new disturbance for the disposal cell on the White Mesa site. The original Environmental Statement for the White Mesa Mill evaluated the potential disturbance of all but 30 acres of the area projected to store the Moab tailings. This figure should be revised to indicate only the additional disturbance caused by the Moab tailings.

Response:

The figure represents the total area that would be affected under the White Mesa Mill alternative. Prior assessment in other NEPA documents does not relieve DOE of the responsibility to describe the impacts of its actions.
==

Document #662 Comment #24 Commentor: Roberts, Harold

Page 2−125 The visual impacts from the slurry pipeline are overstated. The majority of the pipeline route visible from Highway 191 will be adjacent to or within existing pipeline rights-of-way that have been previously disturbed. The southern part of the pipeline route is either well away from the highway or crosses agricultural land. This text needs to be changed to accurately reflect the minimal visual impact for the White Mesa slurry pipeline option.

Response:

The text on page 2−125 summarizes the visual resource analysis described in detail in Section 4.4.11.3. The summary is correct in that pipeline construction would have more adverse impacts to visual resources than any other action described for the White Mesa Mill alternative, although impacts are mostly negligible overall. The summary is also correct in that moderate contrasts would be created in the landscape by the pipeline scars. Along most of the pipeline, however, these moderate contrasts meet BLM's Class III visual resource objectives.
==

Document #662 Comment #25 Commentor: Roberts, Harold

Page 2−135 In Figure 2−61 the DOE indicates a rate of fatalities from pollution health affects for the White Mesa Slurry pipeline option. This is the only option which indicates the potential risk from pollution health effects and there is no mention or discussion of this risk in the text. The rate should be no different than the rates for other pipeline options.

Response:

The nonradiological pollution fatalities for the bar labeled “White Mesa slurry pipeline” has been revised to denote these as traffic fatalities. The nonradiological pollution fatalities are different for each pipeline option, primarily because the distances over which borrow materials are transported to the disposal site are different for each slurry pipeline option. Nonradiological pollution fatalities are discussed in Appendix H.1.1, and the impacts are presented in Sections 4.1.15.3, 4.2.15.2, 4.3.15.2, and 4.4.15.2.
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Document #663 Comment #1 Commentor: Goddard, Terry—Office of the Attorney General

The Colorado River is a vitally important resource for Arizona, and its long-term health matters enormously to the people of this State. In general, I concur with Governor Schwarzenegger of California, Governor Guinn of Nevada, Governor Richardson of New Mexico and our own Governor Napolitano that the Moab Uranium Mill Tailings pile should be removed from the bank of the Colorado River, rather than stabilized in place, to ensure the protection of human health and the environment of downstream users. I am concerned that despite your Agency's best efforts, if the pile is left in place, natural subsidence of the pile and future flood events may result in future releases of contamination to groundwater and the Colorado River. note that part of the Moab tailings impoundment currently sits in the floodplain of the Colorado River and that during a 100-year flood event, the estimated water level would be three to four feet above the base of the tailings pile. I also share Utah's concern that by leaving the tailings in place, the remediation goal for ammonia discharges to the Colorado will never be achieved. Prolonged, elevated concentrations of ammonia could have a severe adverse impact on the health and safety of the residents of Arizona and Utah living along the Colorado River. It could also cause great harm to aquatic life and their habitat and adjacent wetlands.

Response:

The EIS addresses the impacts associated with natural subsidence of the basin and future floods in Section 4.1.17. In addition, the EIS discusses the uncertainties regarding the on-site disposal alternatives in Section 2.6, including the issues of subsidence and flooding, and identifies the impacts should the Department's assessment prove incorrect. The consequences of the 100-year flood and water levels 3 to 4 feet above the base of the tailings pile are quantified in Section 4.1.3.1. A more detailed discussion can be found in the SOWP (DOE 2003a). The analysis was based on site-specific characterization of the tailings source term and the calibrated flow and transport model under the presumption that the tailings remain a perpetual source of contaminant loading to the ground water system along with additional conservative assumptions.
It should be noted that current ground water discharge to the river, which is more than 100 times larger than the predicted long-term discharge, does not create a measurable change in river water quality just a few thousand feet downstream from the site. Therefore, the EIS anticipates that the remediation goal for ammonia discharges to the Colorado River would be achieved. DOE is confident that under either the on-site or the off-site alternative, there would not be severe adverse impacts on the health and safety of the residents of Arizona and Utah living along the river or great harm to aquatic life, their habitat, and adjacent wetlands.
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Document #663 Comment #2 Commentor: Goddard, Terry

I have also examined the three off-site remedial alternatives. While all of these alternatives are superior to the on-site alternative, I find the off-site disposal of the uranium tailings at the White Mesa Mill Site the least desirable. Disposal of the uranium mill tailings at either the Klondike Flats or Crescent Junction is preferable because of their proximity to the Moab site, their proximity to existing rail lines and their proximity to off-site borrow areas that can be used for clean backfill and capping purposes. Further, I am concerned that disposal of the uranium tailings at the potential White Mesa Mill disposal site will result in substantially increased truck traffic, with a concomitant increase in the risk of traffic accidents along the US-191 corridor, and in a disturbance of the cultural and historical resources of the Ute Tribe.

Response:

DOE acknowledges the commentor's support for disposal of the uranium mill tailings at either the Klondike Flats or Crescent Junction site because of their proximity to the Moab site, to existing rail lines, and to off-site borrow areas. Traffic impacts associated with transporting the tailings to the White Mesa Mill site by truck are identified in Section 4.4.16. Impacts on cultural resources and traditional cultural properties associated with construction activities at the White Mesa Mill site are identified in Section 4.4.9.

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Document #669 Comment #1 Commentor: Kamala, Laura

The Atlas Mill Tailings must be removed from the banks of the Colorado River and moved to a safe contained area well away from the river.

I have been a resident of Grand County for 28 years. I've seen the Colorado River lapping up against the Atlas uranium mill tailings pile in the high water years of '83 and '84. The best available science says that 12 million tons of radioactive waste will wash downstream if left in place, it is just a matter of time. A National Academy of Science report confirms this as well as the USGS. You are well aware of the scientific facts.

Response:

As characterized in Section 2.1.1.3 under the on-site disposal alternative, DOE would use an engineered barrier wall to further reduce the chance of unlikely migration of the Colorado River into the pile and would place riprap on the sides of the pile to deflect the erosional forces of expected floodwaters. The recent USGS report would be used by DOE to size riprap such that floodwater velocities would not be sufficient to degrade these mitigative measures. The EIS acknowledges that the floodwaters of 1984 rose 4 feet up the side of the pile and, in the conservative analyses in Section 4.1.3.1, determined that post-flood releases would not likely exceed aquatic standards in the river. DOE does not believe that pile failure into the river is likely within the regulatory period of 200 to 1,000 years but does agree that, assuming failure of long-term management and maintenance, such an event is possible. The EIS discusses the consequences of catastrophic failure in Section 4.1.17.

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Document #669 Comment #2 Commentor: Kamala, Laura

I stood with Congressman Matheson last October on the riverbank next to the tailings pile and took water samples that dramatically illustrated the rapid outflow of a toxic brew of chemical waste into the current of the river. After all, 57,000 gallons per day of this toxic plume have been pouring into the river for the past 40 years.

Response:

DOE agrees that leaching of contaminants from the tailings pile has affected ground water that discharges to the Colorado River adjacent to the site and that the river is a drinking water supply for millions of people. For this reason, DOE has already undertaken interim actions at the Moab site that must be done irrespective of the decisions made pursuant to the NEPA process to reduce contaminant migration. These actions include capturing and evaporating some of the most contaminated ground water from the legacy plume that is entering the Colorado River and reducing the contaminant seepage from the pile area that has the potential to migrate into ground water beneath the pile. These interim actions have proven to be very effective in significantly reducing the total mass of contaminants reaching the river.

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Document #669 Comment #3 Commentor: Kamala, Laura

The existence of an alternative in the DEIS that considers capping the tailings pile in place is a blatant disregard of the health and welfare of 26 million downstream water users and demonstrates an utter lack of responsibility for the economic disaster that will occur when the Colorado River washes the tailings downstream. Such a scenario should be included in an analysis of the real costs of capping the pile in place.

Response:

As stated in Section 4.1.17, which identifies the impacts associated with the highly unlikely event of catastrophic disposal cell failure and release into the river, a major tailings release is not anticipated to significantly increase risks to human populations downstream of Lake Powell, and the water quality impacts would be short-term. Given the engineering controls for the on-site disposal alternative and the velocities of the worst-case floodwaters, the likelihood of catastrophic failure and the need for remediation are so remote that detailed quantification of these cost impacts is not included in the scope of the EIS.
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Document #669 Comment #4 Commentor: Kamala, Laura

Residents of Moab are threatened with contamination of their culinary aquifer by the toxic plume emanating from the tailings pile. For many years I watched as high Spring winds sent thick clouds of toxic tailings dust airborne, to settle over the residents of the Moab valley. This community has suffered enough from the long range effects of uranium mining and milling and waste storage.

Response:

DOE would survey and radiologically characterize properties in the Moab area to determine if they contain residual radioactive material. If the residual radioactive material exceeded EPA standards, the properties would be targeted for remediation.
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Document #669 Comment #5 Commentor: Kamala, Laura

The Department of Energy should choose an alternative that removes the mill tailings from the banks of the Colorado River. I vote for the Klondike Bluffs site.

Response:

The commentor’s preference for relocating the tailings pile to the Klondike Flats site is noted.
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Document #672 Comment #1 Commentor: Peschong, Jon

Section 102 [42 USC 4332] (C) (ii) requires the responsible government official to provide a detailed statement on any adverse environmental effects which cannot be avoided should the proposal be implemented. With the proposed two alternatives, unavoidable impacts are either those impacts resulting from leaving the waste in place (Alternative 1) or impacts resulting from disposal cell construction activities (all three locations analyzed in Alternative 2). The EIS should consider a third alternative - rail and truck transportation of the waste to an existing, licensed disposal cell. This third alternative would not incur the impacts from leaving the waste in place, nor the impacts from disposal cell construction activities. When this alternative is analyzed in the EIS, the existing, licensed disposal cell should be chosen appropriately distant from Moab so as to bound transportation environmental impacts.

Response:

The White Mesa Mill off-site disposal alternative would involve the disposal of the Moab uranium mill tailings in an existing commercial disposal facility located approximately 85 miles south of Moab, Utah. This alternative is analyzed in detail in the EIS.
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Document #673 Comment #1 Commentor: Clark, Monette

I am a resident of San Juan County, Utah, living in the upper end of the Moab Valley, just across the Grand County line. I am writing to make a comment on the Draft Environmental Impact Statement (EIS) issued by the DOE for the Moab, Utah UMTRA Project Site. I am in favor of moving the uranium tailings pile away from the banks of the Colorado River and relocating the contaminated soil, by rail, to the Crescent Junction site within Grand County.

Response:

Comment noted.
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Document #673 Comment #2 Commentor: Clark, Monette

I believe it is imperative that the tailings be moved off the river bank because it is a big health and safety risk, both for residents of the Moab Valley and for the huge population living downstream of the Colorado River. Several years ago, a study showed that the tailings pile is already contaminating the nearby river water with ammonia that is strong enough to kill the fish. Another recent study has found that contaminants are leaching into the ground water across the river, in the Matheson Wetlands Preserve! This is scary and is bound to get worse the longer the pile remains where it is. It is only a matter of time before the Moab Valley ground water becomes polluted and the people of Moab will have unsafe drinking water coming out of the wells that supply us.

Response:

Regardless of whether, in the Record of Decision, DOE ultimately decided to relocate the tailings pile or cap it in place, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements in 40 CFR 192.

DOE’s position is that contamination is not migrating under the river and affecting the Matheson Wetlands Preserve. However, there are responsible opposing views on the fate and transport of site-derived contaminants in ground water. Both views on the question of contaminant migration under the river are based on differing interpretations of technical data. A new section on these opposing views (Section 2.6.4) has been added to the final EIS.
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Document #673 Comment #3 Commentor: Clark, Monette

The tailings pile has been there all my life. I grew up in Moab during the 50s and 60s, when the uranium mill was actively processing uranium. The yellowcake and dust from the tailings pond and mill site was blowing all over the valley when I was a kid. I have been exposed to enough radioactivity already.

Response:

DOE will consider this comment in its final decision-making.
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Document #673 Comment #4 Commentor: Clark, Monette

The conclusions in the EIS about the river moving southward and the valley floor subsiding have been challenged by other studies and other scientists. I ask you to consider the following items:

- Grand County and governors and representatives across the region are unanimous in their position that pile should be moved to a safe, contained area within the county.

- The National Academy of Science says that it is a near certainty that the river's course will run over the Moab uranium mill site at some time. A major flood or storm event will cause radioactive waste and other chemicals to wash into the Colorado River. The fact that a 100 or 500 year flood has not occurred in recent history is not a good enough reason to suppose that such an event will not occur in the future. In the scheme of geologic and meteorological history, recent history means nothing. To confine ourselves to the limited purview of recent history is both dangerous and irresponsible. We have the opportunity and responsibility to protect future generations and millions of people in the lower Colorado River Basin.

Response:

The NAS report to the Department, dated June 11, 2002, stated, "While one cannot predict the timing of river migration (over the coming millennia or in the next several decades), the committee sees it as a near certainty that the river's course will run across the Moab site at some time in the future, unless engineered barriers prevent it from doing so." DOE agrees with the NAS conclusion that at some point in the future, especially considering geologic time, the river will cross the Moab site. DOE believes that engineering controls could be used to resolve this issue for the near term (200 to 1,000 years). As part of the analysis for the on-site disposal alternative documented in the EIS, the need for engineered barriers to control river migration is defined.

Section 4.1.3.1 acknowledges the potential for flooding of the tailings pile if the tailings were capped in place and quantifies the impacts that could result from such inundation. These impacts would include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in Section 2.1.4, an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment.These measures would further reduce the already low probability of a catastrophic failure of an on-site disposal cell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if this alternative were selected.
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Document #673 Comment #5 Commentor: Clark, Monette

Moving the Moab Uranium Tailings Pile is a justice owed to the Moab community. The government started the Uranium Boom and created the market for it. Moab people, including my relatives, produced the radioactive material for America's defense. And everybody in America benefited by being "protected." Many of the mill workers are now dead of cancer. Fifty-plus years later, the government should be responsible enough to defend the local people that are left (and all the new people moving in here due to our new tourist economy) against the very real terror of radioactive pollutants on the riverbank! The cost of moving the pile should be shared by the nation that shared in the "benefits" of nuclear defense. Please move the tailings pile NOW.

Response:

Comment noted.
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Document #684 Comment #1 Commentor: Weber, Ivan

Of those raised to date, the single one of greatest concern amounts to a strenuous objection to leaving in place and capping of the tailings. The reasons that I will cite for this objection, and for the corollary favor for tailings pile relocation, are these:

- River undercutting: River morphology will undermine the site, repeatedly and emphatically, not only through extreme high water event dynamics, but also through the more frequent annual high water scouring. It is extremely important to register objection to the DOE hydrological model for river cutting, which apparently failed to incorporate suspended sediment effects. With increased velocity that occurs in high water events, suspended particle size also increases. One would see that very large rocks are among suspended sediments being tumbled and swirled along the bottom/outside of a river bend, such as that occupied by the Atlas Tailings. The DEIS's arguments that the river will cut downward in the channel's center defy common sense, not to mention the accumulated body of knowledge on river morphology. Study of channel migration mechanics need stray no more than a few miles from the Atlas site to find many examples to belie the DEIS model, and show that the site is in a great deal more jeopardy than DOE postulates.

Response:

The EIS acknowledges the potential for flooding of the tailings pile if the tailings were capped in place and quantifies the impacts that could result from such inundation. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in Section 2.1.4, an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of a catastrophic failure of an on-site disposal cell.

DOE has reviewed the recent Colorado Streamflow Simulation Report issued by the USGS. The USGS report states that under a PMF scenario, not the 100-year flood scenario, the river level would be 25 feet above the toe of the tailings pile. Under the 100-year flood scenario, the river level would be approximately 4 feet above the toe of the pile, as occurred during the 1984 flood. During this flood, the unprotected pile was not breached because velocities decrease when the river flows over its banks. The USGS report also confirms the conclusion in the DOE river migration report that under 100-year and higher flood conditions, the river velocities adjacent to the tailings pile would be well within the range that could be mitigated with conventional engineering approaches. If the on-site disposal alternative were selected, data in the USGS report would be valuable in designing the engineered barriers to river migration described in the EIS and recommended by the NAS. There are, however, responsible opposing views on this issue; these views are discussed further in Section 2.6.4 of the EIS.

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Document #684 Comment #2 Commentor: Weber, Ivan

- Capping won't prevent Colorado River centrifugal undercutting: Surficial "capping" or "armoring" of the pile will do little to prevent undercutting and collapse of the pile. As the pile rests on gravels and alluvial sediments of previous river-course migrations --- in other words, the river has been there, in the past --- there is no valid basis for assuming that the river channel cannot go through the site again. Given the potential for significant precipitation pattern changes due to regional global climate change impacts (as projected in Preparing for a Changing Climate: The Potential Consequences of Climate Variability and Change - Rocky Mountain/Great Basin, Feb 2003, Dr. Fred Wagner et.al., Utah State U.), the possibility that the historical range of variability of flows may be exceeded does exist. This introduces the possibility that our certainty about Colorado River behavior and dynamics may be reduced greatly. DOE may find itself armoring the site repeatedly, as has been the experience of many other river channeling projects (e.g., Mississippi and Missouri), or of harbor protection projects worldwide. This future risk must be factored into the calculus of this decision, especially the likelihood that the estimated lower costs of capping in place have been assigned erroneously. Initial costs may be lower, perhaps; but long-term costs, perhaps even in a timeframe of only a few decades, may be multiples of the initial cost.

Response:

See response to comment #1 regarding river migration and flooding. With regard to long-term management costs, DOE has included management costs in perpetuity but will consider the potential for additional costs under the on-site alternative in its final decision-making.
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Document #684 Comment #3 Commentor: Weber, Ivan

- Site structural instability: The subsurface fault trending NW-SE through the tailings site cannot be predicted to be stable, and may provide to the river a point of weakness to induce more northwestward cutting than could be supposed if the site consisted of homogenous strata. It is through rock structural weaknesses such as these that this great river manages to cut through great ramparts to seek the most hydrologically direct route to the sea. In terms of the Colorado River's history, to follow the path of least resistance enough to completely remove the Atlas Tailings site is a relatively small matter. It is not a geotechnically "strong" site.

Response:

A systematic evaluation of geologic processes that could affect the site is detailed in Section 4.1.1 of the EIS.
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Document #684 Comment #4 Commentor: Weber, Ivan

- Biogeochemistry neglected, Source control not accomplished by capping-in-place: Leaving tailings in place does not accomplish contamination source control. The DEIS is inadequate in its consideration of the processes by which ammonia and other “contaminants of concern” are leached from the tailings pile. Capping with relatively impermeable materials (clay from decomposed shale) and subsequent armoring may retard percolation of the meager precipitation that falls on the cap, but it will not stop capillary flow from below, or upflow induced by the area’s hydrological gradient and zones of rock weakness, such as the fault. Moreover, bacterial action, which is surely involved in ammonia formation, may not be retarded by capping if key microbiological communities will thrive on anaerobic conditions. This is often the case in tailings and waste rock piles, in which even some oxidizing bacteria require little or no air to perpetuate their effects.

Response:

Section 3.1.3 of the EIS presents characterization data for the tailings pile. In that section, mean tailings pore water concentrations for uranium, radium, and ammonia are presented based on site-specific characterization data. The flux from the tailing pile has been conservatively assumed to be equal to the existing average pore water concentrations without any additional degradation or geochemical transformations. There is no mechanism for capillary flow from below, or for ambient upflow induced by the area’s hydrological gradient and zones of rock (such as the fault), to leach contaminants from the tailings pile. Under aerobic conditions (such as are currently observed in the pile), bacteriological activity is typically involved in degradation of ammonia to nitrate, which would tend to decrease the ammonia concentration in the pile and ground water. Under anaerobic conditions, bacteriological activity is typically involved in reducing nitrogen gas and would not affect the ammonia concentration in the pile or in ground water. Therefore, the characterization and evaluation of the processes by which ammonia and other contaminants of concern are leached from the tailings pile is considered conservative and appropriate.

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Document #684 Comment #5 Commentor: Weber, Ivan

- Tailings contamination behavior if swept into the Colorado: Recent newspaper commentary suggesting that the contamination produced by the tailings would be diluted and homogenized into Colorado River waters and sediments, then sequestered in Lake Powell, are simplistic and probably wrong. Rivers only homogenize some materials, usually those of similar density and other physical characteristics. Materials of greater density get sorted and classified by rivers, accounting for placer deposits of gold, silver, tin, and other metals. Again, risk is involved in the objectionably negligent attitude that it's OK to let the river take away the tailings and 'naturally attenuate' the contamination. This would be a very bad decision, based on extremely reprehensible ethics and miserably deficient science.

Response:

NEPA requires DOE to evaluate very unlikely future scenarios that have a low probability of occurrence, but potentially significant consequences. These types of scenarios also have considerable uncertainty that cannot be overcome with additional calculations or science. In short, this type of estimation (predicting consequences from a future, unlikely catastrophic event) will never be accurate. Spending considerable resources to better evaluate this one area of uncertainty would not improve the overall accuracy of the final estimates because of the significant uncertainties associated with basic assumptions needed to evaluate this scenario (e.g., characteristics of the assumed future flood). Therefore, DOE believes that the evaluation presented in the EIS provides a reasonable analysis of this scenario.
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Document #684 Comment #6 Commentor: Weber, Ivan

- Human health impacts: Radon may undergo repeated episodes of release if and when the cap is compromised by collapse or cutting, due to outward river migration under the site. These episodes could be quite significant, depending on weather conditions, endangering human health to a far greater degree than projected for the relatively steady-state modeled in the DEIS.

Response:

In Section 4.1.17 of the EIS, DOE acknowledges the uncertainties associated with catastrophic failure, including river migration. However, DOE has determined that compliance with the 40 CFR 192 standards concerning protection of human health can be accomplished with existing technology and engineering controls. Section 2.6.4 has been added to the EIS to discuss responsible opposing views, including those on river migration.
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Document #684 Comment #7 Commentor: Weber, Ivan

- Wetlands impacts: The Matheson Wetlands Preserve may well be receiving contaminated flows passing under the river and emerging downgradient in the wetlands. This observation points out the complexity of hydrology in the area, and the urgent need to remove the source in order to remediate ground water contamination. Without source removal, this ongoing threat to wetlands and wildlife cannot be mitigated or halted. Selenium, particularly, appears not to have been accounted for it its potential teratogenic effects on birds, fish and amphibians --- particularly on birds in the Matheson Wetlands Preserve. The maximum selenium concentration reported in Appendix A2, 0.026 mg/L (26 ppb) is well beyond the appropriate limits for wildlife reproductive integrity, according to a growing body of literature on selenium aquatic biology (Lemly and others). The possibility, moreover, of synergistic effects exists. Literature cites, for example, selenium-vanadium interactive effects on wildlife, which cannot be ruled out as a condition created by continued presence of the Atlas Tailings on this site, and failure adequately to remediate ground water beneath the site, including extended effects into the deeper aquifer.

Response:

DOE does not believe that contaminants from the tailings pile are traveling under the Colorado River and emerging downgradient in the wetlands. The selenium concentrations in the Matheson Wetlands Preserve are naturally occurring and not related to the site. Similarly, dissolved ammonia has been identified in ground water on the east side of the Colorado River, and it is probable that its presence there is also solely the result of natural phenomena. Ammonia levels in wells screened within uncontaminated brine near the river are typically in the 3- to 4.5-mg/L range, which is the same range observed in ground water on the river's east side. In addition, oil and gas wells drilled into the Paradox Formation in the vicinity of the Moab Valley have encountered brine with ammonia concentrations as high as 1,330 mg/L. These observations, combined with multiple lines of evidence indicating that the river and lowlands lying directly east of it act as a discharge location for regional ground water (including brine from dissolution of the Paradox Formation), suggest that dissolved ammonia in ground water east of the river is naturally caused. In addition to text in the SOWP (DOE 2003a), Figure 5 of Gardner and Solomon (2003) indicates that the Colorado River and its eastern overbank area act as discharge locations for Paradox-derived brine. Further discussion of these opposing views is included in Section 2.6.4 of the EIS.

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Document #684 Comment #8 Commentor: Weber, Ivan

- Relocation is the only option: As a consequence of recognition of all these risks, moving the tailings is imperative. Other risks, such as from dust and radon during the relocation, can be reduced acceptably (indeed, must be controlled) by 'engineering controls.'

Response:

DOE will consider this comment along with the impacts identified in the comment in its final decision-making.

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Document #684 Comment #9 Commentor: Weber, Ivan

- Transport options: Practical considerations elucidated in the DEIS warrant respect, it goes without saying. As one involved in relocation of significantly greater quantities of various types of tailings, sludges and waste rock on Kennecott Utah Copper's unprecedented cleanup projects in the 1990s, I can only encourage the choice of least energy-consumptive option. Intuitively, rail is preferable if systems of excavation/loading and unloading/placement can be devised. The option that is obviously not adequately considered, that we believe may be critical to the feasibility of rail transport, is conveyor use at each end. It is a proven technology, utilized over longer distances than will be encountered at either Klondike or Crescent disposal sites, with ample flexibility to minimize multiple handling events and dust. Pressure slurry may be acceptable as an alternative transport means, but adequate treatment of slurry waters must be taken into account before discharge, under some conditions. Truck transport involves less chance of multiple handling, and greater flexibility of placement, but also involves much greater energy consumption than a rail/conveyor system. Truck activity at the tailings loading site may also present the greatest risk of uncontrollable dust, as well as of diesel emissions, which could contribute to already marginal air quality conditions in Moab during temperature inversions.

Response:

DOE agrees with the commentor's assessment of transportation options. For these reasons and others, transportation by rail has been identified as the preferred transportation mode. The specific technology to be applied to loading and offloading of the materials at each end of the operation has not yet been determined; this level of design is not required to support informed decision-making in identifying the preferred alternative. Conveyor systems for this application may well be appropriate.
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Document #684 Comment #10 Commentor: Weber, Ivan

- Disposal site options: Klondike Flats seems the preferred option, with White Mesa Mill absolutely ruled out.

Response:

For the reasons discussed in Section 1.4.5, DOE has identified transportation of the tailings to Crescent Junction by rail as its preferred surface remediation alternative.
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Document #684 Comment #11 Commentor: Weber, Ivan

White Mesa Mill has one of the worst records of contaminated materials handling we have ever encountered. In the course of recent review of process cell construction, we have learned of the woeful inadequacy of cell design, liner specification, subgrade preparation, drainage and monitoring system design and installation, and of liner installation, but particularly of liner covering with ‘protective’ soil materials. Instead of sand for bedding and covering liners, the cells are shown in QA/QC report photos to have been covered with soils characterized by large, angular rocks that almost certainly caused perforations in liners even before construction was completed. There is no reason, based on IUC’s record, to suppose that they are capable of doing any better with future lined basins, even with the assumption of regulatory authority by a more attentive staff at UDRC. IUC has not earned the public’s trust. Beyond this fact, the construction of a long pressure-slurry pipeline is fraught with construction and operational risk, and presents the inevitability of disposal of contaminated water, contaminated by the slurry event, itself. This ‘choice’ is no choice; White Mesa must be rejected prima facie.

Response:

IUC’s past operations at the White Mesa Mill were the responsibility of the NRC; the mill’s operations are now the responsibility of the State of Utah. If, in its final decision-making, DOE decided to implement an alternative other than the preferred alternative of off-site disposal at Crescent Junction, the commentor’s assertions would be explored further. The safety systems of a slurry pipeline that would prevent a significant release from a pipeline failure are discussed in Section 2.2.4.3.

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Document #684 Comment #12 Commentor: Weber, Ivan

Given our preference for rail/conveyor transport, Klondike Flats is the most appealing. Compared to the Crescent Junction site, there may also be factors of visual impacts and possible health exposures that should be considered. Either site is, by such a great margin, preferable to all the other alternatives that we find no objection to either.

Response:

See response to comment #10.

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Document #684 Comment #13 Commentor: Weber, Ivan

- Costs: The costs estimated by DOE, as well as by NRC and Price Waterhouse Coopers before DOE assumed responsibility for the site, appear beyond reason. We appreciate the need to be conservative in the direction of assuring adequate funds to do the job well, but we find no other cleanup in recent years to approach the per-unit relocation costs outlined. If any part of the project seems likely to exceed projected costs, we submit that it may be ground water remediation. Given the apparent inadequacy of DEIS analysis of sub-site geology and hydrology, there may be surprises in store.

Response:

Remediation costs represent DOE's best estimate of probable costs. DOE acknowledges that there are uncertainties (Section 2.6.3) and responsible opposing views (Section 2.6.4) that cannot be resolved to everyone's satisfaction, and that these issues have the potential to affect remediation costs.

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Document #684 Comment #14 Commentor: Weber, Ivan

Conclusions: The "bottom line" conclusions of our following of the issue, and our review of the DEIS document, supplemented by some modest investigation into subsurface geology and hydrology, as well as comparative visual survey of river morphology at others of the many curves in the region, are that 1) the tailings simply must be moved, and 2) they must be moved either to Klondike Flats or Crescent Junction, if another more suitable site is not identified between now and the time DOE commences these activities. There is no real choice. "No action," "cap in place" and "relocate to White Mesa Mill" are not responsible options, by any stretch of imagination, or applied engineering/environmental science. This is such a patently obvious case of governmental failure to hold a responsible corporation responsible that we can only hope and pray that DOE is able to pursue recourse for financial recovery from Atlas of some of these costs. As we say in the vernacular, "This just ain't right!" Emphatically, neither is it "right" to leave the tailings in place!

Response:

DOE will consider the commentor's opinion on the preferred alternative in its final decision-making. There would be no opportunity for cost recovery from Atlas; taxpayers would be responsible for the costs of final remediation.

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Document #689 Comment #1 Commentor: Grand County Council

The Grand County Council would like to thank the Department of Energy for the time devoted to the issue of remediation of the Atlas tailings pile. We recognize your agency has spent many years studying this issue and has been diligent in allowing for public input. We appreciate having this opportunity to formally respond to your study. The County, in fact, has anxiously anticipated the Draft Environmental Impact Statement on the Atlas tailings pile located at the gateway of our community on the shores of the Colorado River. After thoroughly reading and evaluating the DEIS, we would like to relay to you some continuing concerns regarding the disposition of the pile.

Response:

DOE appreciates the recognition of the efforts made to allow public and agency input into this important decision-making process. The efforts of the county as a cooperating agency have resulted in significant contributions to the generation of this EIS.
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Document #689 Comment #2 Commentor: Grand County Council

First, it appears that much of the document, Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Draft Environmental Impact Statement, was based on research that was conducted in 1994. Rather than approaching the subject from a broad spectrum of alternatives, the old research tends to be myopic and focus only on capping the pile in place. Newer studies approached the issue more comprehensively and used more current scientific tools and modeling. It is significant that the conclusions of all of these studies are in direct conflict with those reached by the DOE. All of the newer data suggests that moving the tailings pile is the most appropriate solution for the health and safety of all western states that rely upon the water of the Colorado River. These studies, conducted independently by the United States Geological Survey, Dr. Kip Solomon of the University of Utah, and Dr. John Dohrenwend of the University of Arizona, contradicted all of the DOE's findings regarding the stability and migration of the Colorado River. It is Grand County's position that the DOE simply did not utilize the most available and current science and that these later studies and their conclusions should be acknowledged.

Response:

Most of the technical information and modeling studies presented in the EIS are based on new data collected by DOE after 2001. They are presented in calculation sets and in the SOWP (DOE 2003a). The scope of DOE analyses also extends beyond research that was conducted in 1994 in that DOE evaluated a no action alternative and three off-site disposal alternatives in addition to on-site disposal, as required by NEPA. DOE acknowledges the work performed by the University of Utah, the University of Arizona, and the study conducted by the USGS, but disagrees that their results contradict all of DOE's findings regarding the stability and migration of the Colorado River. Further discussion of these responsible opposing views has been included in Section 2.6.4 of the EIS.
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Document #689 Comment #3 Commentor: Grand County Council

It also appears that the DEIS did not take into consideration the findings of the National Academy of Science. At the core of the NAS Committee's findings is the conclusion that the DOE has made some dangerous assumptions regarding the stability of the Colorado River in its relationship to the Atlas tailings pile. These assumptions and uncertainties discredit the DEIS and cause Grand County to insist the DOE proceed with the solution that will afford the greatest level of protection to the health and safety of the public. That solution is to move the tailings pile to a safer location within Grand County.

Response:

The NAS report to the Department, dated June 11, 2002, stated, "While one cannot predict the timing of river migration (over the coming millennia or in the next several decades), the committee sees it as a near certainty that the river's course will run across the Moab site at some time in the future, unless engineered barriers prevent it from doing so." The Department agrees with the NAS conclusion that at some point in the future, especially considering geologic time, the river will cross the Moab site. The Department's analyses conclude that engineering controls (see Section 2.1.1.1) can be used to resolve this issue for the near term (200 to 1,000 years). If on-site disposal were selected, the cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell. In addition, a new Section 2.6.4 (Responsible Opposing Views) has been added to the EIS. It includes a detailed discussion of DOE's view and responsible opposing views on river migration.
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Document #689 Comment #4 Commentor: Grand County Council

Briefly, the NAS findings, with which Grand County concurs, include the following points:

1) It cannot be assumed that the course of the Colorado River will remain in its current position over the next 1000 (or more) years. Specifically, their study states it is a "near certainty that the river's course will run across the Moab Site at some time in the future."

Response:

See response to comment #3.
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Document #689 Comment #5 Commentor: Grand County Council

2) It is not accurate to suggest there is a low potential for lateral migration of the Colorado River. The NAS states that the DOE appears to be "overly optimistic" with regard to the migration of the river. Indeed, lateral movement of the river channel away from and toward the pile has been observed since this stretch of the Colorado River was first surveyed for possible dams in 1944.

Response:

See response to comment #3.
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Document #689 Comment #6 Commentor: Grand County Council

Additionally, while the DOE analysis supports the position that "any potential river migration toward the pile would not occur as a catastrophic event but rather gradually in small increments…" Grand County does not believe this is a valid assumption. There is historical data substantiating floods flowing at 66,100 cubic feet per second (cfs), (1914) 76,800 cfs (1917), 65,000 (1928), 64,400 cfs (1941), 64,200 cfs (1957), 61,900 (1983) and 70,300 (1984). Additionally, a flow of 125,000 cfs was analytically presumed to have occurred in 1884. The river begins to encroach the pile starting at the lowest of these flows. Should the worst event occur, water contaminated by the highly hazardous material could actually encroach into the City of Moab leaving residential and agricultural land contaminated.

Response:

The EIS acknowledges the potential for flooding of the tailings pile under the on-site disposal alternative and quantifies the impacts that could result from such inundation (Section 4.1.3.1). These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in the EIS, an on-site disposal cell (Section 2.1.1.3) would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would reduce the already low likelihood of catastrophic failure of an on-site disposal cell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall if this alternative were selected.
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Document #689 Comment #7 Commentor: Grand County Council

It is Grand County's position that the DOE cannot and should not make the assumption that a catastrophic event will not occur. The power of water, illustrated most dramatically by the tsunami that occurred in the Indian Ocean killing a quarter of a million people, mocks science and technology and renders short-term statistical analysis meaningless. Closer to home we have seen the same powerful impacts of water throughout California and southern Utah as homes have been swept past barriers into the sea and rivers from catastrophic rainfall and flooding.

Response:

DOE's analyses find that there are no probable mechanisms for catastrophic failure; however, for purposes of supporting decision-making, the consequences of such a failure have been included in the EIS (Section 4.1.17), and the differing opinions and uncertainties regarding this position are included in Section 2.6 (also see response to comment #6).
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Document #689 Comment #8 Commentor: Grand County Council

We also cannot dismiss the presence of two reservoirs upstream from the Moab Site that have never been studied in terms of their impact in the event they fail as the result of a natural disaster or an act of human terrorism. The sudden release of those waters into the Colorado would represent a wholly unpredictable catastrophic event.

Response:

DOE did not analyze specifically the sudden release of water from the two reservoirs upstream of the Moab site because the impacts of a catastrophic flood were assessed generally. The EIS analyzes the impact of a generic catastrophic flood event (300,000 cfs), which is the NRC-specified PMF, and determined that it would have serious adverse impacts on riparian plant and animal life and would affect the health and safety of residents along the river and of river guides. Even though the on-site alternative would include armaments that would further reduce the already low likelihood of catastrophic failure from a PMF, Section 4.1.17 quantifies the impacts of a catastrophic pile failure. Anticipated periodic flooding from more frequent 100-year flood events is assessed in Section 4.1.3.1.
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Document #689 Comment #9 Commentor: Grand County Council

3) While the DOE believes that failure of engineered barriers and the consequences of such a failure can be managed, Grand County agrees with the NAS assessment of such an assumption that "…our society's capacity to guarantee that harm will be prevented is limited."

Response:

See response to comment #3.
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Document #689 Comment #10 Commentor: Grand County Council

4) The DOE states in the DEIS that a failure would produce "only small and transitory consequences downstream." The NAS report concludes that contamination could appear along the Colorado River from Moab to Lake Powell, requiring remedial action over a long period of time, if only to determine that the threat in a particular year or season is minimal or to declare certain areas off limits. The report discusses the potential of "hot spots" on the beaches and sandbars that could shift from place to place, year to year, or even season to season. It also suggests that the Matheson Wetlands Preserve could be damaged. Additionally, their report explains that, "Many people value the river for its religious and spiritual significance, its dramatic natural beauty, its importance as a water resource, its symbolic representation of the entire region; its importance as an ecosystem, and its centrality to the regional economy."

Response:

It is possible that pile failure could lead to downstream deposition of contaminated sediment in areas receiving considerable use by the public and result in higher exposures than those estimated in the EIS. Prediction of sediment behavior (including downstream deposition and partitioning to the surface water) in the event of pile failure is difficult and would depend on numerous factors. DOE believes that the assumptions used to assess risk in the EIS are adequately conservative and appropriate for this screening-level assessment of a highly unlikely event. DOE will consider the concerns of downstream users in its decision-making.
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Document #689 Comment #11 Commentor: Grand County Council

5) The DOE's conclusion is that the life-cycle cost of moving the pile is substantially higher than that of capping it in place and there is no substantial difference in the cost of groundwater remediation and long-term management between the alternatives. For reasons outlined in the following paragraphs, Grand County cannot concur that the life-cycle cost of moving the pile is less than that of capping it in place.

Response:

DOE will take the county's opinion into consideration in its final decision-making.
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Document #689 Comment #12 Commentor: Grand County Council

Among the most troubling oversights in the DEIS is the fact that the DOE dismissed any potential of damage to the environment or populations downstream from Grand County. The DEIS recognizes only minimal danger to the local area: "If 20 to 80 percent of the tailings pile were washed into the river, it would have serious adverse impacts on the riparian plant and animal life and would affect the health and safety of residents along the river and of river guides who many spend up to 50 days on the river in a given year. Such a flood event could also affect the tourist economy of Moab if users of the river corridor avoided the area after such an event." (DEIS Summary pg. S−41)

This statement by the DOE grossly and negligently underestimates the environmental and human impact of a Possible Maximum Flood or any other catastrophic event associated with the Colorado River and the Atlas tailings pile. If the 130-acre pile comprised of 12 million tons of waste were to be washed into the Colorado River, the adverse impacts would be immeasurable. Widespread and possibly permanent damage would be sustained not only in Grand County but also throughout the lower basin of the Colorado River drainage and the West. Millions of people live in cities and towns that rely upon the water of the Colorado River for agricultural purposes and/or drinking water. Most notably, major metropolitan areas such as Las Vegas, Nevada, rely upon the water from the Colorado. Likewise Los Angeles and all of southern California are dependent upon this river. The entire Palo Verde Water District including the Imperial Valley and Mohawk water districts rely upon the water from the Colorado River. Lake Havasu City, Arizona, Parker, Arizona, and the entire Parker Strip subsist upon water from the Colorado. Native American Indian nations use the Colorado River for agriculture and the river is, in fact, the cornerstone of their lives. Blyth, California; Yuma, Arizona, and the country of Mexico would all be significantly and irreparably impacted by damage to the Colorado River. Additionally, the water from the Colorado River is used to irrigate agricultural lands that supply crops and produce to the entire United States. The damage to the American West would extend immeasurably beyond Moab.

We suspect that the cost of moving one of the largest radioactive waste sites in the United States is at the center of the decision. We must protest such thinking, however, because no matter how high the cost of moving the tailings pile now, that cost would pale in comparison to the cost of a near impossible remediation of the Colorado River from here to the coast in the event of a catastrophic event. Additionally, the millions upon millions of agricultural lands that would be contaminated in the event of a natural or human disaster involving the Atlas tailings pile would wreak havoc upon economies throughout Utah, Nevada, Arizona and California. The cost to human lives is, frankly, not quantifiable.

A significant portion of the DEIS is devoted to the consequences of uncertainties: "It is important that decision-makers are cognizant not only of the nature and range of uncertainties, inherent in the EIS but also of the potential consequences of these uncertainties."

Document #689 Comment #12 - continued

Response:

Section 4.1.17 quantifies the impacts of a catastrophic failure under the on-site disposal alternative, even though the river velocities projected by the recent USGS studies, coupled with the side slope armament and river migration barrier, make catastrophic failure a highly unlikely event. The analyses show that the impacts of a catastrophic failure would not be detectable below Lake Powell, and even in Lake Powell would not be of sufficient concentrations to cause measurable effects on human health.

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Document #689 Comment #13 Commentor: Grand County Council

Finally, we would like to cite the Floyd D. Spence National Defense Authorization Act of 1999, which states:

"Subject to the availability of appropriations for this purpose, the Secretary shall conduct remediation at the Moab site in a safe and environmentally sound manner that takes into consideration the remedial action plan prepared pursuant to section 3405 (1) of the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 (10 U.S.C. 7420 note; Public Law 105-261), including – (A) Ground water restoration; and (B) the removal, to a site in the State of Utah, for permanent disposition and any necessary stabilization, of residual radioactive material and other contaminated material from the Moab site and the floodplain of the Colorado River."

According to this federal law, we should not currently be participating in a debate as to whether or not to move the pile, but rather a discussion as to how quickly we can implement the transfer to a safe site.

Response:

DOE believes the commentor intended to cite the Floyd D. Spence National Defense Authorization Act for FY 2001, which does contain the language referenced. However, the Act also states in part that "The Secretary of Energy shall enter into arrangements with the National Academy of Sciences to obtain the technical advice, assistance, and recommendations of the National Academy of Sciences in objectively evaluating the costs, benefits and risks associated with *various remediation alternatives, including* removal or treatment of radioactive or other hazardous materials at the site [Section 3405 (i) – Remedial Action at Moab Site] …" [emphasis added]. Consequently, the Department has complied with the Floyd D. Spence Act for 2001 by evaluating various remediation alternatives, including both on-site and off-site disposal. In addition, DOE has complied with the requirements of NEPA by considering the range of reasonable alternatives, which includes the on-site disposal alternative and a No Action alternative.

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Document #689 Comment #14 Commentor: Grand County Council

Just as Grand County, and all of southeastern Utah, was willing to step up to the plate and produce uranium for the United States during the Cold War, the County is now willing to help protect the whole of the American West from this imminent danger. We are willing to keep this hazardous radioactive waste in our own back yard. We are not asking that any other community take on the burden of storing this waste.

Response:

DOE appreciates the county's willingness to accept disposal within the county.
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Document #689 Comment #15 Commentor: Grand County Council

The DOE held the responsibility for ensuring that the information upon which it bases the remediation decision is sufficient and of high quality. Grand County does not believe that responsibility was met. Therefore, the members of the Grand County Council representing the citizens of Grand County, and with the welfare of millions more citizens in the states of Utah, Nevada, Arizona, and California in mind, most respectfully demand the Atlas tailings pile be moved to another location in Grand County. We believe there should be no compromise when it comes to the health and safety of the public.

Response:

DOE is confident in the quality of the data used in EIS, the integrity of the analyses performed, and the adequacy of the EIS to support its decision-making. DOE will continue to consider the county's views regarding relocating the pile in its decision-making.
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Document #696 Comment #1 Commentor: Bruno, Jeanne-Marie—Park Water Company

Park Water Company appreciates the opportunity to provide comments on the Draft Environmental Impact Statement for Remediation of the Moab Uranium Mill Tailings. Park Water Company (PWC) is an investor-owned water utility providing water service to approximately 150,000 people in Los Angeles and San Bernardino Counties.

The Colorado River is a critical primary and supplemental source of drinking water for over 20 million consumers in Southern California. PWC consumers in Los Angeles County receive 90% of their water from the Metropolitan Water District of Southern California, a major contractor of Colorado River water. Protection of this vital resource is of paramount importance.

Response:

DOE agrees with the commentor's views on the value of the Colorado River. The Department believes that any of the action alternatives analyzed in the EIS would be protective of the river.
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Document #696 Comment #2 Commentor: Bruno, Jeanne-Marie

The Moab uranium mill tailings, however, threatens drinking water quality of the downstream users. Uranium concentrations in the tailings pore water are already over 750 times higher than the federal maximum contaminant level, and there is indication that these levels will increase. Groundwater concentrations at the site also exceed federal and/or California drinking water standards for other constituents including arsenic, mercury, thallium and radium.

Response:

Section 3.1.7.3 has been revised to clarify that site-derived contamination currently affects only a localized portion of the river and cannot be detected 0.5 mile downstream of the site. As discussed in Section 2.3.1.1, the ground water beneath the Moab site meets the criteria under 40 CFR 192 for supplemental standards as a limited-use aquifer and would be managed as such, regardless of whether on-site or off-site disposal is selected. As characterized in the EIS, DOE's preferred alternative of active ground water remediation would eliminate future threats from the Moab tailings to the quality of drinking water for downstream users.
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Document #696 Comment #3 Commentor: Bruno, Jeanne-Marie

With both the "no action" and "on-site" alternatives, contaminated seepage will continue to leak from the tailings pile and into the Colorado River: Reliable and permanent protection can only be achieved by moving the tailings pile off-site. This is consistent with the State of Utah's December 29, 2004 letter received by your agency that states that any remediation other than an off-site option is unacceptable. We strongly urge you to relocate the tailings pile.

Response:

DOE has considered the analyses provided in the EIS, the consequences of the uncertainties characterized in the EIS, and the comments received on the draft EIS. Based on these considerations, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water.
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Document #699 Comment #1 Commentor: Livermore, Dave—The Nature Conservancy

The Nature Conservancy ("Conservancy") appreciates this opportunity to review and provide comments on the Remediation of the Moab Uranium Mill Tailings Draft Environmental Impact Statement ("DEIS"). The Conservancy is a non-profit organization with a mission of preserving the plants and animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Supported by approximately one million members and 1,800 corporate sponsors, the Conservancy owns over 1,400 preserves - the largest private reserve system in the world. One such preserve is the Scott M. Matheson Wetlands Preserve ("Matheson Preserve")[1], which is located immediately across the Colorado River from the Moab Uranium Mill Tailings site. The Matheson Preserve is home to over 220 species of birds and is the last significant remaining wetlands on the Colorado River in Utah. As one of the nearest private landowners to the Moab Mill Site, we have much at stake and are very concerned that the Department of Energy ("DOE") selects the appropriate course of action to protect our private property and the biological integrity of the Colorado River. The Conservancy believes that the best alternative will be to relocate the Moab Uranium Mill Tailings to either the Klondike Flats or Crescent Junction disposal sites.

[1]Note: The DEIS indicates that the Matheson Preserve is owned by the Utah Department of Wildlife Resources; in actuality the northern portion (425 acres) is owned by the Utah Division of Wildlife Resources and the southern portion (470 acres) is owned by the Conservancy. This should be corrected in the Final Environmental Impact Statement.

Response:

DOE appreciates the Conservancy's role as a local landowner and custodian for the Matheson Wetlands Preserve. DOE will consider the Conservancy's views regarding the best alternative for relocating the Moab uranium mill tailings in its final decision-making. Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.

Section 3.1.12 of the EIS states that the Matheson Wetlands Preserve is jointly owned by UDWR and the Nature Conservancy.
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Document #699 Comment #2 Commentor: Livermore, Dave

Findings by Dr. D. K. Solomon and Phillip M. Gardner in a “Summary Report of Hydrologic Studies of the Scott M. Matheson Wetlands Preserve.”

In 2002, the Conservancy and the Utah Division of Wildlife Resources (“UDWR”) contracted with the University of Utah to investigate the hydrology of the Matheson Preserve, including sources of water to the wetland and the hydrologic connection between the wetland and the Moab Mill Tailings. Tritium, dissolved noble gas concentrations, and oxygen and deuterium isotope ratios were used to examine the sources and the history of the water present. Lithologic composition of the subsurface beneath the wetland was investigated by logging cores at three boreholes and examined together with the logs of 14 wells drilled by the DOE and borehole data presented by Doelling (2002). These methods, coupled with the analysis of groundwater uranium and ammonia concentrations, were used to explore the groundwater connection between the wetlands and the Moab Mill Tailings.

Response:

DOE is aware of these field activities and provided technical support to assist the University of Utah in collecting ground water samples on the Moab mill site. As discussed in more detail in the following response, migration of contaminants under the river to the Matheson Wetlands Preserve is one of three issues about which there are responsible opposing views; these views are discussed in Section 2.6.4 of the EIS.

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Document #699 Comment #3 Commentor: Livermore, Dave

Hydrologic Connection Between the Matheson Preserve and the Moab Mill Tailings

The river is not an absolute hydrologic barrier to groundwater movement. By examining and comparing borehole drill cores and logs, Solomon and Gardner were able to map the minimum extent of the thick permeable channel gravels which underlie the entire site (See Illustration A). These gravel deposits create a pathway for groundwater to underflow the Colorado River. Further, comparison of noble gases and tritium levels between the Glen Canyon Group Aquifer and the Matheson Preserve groundwater leads to the conclusion that water beneath the wetlands is coming from the north side of the river though these river gravels. Lastly, spatial distribution of uranium and ammonia found in wells on the Matheson Preserve suggests that uranium is migrating from the Moab Mill Tailings beneath the river and into the subsurface Matheson Preserve.

Response:

DOE disagrees with the University of Utah’s (Gardner and Solomon [2003]) assertion that contaminated ground water (ammonia and uranium) is migrating under the Colorado River and reaching the Matheson Wetlands Preserve. DOE’s conceptual model of ground water flow at and near the project site considers the Colorado River and perhaps a limited area just southeast of the river to be a site of both regional and local discharge for ground water. Ground water discharges to this area because the elevation of the river surface and shallow ground water to the immediate southeast is less than the flow potentials measured in ground water at the project site, in areas lying farther to the east and closer to the City of Moab, and in brine located below the river. Accordingly, ground water flow converges toward the river from all of these zones, and a ground water divide occurs either in the river itself or slightly east of the river. This flow pattern prevents water from migrating beneath the river to the Matheson Wetlands Preserve.

However, Gardner and Solomon’s view is a responsible opposing view of the fate and transport of site-derived contaminants in ground water. This view states that these contaminants have migrated, and continue to migrate, under the Colorado River toward the Matheson Wetlands Preserve and that they pose a potential hazard to public health and the environment. This view is based primarily on the interpretation of three types of information: (1) a potentiometric surface map based on calculated hydraulic heads that account for the effects of salinity on flow potential, (2) measured uranium concentrations in ground water on both sides of the Colorado River, and (3) analysis of stable isotopes of the dissolved oxygen and hydrogen in ground water. Both views on the question of contaminant migration under the river are based on differing interpretations of technical data. A new section on responsible opposing views (Section 2.6.4) has been added to the EIS. The section presents both views in detail and also discusses the implications of these opposing views.

The uncertainty surrounding DOE’s assumption about contamination affecting the Matheson Wetlands Preserve and the consequences are addressed in Tables S−1 and 2−33, item #11, of the EIS.

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Document #699 Comment #4 Commentor: Livermore, Dave

A Foundation of Sand and Future Flood Events

The core samples drilled on both sides of the river show that the Moab Mill Tailings rest on overbank deposits of very fine sands and silts that are 8 to15 feet deep. Found beneath these fine soils is a large, continuous package of gravel and cobbles, up to 150 feet thick, that was deposited by the Colorado River during periods of large and very forceful floods. To determine the date of such past flood events, Solomon and Gardner used carbon -14 dating on organic matter found in the boreholes at depths of 24 and 30 feet. At 24 feet the organic matter was less than 100 years old, and at 30 feet less than 1000 years old. These tests clearly illustrate that two flood events within the past 1,000 years have scoured to depths of 24 feet and 30 feet thus eroding away the foundation of sand and silt upon which the tailings currently sit.

Response:

DOE acknowledges the commentor's concern regarding the potential for the Colorado River to erode the tailings during a very forceful flood. As stated in the EIS, an on-site disposal cell would include side slopes armored with riprap of 12 to 36 inches (Section 2.1.4) to resist erosion from floodwaters and a barrier wall between the river and the capped pile to mitigate impacts from river migration. These measures would further reduce the already low likelihood of a catastrophic failure of an on-site disposal cell. USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall should this alternative be selected. The descriptions of the conceptual cell cover and barrier wall design have been expanded in Sections 2.1.1.3 and 2.1.1.4 of the EIS to state that riprap materials would be sized to withstand the maximum river forces identified by USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment.
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Document #699 Comment #5   Commentor: Livermore, Dave

River Migration

By mapping the known minimum extent of the subsurface channel gravel deposits as reconstructed from the well logs from both sides of the Colorado River, geologists can indicate the extent of past river migration. Illustration A clearly shows that the river has migrated to both the northwest and the southeast, and that the historic river bed is present beneath the current Moab Uranium Mill site. The DEIS uses engineering calculations to imply that the river will migrate only toward the southeast, and recognizes that there is some “uncertainty” in their migration model. However, the Solomon/Gardner findings unmistakably show that the river has historically occupied, and undoubtedly will again migrate in the direction of, the Moab Mill site.

Response:

DOE’s analyses in the EIS support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. There are responsible opposing views on the question of whether the Colorado River is migrating toward the tailings pile, which would tend to exacerbate flooding impacts, or away from the tailings pile, which would tend to mitigate flooding impacts. A new section has been added to the EIS (Section 2.6.4) to present these opposing views on river migration (and other topics) and summarize their technical basis and implications. DOE’s view is that although a conclusive prediction of future river movement is not possible, evidence suggests that the river is migrating, and will continue to migrate, to the south and east away from the existing tailings pile (see Section 2.6.4). The opposing view is that the river channel has not migrated away from the Moab millsite in the past 80 years, and that there is no reason to suppose that it will start to do so in the immediate future.

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Document #699 Comment #6 Commentor: Livermore, Dave

Findings of the U.S. Geological Survey in "Initial-Phase Investigation of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab Valley, Grand County, Utah, 2004."

The USGS recently completed a multi-dimensional stream flow model of the Colorado River near the Moab Mill Tailings. This model clearly shows the potential for developing a flow regime that exceeds the critical shear stress needed to scour the fine-grained deposits on which the Mill Tailings are founded. Although the application of rip rap at the toe of the Mill Tailings might armor the surface of the pile, it cannot prevent the river from undercutting the rip rap leading to failure. Unless the fine-grained deposits beneath the toe of pile are removed completely and replaced with rip rap that is founded on the underlying channel gravels, the rip rap armoring scheme is fundamentally flawed. As the cost of excavating the fine-grained deposits was not included in the cost estimates for the cap-in-place alternative, it too is fundamentally flawed.

Response:

DOE has reviewed the recent USGS report. The descriptions of the conceptual cell cover and barrier wall design have been expanded in Sections 2.1.1.3 and 2.1.1.4 of the EIS to state that riprap materials would be sized to withstand the maximum river forces recently identified in the USGS report and that the barrier wall would be of sufficient length to mitigate against river encroachment. If the on-site alternative were selected, the final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan. The estimated cost range for remediation (Table 2−33, item #9) would accommodate materials consistent with the USGS report.

Sections 4.1.17 and 2.6 of the EIS discuss the potential for the Colorado River to migrate and damage the tailings pile if the pile were not relocated. There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these opposing views (Section 2.6.4). If on-site disposal were selected, the side slopes of the on-site disposal cell would be armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the already highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly.
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Document #699 Comment #7 Commentor: Livermore, Dave

Conclusions from the Above Studies

The DEIS treats the findings of the Solomon/Gardner study by acknowledging that uncertainties exist in their hydrologic and river migration model and that the State of Utah disagrees with DOE's conclusions. The Conservancy's interest in the immediate area and Colorado River system cause us to recommend vigorously that DOE, in the Final Environmental Impact Statement (FEIS), not gloss over the above findings as mere "disagreements" in models that are acknowledged to have "uncertainties". Rather, the FEIS must seriously consider and examine the data collected and conclusions of the Solomon/Gardner report and the latest information published by the USGS. Failure to do so may result in a potential mistake of catastrophic proportions – one that could have enormous, long-term adverse impacts on the Colorado River and the Matheson Preserve, including the species which depend upon these systems for their survival.

Response:

DOE has added a new Section 2.6.4, which specifically addresses the differing opinions on this and other issues and the consequences thereof.
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Document #699 Comment #8 Commentor: Livermore, Dave

Potential Impacts to the Matheson Preserve

The Matheson Preserve was created to ensure the lasting protection of an important desert wetland system and its associated biological diversity. To this end, the Conservancy and UDWR are managing the area to allow for the natural processes, such as flooding, that help to sustain the natural communities and critical wildlife habitat. Remediation of the Moab Mill Tailings has the following potential impacts to the Matheson Preserve.

Cap-in-Place Alternative

The On-site Disposal or Cap-in-Place alternative presents numerous concerns for the Conservancy and potential adverse impacts to the Matheson Wetlands Preserve. This alternative will reduce, but not eliminate, the leaching of contaminants into the groundwater beneath the wetlands. If this is the selected action, then the FEIS should include a ground water remediation system that protects, and does not negatively affect the Matheson Preserve. The estimated cost of such a system should be added to the cost of the Cap-in-Place Alternative.

Further, under this alternative a rip rap wall is designed to help prevent the possibility of flood events eroding the foundation of the pile.[2] Rip rapping the northwest shore of the Colorado River will certainly alter the morphology of the Colorado River, impact the opposite shoreline and add detrimental erosional forces on the shores of the Matheson Preserve.

Catastrophic failure of the Cap-in-Place alternative is possible due to 100 and 500 year flood events. The DEIS addresses this by indicating that there would be “only small and transitory consequences downstream.” However, a Landsat satellite image taken on May 26, 1984, while the Colorado River was flowing 66,500 cfs (less than a 100 year flood event) shows that the river would be lapping at the base of the tailings and flowing through the Matheson Preserve and neighboring properties. Therefore, in future floods of this magnitude or greater, contaminants currently leaching from the tailings into the river will be deposited in hot spots throughout the Matheson Preserve and surrounding residential areas. If this were to occur, the Conservancy would have no choice but to close the preserve to the public, and could do little to prevent resulting potential mortality to native animals and plants.

[2]Note: The Solomon/Gardner and USGS report illustrates that normal flood events will undermine the rip rap wall, erode away the fine silt and sand underlying the tailings, thus causing the tailings to spill into the Colorado River, questioning the effectiveness of any rip rap.

Response:

As discussed in the response to comment #3, DOE’s position is that site-related contaminants are not affecting the Matheson Wetlands Preserve.

Under the on-site disposal alternative, a buried riprap barrier wall would be installed as a river migration mitigation measure; however, the analysis in the EIS indicates that a flood of sufficient erosional magnitude to reach the wall and be deflected by it would be highly unlikely. DOE does not concur with the Conservancy’s opinion that a buried riprap wall would “certainly alter” the

Document #699 Comment #8 - response continued

morphology of the Colorado River sufficiently to adversely impact the opposite shore. Moreover, any attempt to assess such an impact would be speculative in the extreme.

The EIS acknowledges the potential for flooding of the tailings pile under the on-site alternative and quantifies the impacts that could result from such inundation. These impacts include additional leaching of contaminants into the ground water and subsequent migration to the river. As stated in the EIS, an on-site disposal cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low likelihood of a catastrophic failure of an on-site disposal cell. If this alternative were selected, USGS data on potential flood velocities that might occur at the pile would be used for the final design of the riprap side slopes and the barrier wall. Although the impacts of a catastrophic failure are analyzed in Section 4.1.17 of the EIS in order to evaluate consequences and risks, DOE does not believe there are any credible scenarios that would result in a catastrophic disposal cell failure under the on-site disposal alternative.
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Document #699 Comment #9   Commentor: Livermore, Dave

Slurry Pipeline to White Mesa

The slurry pipeline route to White Mesa Mill disposal site indicates that the pipeline will cross the Matheson Preserve adjacent to an existing pipeline. The Conservancy will not willingly permit any further impact of either directional drilling or pipeline installation via open ditch through our property. The current pipeline easement allows one and only one pipeline. Therefore, this alternative as shown in the DEIS is not viable – unless the DOE asserts eminent domain and forces the issue by condemning a pipeline easement through our private property.

Response:

DOE acknowledges the commentor’s objection to the White Mesa Mill pipeline route. DOE will consider this comment in its final decision-making.
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Document #699 Comment #10 Commentor: Livermore, Dave

Dike in the Colorado River

In the mid-1960's the Atlas Mineral Cooperation constructed a dike in the Colorado River from the southeast shore to a midstream island. The purpose of this dike was to rechannel the main river flow to the northwest shore. The construction of this dike has undoubtedly reduced the frequency of flooding events in the Matheson Preserve. Flooding is a critical natural process which helps to regenerate Fremont cottonwood trees and retain year-round surface water. The Conservancy suggests that the DOE remediate this situation by removing the man-made dike, no matter which alternative is chosen.

Response:

This action is beyond the scope of the EIS; however, DOE will review this suggestion in the future.
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Document #699 Comment #11 Commentor: Livermore, Dave

Potential Impacts to Species of Concern

Endangered Fish and Species of Concern in the Colorado River

The DEIS acknowledges that the Colorado River has been designated as critical habitat for four endangered fish species: the Colorado pikeminnow (Ptychocheilus lucius), razorback sucker (Xyrauchen texanus), humpback chub (Gila cypha), and the bonytail (Gila elegans). Of the eight native fish species in the Colorado River, seven are listed as either federal or state species of concern. In 2000, the Columbia Biological Laboratory of the USGS measured 100% mortality of fish placed in cages near Moab Uranium Mill shore. The level of ammonia contamination considered acutely lethal is approximately 2 mg/l; USGS measured levels of 1,500 mg/l in areas of the river adjacent to the Moab Mill Tailings. Since that time DOE has started a ground water remediation system. However, the DEIS indicates that 15,000 gallons of toxic chemicals continue to reach the river each day. The DEIS also states that "At the upper limit of uncertainty, the actual concentrations of ammonia could be at least 10 times greater than predicted. Therefore, it is possible that the On-site Alternative would never achieve the 3-mg/L ammonia target goal. For the off-site alternative, there is no uncertainty that the target level would eventually be achieved, because the tailings which are the source of some of the ammonia would be removed."

This statement alone indicates that the best solution to protect the endangered aquatic species and species of concern would be to move the tailings away from the shores of the Colorado River and the Matheson Preserve.

Response:

DOE is aware of the existing impacts from this former uranium processing site and of the USGS surveys. That is why DOE has implemented interim actions, in consultation with USF&WS, to help keep contaminants in the ground water from discharging to the river. Currently, 20 ground water extraction wells are in operation, and there are plans to install additional capacity in the summer of 2005. DOE also has implemented an extensive surface water and ground water sampling program to closely monitor contaminant levels in the river. Through continued ground water extraction for the next 75 to 80 years, as indicated in the EIS, DOE expects contaminants to be maintained at levels that are protective of aquatic life. After 75 to 80 years, ground water extraction would no longer be necessary. This is the case under both the on-site and off-site disposal alternatives.

While acknowledging the uncertainty associated with the applicable surface water compliance standards (see Tables S−1 and 2−33, item #2, of the EIS), DOE believes that the final disposal cell design and ground water remediation strategy, which would be developed in a remedial action plan after the Record of Decision is issued, would meet the requirements in 40 CFR 192 for environmental protection, regardless of whether the on-site or off-site disposal alternative were selected.

Document #699 Comment #12 Commentor: Livermore, Dave

White-Tailed Prairie Dog Colonies

Both the Klondike Flat and Crescent Junction disposal sites are in close proximity to White-tailed prairie dog (Cynomys leucurus) colonies. Further, the slurry pipeline transportation route to these disposal sites would cross through White-tailed prairie dog colonies. If one of these sites were to be chosen as the preferred disposal site or if a pipeline is the preferred mode of transportation, we would recommend conducting surveys, and working closely with the UDWR to minimize any potential disturbance to these prairie dog colonies.

Response:

DOE concurs with the commentor's concerns. In Chapter 4.0 of the EIS and in the Biological Assessment (Appendix A1), DOE has committed to conducting the investigations recommended in the comment as part of the detailed site characterization that would be conducted if DOE selected one of these off-site disposal locations in its Record of Decision. These investigations would be undertaken in collaboration with the UDWR.
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Document #699 Comment #13 Commentor: Livermore, Dave

Gunnison Sage-grouse

The pipeline route to the White Mesa Mill site would impact historical habitat and be in close proximity to current populations of Gunnison sage-grouse (Centrocercus minimus), a federal candidate for listing as an endangered species. Coupled with the impacts to the Matheson Preserve of the proposed route, the Conservancy adamantly opposes this alternative and transportation route.

Response:

As conceptually presented in the EIS, the pipeline route to White Mesa Mill is in the vicinity of Gunnison sage grouse habitat. Section 4.4.7.3 of the EIS and Section A1−8.1.10 of the Biological Assessment state that investigations would be completed prior to construction of a pipeline to White Mesa Mill if that site were selected. If the alternative selected in the Record of Decision could adversely affect this species, mitigation measures would be required and undertaken.

DOE acknowledges the value of the Matheson Wetlands Preserve and the Conservancy's strong opposition to actions that would result in adverse impacts to it. DOE will consider this view in its selection of a disposal alternative in the Record of Decision.
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Document #699 Comment #14 Commentor: Livermore, Dave

Other State Sensitive Wildlife Species

Kit fox (Vulpes macrotis), burrowing owls (Athene cunicularia), black-footed ferrets (Mustela nigripes), golden eagles (Aquila chrysaetos) and ferruginous hawks (Buteo regalis) may all be impacted at the designated borrow areas or Klondike Flats and Crescent Junction disposal sites. The Conservancy recommends conducting onsite surveys in any disturbed areas and working closely with the UDWR to minimize any potential disturbance to these wildlife species of concern.

Response:

See response to comment #12.
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Document #699 Comment #15 Commentor: Livermore, Dave

Plant Species of Concern

Although, the Conservancy knows of no occurrences of special status plants in the off site disposal areas, borrow sites, or pipeline routes, we still recommend on-site surveys be conducted, at the appropriate time of year for such plants in the selected disturbed sites.

Response:

On-site surveys for special status plants would be conducted only if evidence pointed to their occurrence in the vicinity of proposed disturbances. In Appendix A3, Biological Opinion, the USF&WS has concurred with DOE's determination (Appendix A1, Biological Assessment) that special status plant species are unlikely to be adversely affected. However, if evidence of special status plants in the vicinity of the selected disposal site, at borrow areas, or along the selected transportation corridor became available to DOE, further investigations or surveys would likely be warranted and undertaken.
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Document #699 Comment #16 Commentor: Livermore, Dave

The Nature Conservancy urges the DOE to select an action alternative that will reduce the number of uncertainties, protect the biological integrity of the Colorado River and Matheson Preserve, and avoid a catastrophic event of contaminated tailings being deposited in the Colorado River and Matheson Preserve. We encourage the DOE to refine their hydrologic model and river migration calculations to include the data and information gathered by Solomon and Gardner. With these considerations in mind, the only acceptable action is to move the tailings pile to either the Klondike Flats or Crescent Junction disposal sites. This is the obvious and safe alternative.

Response:

DOE acknowledges and appreciates the commentor's recommendations for selecting an alternative that would reduce the number of uncertainties, protect the biological integrity of the Colorado River and Matheson Wetlands Preserve, and reduce the already low probability of a catastrophic failure that could deposit contaminated tailings in surface waters. DOE believes that it has a sufficient understanding of the hydrologic conceptual model and river migration conditions, which includes appropriate evaluation and consideration of the data and information gathered by Gardner and Solomon, to support sound decision-making. DOE is confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192 under any of the action alternatives analyzed in the EIS.

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Document #706 Comment #1 Commentor: Fields, Sarah

It is our position that the Moab Mill's tailings pile be moved by the existing railroad to an Off-Site Disposal Alternative in the Mancos shale deposits north of Moab. We believe that the Crescent Junction Alternative would be more protective of the environment and the health and safety of the public over both the short and long term than the Klondike Flats Alternative.

Response:

Based on consideration of all the technical data, uncertainties, and comments on the draft EIS, DOE has identified the Crescent Junction site using rail transportation as its preferred surface remediation alternative.
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Document #706 Comment #2 Commentor: Fields, Sarah

The Cap-In-Place Alternative is unacceptable because the Department of Energy (DOE) would not be able to provide reasonable assurance that the site would be reclaimed in such as manner that it would be protective of the environment and the health and safety of the public over the even the minimal reclamation standard time frame (200 to 1000 years) let alone over the thousands of years that the tailings would remain hazardous and the DOE would have total responsibility for the integrity of the site.

Response:

Though additional studies would be required if the on-site disposal alternative were selected, DOE believes, and the EIS indicates, that this alternative could be implemented to comply with the requirements of UMTRCA and 40 CFR 192 without unacceptable adverse impacts on public health and safety and the environment for the minimum regulatory period of 200 to 1,000 years. Section 2.6.3 identifies the uncertainties associated with the disposal alternatives, and Section 2.6.4 identifies responsible opposing views to those of DOE on several technical issues.
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Document #706 Comment #3 Commentor: Fields, Sarah

The Moab site is an inherently unstable site, with an unknown history and an unknown future. The more the site is studied, particularly by an independent person or entity, the more questions arise related to the long-term suitability of the site. The subsurface of the site has never been adequately characterized by a full and independent study. The DOE needs to conduct a study that is solely dedicated to determining the past history of Colorado River meander under the site, the factors related to subsidence, the geological structures under the site, and the relationship of these features of the site to the Colorado River and movement of contaminants. Without such studies, the DOE has no basis for any assurances regarding the stability and suitability of the Moab site. If the DOE is unable or unwilling to assign such a study to a qualified outside entity, such as the U.S. Geological Survey (USGS), then it has no scientific basis for leaving the tailings in place.

Response:

DOE believes the results of the DOE study on river migration and the subsurface investigations conducted as part of the SOWP (Section 5) are adequate for identifying a preferred alternative in this EIS and will be adequate to support DOE's final decision-making. DOE has incorporated findings from other qualified outside entities such as the USGS in the design of the protective barrier, which would be a key river migration mitigation measure if the on-site alternative were selected. DOE acknowledges the uncertainties associated with geologic processes and will continue to consider these uncertainties in the decision-making process. Uncertainties are addressed in Tables S−1 and 2−33 of the EIS.

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Document #706 Comment #4 Commentor: Fields, Sarah

The current uncertainties, which are accumulating, call into question past DOE and Nuclear Regulatory Commission (NRC) assumptions regarding site suitability. I would refer the DOE to the recent studies by Dr. John Dohrenwend regarding Colorado River meander, the studies by Dr. Kip Solomon, and the recent study by the USGS, Scientific Investigations Report 2005 – 5022 Initial-Phase Investigation of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab Valley, Grand County, Utah, February 2004, U.S. Department of the Interior, USGS.

Response:

As a result of input developed in the public comment process and consultations with the 12 cooperating agencies, DOE has identified three general topics on which there exist responsible opposing views to the Department's position regarding the remediation alternatives for the Moab site: river migration, contaminated ground water flow under the river to the Matheson Wetlands Preserve, and the appropriate compliance standard for aquatic species in the river. Section 2.6.4. summarizes the responsible opposing views on these topics.

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Document #706 Comment #5 Commentor: Fields, Sarah

The White Mesa Alternative is also an unsuitable option. It is the most costly, the most technically complex, would have unacceptable impacts on low-income and Native American communities, would have unacceptable adverse impacts on cultural resources of the Native American communities that would be impossible to mitigate, would destroy at least a dozen significant archeological sites at the International Uranium (USA) Corporation (IUSA) Uranium Mill, and is too close to a human population. There is the potential for contamination of a major water resource aquifer underneath the site. Such contamination would destroy the aquifer as a significant water resource for the surrounding community.

Response:

Section 2.7.3 identifies the White Mesa Mill alternative as the most expensive of the alternatives considered and likely the most technically complex. Impacts on cultural resources and traditional cultural properties associated with construction activities at the White Mesa Mill site are identified in Section 4.4.9. Section 3.4.5 of the EIS does indicate that the uppermost aquifer below the site is a significant water resource that discharges at Ruin Spring; however, the estimated travel times to ground water are several thousands of years (Section 4.4.3.1). Should contamination reach the water table, adverse impacts to the ground water could occur.
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Document #706 Comment #6 Commentor: Fields, Sarah

The DOE failed to prepare the DEIS "in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.), the Council on Environmental Quality (CEQ) regulations that implement the procedural provisions of NEPA (40 CFR Parts 1500-1508), and the DOE procedures implementing NEPA (10 CFR Part 1021)" as claimed by the DOE. See 67 Fed. Reg. 70256 (December 3, 2004).

The CEQ NEPA regulations set forth many agency requirements for a DEIS. As will shown below, in numerous instances, the DEIS failed to meet the directive to "provide full and fair discussion of significant environmental impacts." See 40 C.F.R. § 1502.1 (Purpose). DOE's NEPA implementing regulations state that, "it is DOE's policy to follow the letter and spirit of NEPA" and "comply fully with the CEQ Regulations." The DOE also adopted the DEQ regulations into their own regulations. See10 C.F.R. § 1021.101 (Policy) and § 1021.103 (Adoption of CEQ NEPA regulations).

Response:

DOE believes that the EIS meets all CEQ and DOE NEPA requirements.
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Document #706 Comment #7 Commentor: Fields, Sarah

The DEIS does not meet the requirements of 40 C.F.R. § 1502.24, (Methodology and scientific accuracy), which states:

Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix.

Response:

The analyses were prepared by knowledgeable and experienced scientists and engineers. Wherever applicable, reference citations have been provided, and the references have been placed in the public reading rooms.

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Document #706 Comment #8 Commentor: Fields, Sarah

The DIES failed to properly cite references. References are very general or missing entirely. There is no cites to specific pages, paragraphs, sections, figures, tables, maps, etc. Often there is no reference at all for assertions, data, and conclusions contained in the DEIS. Contrary to CEQ regulations, there are no “explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement.” The DEIS often references the 2003 Site Observational Work Plan (SOWP), never providing a page or volume number. These references to this massive, complex, 3-volume document do not suffice as “explicit references.”

Response:

See response to comment #7. The SOWP has a thorough table of contents that includes bookmarks and hyperlinks to facilitate the interested reader’s access to any specific area of interest.

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Document #706 Comment #9 Commentor: Fields, Sarah

The DEIS, Section 1.2.1, states that Atlas Corporation's "decommissioning of the mill began in 1988, and an interim cover was placed on the tailings pile between 1989 and 1995." This statement regarding the presence of an interim cover on the impoundment is reiterated elsewhere in the DEIS. The statement is not followed by any other discussion of the fate of that "interim cover." Thus, the reader would get the mistaken impression that there was, indeed, an "interim cover" on the impoundment.

The placement on an "interim cover" on the impoundment was required by a condition of Atlas Corporation's license (License Condition 55, License No. SUA-917, Docket No. 40-3453), which established site reclamation milestones for Atlas's Moab Uranium Mill. That requirement was based on a Memorandum of Understanding between the Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC), and affected NRC Agreement States. See 56 Fed. Reg. 55432-55435, October 25, 1991.

Response:

The interim cover was installed in order to provide for short-term protection of the public and the environment. Regardless of the disposal alternative chosen, the interim cover in essence is a barrier left in place while measures for final disposal are decided. Once the decision for disposal is made, engineered plans for disposal would include the interim cover as part of the material to be disposed of. Until engineered disposal plans are developed, accepted, and approved, and operations for final disposition of the tailings begin, the interim cover will remain in place.
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Document #706 Comment #10 Commentor: Fields, Sarah

The interim cover placed on the impoundment by Atlas did not prevent contaminants from rising to the surface of the impoundment. According to Atlas:

> The capillary rise in unconsolidated silts that are as fine as Atlas' slimes can be as much as seven feet, of more - Groundwater Hydrology, by David Keith Todd, table 2.4 on page 35.
>
> Evaporation of the upward-seeping [tailings] solutions from near-surface[3] saturated slimes has continued until three to six inch thick salt crusts formed over the slimes by the summer of 1995, thus contributing to the progressive stabilization of the central slimes tailings area. [no footnote included]

See Transmittal of Atlas Corporation's As-Built Construction Report for the Completion of the Interim Cover, from Richard Blubaugh, Atlas Corporation, to Dan Gillen, NRC (October 16, 1996).

Subsequently, in 1999 PricewaterhouseCoopers (PWC) took over as trustee and licensee for the site. Contractors for PWC reworked the surface of the tailings impoundment, and contaminated materials from the site were placed on the impoundment. According to PWC's proposed dewatering program:

Document #706 Comment #10 - continued

The existing surface of the tailings, within the limits of the [“exposed”] saturated slimes would be minimally regraded and a thin working layer would be placed as required for equipment access. The working layer is anticipated to be approximately 3.5 feet thick, and would be constructed primarily with coarse tailings (sand) from the surface of the [tailings] facility. Areas of the saturated slimes that are to be excavated to form the final subgrade surface are excluded from this step. [Page 1.]

Recontouring and grading of the remainder of the subgrade with [contaminated] fill material (e.g., up to the interim cap elevation, prior to the clay final cap) will proceed inward from the outer edges of the tailings surface. Material needed for this fill will be moved from the mill area of the Site where early characterization indicates presence of the highest levels of windblown tailings and other contaminants. . . . [Page 2.]

See letter from Keith Eastin, PWC, to Philip Ting, NRC, regarding “Docket No. 40-3453, License No. SUA-917, Atlas Moab Uranium Mill tailings Facility - Dewatering Design” (August 25, 2000).

On September 12, 2000, NRC Staff approved PWC’s dewatering plan. The September 12 stated that the “design details of the dewatering plan were submitted by letter dated August 1, 2000, and supplemented by submittals dated August 3, 2000, August 4, 2000, and August 25, 2000. See letter from Philip Ting, NRC, to Keith Eastin, PWC, (September 12, 2000).

Atlas’s “slimes” became PWC’s “exposed” slimes. Atlas’s “3 to 6 inch salt crust was proposed to be reconstituted as PWC’s “soil cover [advanced] across remaining [exposed] slimes area.”

On November 14, 2000, an NRC geotechnical engineer observed earthwork operations being conducted on the Moab Reclamation Trust tailings pile. The NRC viewed daily construction records and work plans for repairing the tailings pile. The construction operations included the regrading of outslopes, excavation of course tailings, and excavation/hauling of slime tailings. According to the daily summaries, construction operations began on September 14, 2000, and included excavation and hauling slimes, and excavation of course tailings. With permission from the NRC, the licensee began regrading the outslopes of the tailings pile on October 23, 2000. Most of a the construction activity was routine, with the following exceptions:

On October 9th, a mud wave was generated as tailings were spread over the lowest area in the center of the site.” [Pages 3−4.]

The contractor indicated that about 70 percent (estimated 17, 000) of the [dewatering] wicks had been installed as of November 14, 2000. . . . A small amount of saturated tailings slime was brought to the surface at each wick installation. [Page 4.]

See letter from D. Blair Spitzberg, Chief, Fuel Cycle and Decommissioning Branch, Region IV, NRC, Arlington, Texas, to Jim Langley, Manger, Financial Advisory Services, PWC, regarding NRC Inspection Report 40-3453/00-01 (and enclosures thereto) (February 6, 2001), Executive Summary.

During and after the PWC reworking and placement of contaminated materials on the impoundment there began a period of extensive off-site wind-blown contamination from the site.

Document #706 Comment #10 - continued

PWC eventually just stopped work and did not provide the NRC with the as-built drawings of the work that they had completed on the impoundment.

The DOE should provide the public with a complete picture of all the work done related to the disturbance of the top and slopes of the original interim cover.

The DEIS must provide complete and accurate information on the status of the cover at the site and not give the public and decision-makers the distinctly false impression that a fully operable "interim cover" is in place.

Response:

Sections 2.1 and 2.2 clearly indicate that a newly designed and NRC-approved cover would be required for either an on-site or off-site disposal cell. Other than under the No Action alternative, no credit has been taken for the interim cover in modeling long-term performance. As a result, DOE sees no need to provide a detailed history of the actions of the parties with previous responsibilities for the site.

All of DOE's interim actions are allowed under CEQ's NEPA regulations to protect human health and the environment because the actions do not prejudice the outcome of DOE's remediation decision. Each interim action has been independently reviewed in accordance with its own NEPA evaluation by the appropriate federal and state agencies and has been presented to the public through meetings and web page listings. This information is fully disclosed in the EIS. All of DOE's interim actions are designed to reduce human health and environmental risks.
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Document #706 Comment #11 Commentor: Fields, Sarah

Disposal Cell Failure from Natural Phenomena, Section 4.1.17 of the DEIS.

The apparent purpose of this section of the DEIS is to make it appear that the impacts from a disposal failure would be minimal and acceptable. This section trivializes, distorts, minimizes, or completely ignores the impacts on the environment of a catastrophic disposal cell failure.

NEPA demands that there be a full and fair discussion, or assessment, of the significant environmental impacts of a disposal cell failure due to impacts of natural phenomena from geological forces or from the Colorado River. As will be shown below, this section of the DEIS fails to provide such a discussion. See 40 C.F.R. § 1501.1, "Purpose."

Response:

Even though DOE believes that there are no plausible mechanisms for catastrophic failure of an on-site disposal cell, DOE analyzed the consequences of such a failure. The analyses in Section 4.1.17 serve as a screening tool to demonstrate that there could be significant differences among the on-site and off-site alternatives to support decision-making. The commentor may disagree with the results of these analyses, but these analyses do not trivialize, distort, minimize, or ignore the potential impacts on the environment.
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Document #706 Comment #12 Commentor: Fields, Sarah

DEIS (page 4−50): Although the probability of a significant release would be very small over the design life of the on-site disposal cell, this type of failure was assumed to occur in order to evaluate the potential consequences (risks).

Comment: The DOE errs in only considering the potential of severe flooding "over the design of the on-site disposal cell" and the impacts of a catastrophic during that time frame. There is no time limit on the consideration of reasonably expected environmental impacts that must be considered in an NEPA document.

Response:

No limit is placed on the time of occurrence of either flooding, which DOE assumes would occur periodically forever, or catastrophic failure. In fact, the analyses are conservative in this regard in not reducing the concentrations of some contaminants that would degrade over time. The EIS assesses all potential sources of impacts to human health and the environment for the appropriate durations. For example, it is acknowledged that basin subsidence will result in an on-site pile coming into contact with ground water in 7,000 to 10,000 years, at which time additional impacts would be possible. Conversely, worker exposures are only calculated for the few years' duration of their exposure.

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Document #706 Comment #13 Commentor: Fields, Sarah

The DIES totally ignores the fact that the DOE will have responsibility for the impoundment, essentially, forever. The DEIS fails to address the probability for a "significant release" during the length of time that the federal government will have responsibility for the site and responsibility for the clean-up of any contamination or tailings released from the site.

It is arbitrary for the DOE to assess the potential impact to the impoundment for only 200-1000 years. There is no legal basis for the DOE putting a time limit on consideration of potential environmental impacts that would result from leaving the Moab Mill tailings in place.

It was the intent of Congress that "uranium mill tailings disposal sites should in all cases be controlled and regulated by States and the Commission, to the maximum extent allowed by the state of the art, to insure that the public and the environment will be protected from the hazards of the tailings for as long as they remain a hazard." House Report No. 95-1480—Part I, p. 17-18.

Response:

DOE acknowledges its perpetual responsibility and has included the cost of such activities in Section 2.7.3 of the EIS. The 200 to 1,000 years is not arbitrary; it is a regulatory requirement in 40 CFR 192. The EIS evaluates the ability of all disposal alternatives to meet the objectives of the cited House report.

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Document #706 Comment #14 Commentor: Fields, Sarah

DEIS (page 4−50): "Several processes could affect the integrity of the disposal cell at the Moab site:

- River Migration--The Colorado River could migrate into the disposal cell over an extended period of time. Because this river migration would be assumed to occur over many years, a failure of long-term management of the pile would also have to occur for tailings releases to be significant."

Comment: The DEIS does not explain what the basis is for the assumption that river migration would occur over a period of years. In a flood event, the river could migrate rapidly, creating a new channel. The DEIS fails to consider the possibility of a catastrophic flood after a period of channel migration towards the impoundment.

Prudence demands that the DOE not rely on "long-term management of the pile" for assurances that the impoundment would not be compromised by natural forces. As stated in House Report accompanying the passage of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), "The committee believes that uranium mill tailings should be treated by the custodian in accordance with the substantial hazard they will present until long after our existing institutions can be expected to last in their present forms." House Report No. 95-1480—Part I, p. 17.

Response:

DOE's analyses support a conclusion that the river will not migrate toward the pile during the 200- to 1,000-year regulatory time frame. Section 4.1.17 and Section 2.6 of the EIS discuss the potential for the Colorado River to migrate and damage the tailings pile if the tailings were not relocated. There are responsible opposing views regarding river migration. The EIS has been expanded to present and discuss these opposing views (Section 2.6.4). If on-site disposal were selected, an on-site disposal cell would include side slopes armored with riprap (Section 2.1.3.1) of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall (Section 2.1.4) between the river and the capped pile to mitigate against river encroachment. These engineered designs would further reduce the highly unlikely chance of a catastrophic failure of the disposal cell should river migration begin to occur unexpectedly.

The descriptions of the conceptual cell cover and barrier wall design have been expanded in the EIS (Sections 2.1.1.3 and 2.1.1.4) to state that riprap materials would be sized to withstand the maximum river forces recently identified by USGS and that the barrier wall would be of sufficient length to mitigate against river encroachment. The final design specifications for the wall (including, for example, its dimensions) would be developed in a remedial action plan if the on-site alternative were selected. The estimated cost range for remediation (shown in Table 2−33, item #9) would accommodate materials consistent with the recent USGS report.

Document #706 Comment #14 - response continued

In the EIS, DOE describes the potential environmental impacts of both a catastrophic and a long-term disposal cell failure under the on-site disposal alternative (see Section 4.1.17). Although there are no plausible conditions under which a catastrophic disposal cell failure could occur under this alternative, DOE assumed that such a failure would occur in order to evaluate the potential consequences.

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Document #706 Comment #15 Commentor: Fields, Sarah

DEIS (pages 4−51 to 4−56) analyses the environmental impacts of catastrophic event: "Risks to humans would be based on some type of activity that would bring people in contact with contamination. In this case, the contamination currently in the tailings pile was assumed to be dispersed downstream during an event such as a flood, and it was assumed that people would come in contact with this contamination in the water or sediments."

Comment: The impact scenarios that the DEIS discusses are totally out of touch with the reality of the use of the river as a major national recreational resource, the presence of public lands, and the desert environment. The DIES postulates a home built near the Colorado River. There are few places within the river basin below Moab where such a scenario could possibly take place.

Response:

In accordance with NEPA, DOE analyzed the potential impacts of a catastrophic event, even though DOE believes its occurrence is highly unlikely.

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Document #706 Comment #16 Commentor: Fields, Sarah

The DEIS fails to mention or address the fact that the Colorado River shortly downstream from Moab flows, without a break, through 1) Canyonlands National Park, 2) Glen Canyon National Recreation Area, 3) Grand Staircase-Escalante National Monument, and 4) the Navajo Indian Nation. The confluence of the Colorado and Green Rivers occurs within Canyonlands National Park. Most of the other lands next to the river are also in the public domain. The DEIS arbitrarily excludes consideration of impacts to the Colorado River below Glen Canyon Dam down into Mexico.

The DEIS fails to include a land use and land ownership map from Moab to the Gulf of California.

Response:

DOE did not arbitrarily exclude consideration of impacts below Glen Canyon Dam. Several sections of the EIS discuss potential impacts to the Colorado River, including the potential for catastrophic failure (see Section 4.1.17). However, the potential for a failure impacting human health and the environment is considered minimal below Glen Canyon Dam; therefore, DOE does not address land ownership from Moab to the Gulf of California. This is supported by technical and scientific data presented in the EIS.
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Document #706 Comment #17 Commentor: Fields, Sarah

The risks discussed have absolutely no relationship to the actual use by humans of the Colorado River between Moab and the Glen Canyon Dam at Page, Arizona, and beyond. The DEIS ignores the fact that the Colorado River is the 5th largest river in the United States and is the major source of drinking water, agriculture water, and recreation in the Southwest. The river provides numerous economic, social, aesthetic, and scientific resources for millions of people. Why is this not mentioned or analyzed in the DEIS?

The DEIS fails to take into consideration the recreational boating, both personal and commercial, on the Colorado. It does not identify the amount of that use, the number of trips that recreational guides take. There is no assessment of the impacts on the river-boating community by contamination from either gradual or single event scenarios, or a combination of both.

Response:

The purpose of this evaluation was to evaluate potential risks if a catastrophic failure were to occur, even though no plausible mechanism for such a failure exists. NEPA requires that the characterization of the existing environment should be commensurate with the magnitude of the potential impacts. Because the effects of site discharges, even under the No Action alternative, cannot be detected above background levels a few hundred meters downstream, there is no potential to directly affect the users identified in the comment. Therefore, the suggested characterization was considered unnecessary.
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Document #706 Comment #18 Commentor: Fields, Sarah

DEIS (page 4−51): "Other activities such as camping in a contaminated area would yield lower risks because exposure to contamination would occur for a limited number of days per year."

Comment: There is no basis for this statement. DEIS shows that there is a complete lack of data regarding the number of days any commercial recreational worker would camp on the river. The DEIS does not contain any data regarding the use of the river as a source of drinking and wash water by the river boating community, including commercial guides. There is no assessment of the amount of time boaters and guides wade in the river, are splashed by river water, are dunked by boating accidents, and would otherwise be exposed to contaminated water, contaminated sediments, and contaminated particulates.

Response:

The camping scenario assumed that camping occurs on the Moab site, where the highest contaminant concentrations would occur. The camping scenario reflects the risks associated with contaminated soils and surface water that would exist immediately adjacent to the tailings pile on the bank of the Colorado River shortly after cell failure. Two days of exposure were used because it is unlikely that any one camper would repeatedly camp at a location adjacent to the tailings pile after a failure when there are numerous, more favorable camping areas elsewhere. More favorable camping areas located downstream (including those sites that are closer to the Moab site) would have lower contaminant concentrations, thus mitigating the impact of increased usage.

DOE agrees that there is, and would likely continue to be, substantial recreational use downstream of the Moab site. However, when estimating risk, the additional use does not compensate for the significant decrease in contaminant concentrations in these downstream areas. When estimating risk, an increase in the contaminant concentration (or exposure point concentration) is directly proportional to the exposure duration. For example, the estimated dissolved uranium concentration listed in Table 4−17 for 80 percent release at the Moab site is approximately 333 times Lake Powell concentrations. For exposure pathways involving water ingestion, the exposure duration would need to be 333 times greater (666 days per year [2 days' duration for camping times 333], which is greater than the 365 days per year that are available) at Lake Powell compared to the Moab site to account for this difference in exposure point concentrations. Concentrations would begin to drop immediately downstream of the site, so this same type of effect (to a lesser degree) would also occur for camping sites closer to the Moab site. Risks from gamma exposure from these materials compared to the risks estimated in Section 4.1.17 would be minimal, mostly because the materials would mix with, or receptors would be shielded by, water and uncontaminated sediments.

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Document #706 Comment #19 Commentor: Fields, Sarah

DEIS (page 4−51): “First, it was assumed that someone would build a house on contaminated sediments released from the tailings pile at a location downstream of the pile (residential scenario). This scenario assumes a home would be built in a contaminated area and the contaminated water (in this case, contaminated surface water) would be used as the primary drinking water source for many years (in reality, the contaminant concentrations in water would only last on the order of days…”

Comment: There is no substantiation of the assumption that “the contaminant concentrations in water would only last on the order of days.” The DEIS fails to assess a circumstance where there is a continual release of contaminants into the river from the tailings, contaminated groundwater, contaminated sediments, and contaminated soils outside of the impoundment.

Response:

The purpose of this evaluation was to examine potential impacts from a large volume of tailings being washed into the Colorado River. DOE agrees that concentrations would remain somewhat elevated; however, they would continue to decrease as clean, upstream water entered this part of the watershed. Any further substantiation is not practical considering the huge uncertainties associated with this hypothetical scenario.

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Document #706 Comment #20 Commentor: Fields, Sarah

DEIS (page 4−51): “… therefore, the exposures to contaminated water under a residential scenario are unrealistically high but provide an upper bound to the potential risks). The most significant risks would occur from ingestion of contaminated drinking water and exposure to the radon in air originating from radium-226.”

Comment: There is no mention of ingestion of contamination from dust via ingestion or breathing. This significant exposure pathway is not considered here. The DEIS fails to acknowledge that contaminated areas would dry out, especially in the dry climate, and contaminated materials would then be dispersed by wind, of which there is plenty.

The DEIS fails to provide an accurate and realistic scenario regarding the potential impact to humans from contamination in and near the river corridor.

Response:

In analyzing exposure, dust is not considered to be ingested, but rather inhaled. The inhalation route is typically not as significant as ingestion of water and exposure to radon when examining radiological contaminants. Considering the very large uncertainties associated with this type of screening-level evaluation, it is appropriate to eliminate the less important routes of exposure. As noted in Section 4.1.17, even without consideration of the inhalation route, risks under the residential scenario would be greater than protective levels.

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Document #706 Comment #21 Commentor: Fields, Sarah

DEIS (page 4−51) “The camping scenario assumes two overnight camping events per year in contaminated areas and the accidental ingestion of contaminated surface water and sediments.”

Comment: There is nothing here to show that a study has been done of the overnight camping habits of commercial river personnel or other members of the public who camp, wade, and boat on the Colorado. There is no discussion of purposeful ingestion of contaminated surface water by campers and boaters. River water is often settled and used and consumed by boaters on the river.

Response:

See response to comment #18.
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Document #706 Comment #22 Commentor: Fields, Sarah

In sum, the DEIS fails to provide an accurate assessment of the potential of humans to be exposed to contaminants downstream from the Portal below the site to Lake Powell.

Response:

DOE believes that the EIS provides a reasonable evaluation of the potential consequences from this type of hypothetical catastrophic event.
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Document #706 Comment #23 Commentor: Fields, Sarah

DEIS (page 4−52): "Table 4−16 presents the estimated maximum level of contaminants in water and sediment that would still be protective of human (and ecological) health. The basis for these levels is provided in Appendix D."

Comment: The DEIS does not provide a statutory and regulatory basis for applying what the DEIS believes is the "Maximum Exposure Level of Contaminants Protective of Human Health and Ecological Resources."

The DEIS fails to provide specific information regarding the applicable state of federal regulations that would apply to the tailings and contamination from the tailings that are released from the site by a natural event. Should the tailings enter the river, they will still be "residual radioactive material," and subject to the authority of UMTRCA and EPA and possibly other state and federal regulations.

UMTRCA defines "residual radioactive material":

(7) The term "residual radioactive material" means

(A) waste (which the Secretary determines to be radioactive) in the form of tailings resulting from the processing of ores for the extraction of uranium and other valuable constituents of the ores; and

(B) other waste (which the Secretary determines to be radioactive) at a processing site which relate to such processing, including any residual stock of unprocessed ores or low-grade materials. [42 U.S.C. Sec. 7911. Definitions, at (7).]

Any discussion of the maxim levels of contaminants must be accompanied by a clear, complete discussion of ALL the Federal and State regulations that would come into play if the tailings were left in place and if the tailings and contaminated materials from the site enter the Colorado River during a natural event. The DEIS should also discuss which Federal and State statutes, regulations, and policies, that would be violated by the release of tailings and contamination from the tailings into the Colorado River. See discussion at 2.16 below.

Response:

As footnoted on Table 4−16, the bases for determining exposure concentrations are provided in Appendix A2 for each contaminant. Section 7.0 of the EIS identifies the federal and state regulations that may apply to the actions assessed in the EIS. In addition, Section 2.6.4 identifies DOE's and the State of Utah's differing opinions on applicable standards for releases to the Colorado River.
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Document #706 Comment #24 Commentor: Fields, Sarah

DEIS (page 4−52): "For the purpose of analysis, a large disposal cell failure (20 to 80 percent of the tailings eroded) was assumed to occur over a short duration (10 hours). Although such a large event would be unlikely, the analysis is useful in projecting potential environmental consequences of a worst-case scenario. The Colorado River was assumed to be at high flood stage during the tailings release. Concentrations of uranium, ammonia as nitrogen, and radium-226, the most prevalent contaminants, were estimated for the failure scenarios."

Comment: The DEIS must develop a broader, more inclusive, estimation of the release of contaminants from the impoundment. The DEIS fails to provide a scientific rationale for putting such limitations on any assessment of the impacts of a large disposal failure. There is no data to support the assumption that the release of tailings into the river would occur over a single10-hour period.

Response:

This is a highly uncertain, hypothetical bounding analysis of a future, extremely unlikely event. This type of evaluation is required under NEPA because it does help identify the differences among the alternatives. Data do not exist to support many of the assumptions in this type of evaluation, including the single 10-hour period. The assumption of a single 10-hour period is intended to represent a worst-case scenario. The impacts of slower releases over longer periods of time could probably be mitigated by future engineering controls.
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Document #706 Comment #25 Commentor: Fields, Sarah

DEIS (page 4−53): "Sediment released during a catastrophic event would deposit in the river bottom or along banks or become part of the suspended load. Fine-grained portions of the sediment would remain in suspension and rapidly transport downstream. Where the river overflowed its banks, fine-grained sediment would be deposited by settling in standing water."

Comment: Here the DEIS only evaluates the contamination and sediments that travel downstream, away from Moab site and away from the Moab Valley. This leaves out a whole area that would be impacted by the release of tailings and contaminants during a flood.

The maps contained in the recent USGS report by Terry A. Kenney (cited above) show that during flood events river water would inundate the Scott M. Matheson Wetlands Preserve (Wetlands) and parts of Moab Valley. A similar flood scenario is also postulated in the DEIS.

The DEIS fails to access the environmental impacts resulting from dispersion of contaminated water and sediments in the Wetlands or Moab Valley. This clearly contradicts the DOE's assumptions set forth elsewhere in the DEIS.

Response:

DOE cannot determine a plausible mechanism for catastrophic failure of an on-site disposal cell; the environmental consequences of such a hypothetical failure are characterized in Section 4.1.17 to support decision-making. As confirmed by the recent USGS report referenced in the comment, the velocities of a 100-year, 500-year, or even the PMF would not be sufficient to cause the catastrophic failure of the disposal cell but merely its inundation, which is evaluated in Section 4.1.3.1. The post-flood concentrations of ammonia (Section 4.1.3.1) would not be expected to exceed aquatic standards. Therefore, the Matheson Wetlands Preserve and the Moab Valley would not be impacted by floodwaters inundating the Moab pile. Therefore, in the hypothetical catastrophic failure analysis, flow into the Matheson Wetlands Preserve was not assumed.

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Document #706 Comment #26 Commentor: Fields, Sarah

DEIS (page 4−53): "The concentrations of contamination in backwater areas would depend on (1) the proportion of fine-grained tailings to clean suspended load, (2) concentration in the suspended tailings, and (3) the mass deposited over a given area. During periods of low flow, fine-grained sediment would be deposited; during high flow, these deposits would be remobilized and transported farther downstream. The sediment would be dispersed and mixed with clean sediment during transport, causing a continual decrease in contaminant load. Based on detailed studies of deposition of radioactive sediment in the Colorado River Basin, it would be expected that very small amounts of contamination would accumulate in the main river channel (HEW 1963)."

Comment: This paragraph references a June 1963 U.S. Department of Health, Education, and Welfare report, entitled "Radiological Content of Colorado River Basin Bottom, August 1960 – August 1961." The DEIS fails to address how and why this 40-year old study is in any way related to the discussion at hand. The study itself does not discuss the amount and types of contaminants that entered the Colorado River from uranium mills. They only refer to "uranium mill wastes." The study ends with a discussion of "Future Work Desired," which includes the statement, "Another aspect which deserves special consideration is a study of the distribution of dissolved radium in river water, radium in transported (or suspended) sediment, bottom sediment material and aquatic biota." It also states, "Such a study would yield additional information on the fate of radium in the water environment."

Obviously, the HEW study was not meant to be a definitive study of radium in a river environment. In the past 40 years there should be numerous studies related to the fate of radium in a water environment. The DEIS fails to make use of such studies.

Response:

The citation of the Department of Health, Education and Welfare (HEW) study is not meant to offer definitive data on the distribution of radionuclides, but only to offer some support for the concept that very fine-grained sediment (such as radioactive tailings) are likely to be distributed in overbank deposits rather than river channels. The HEW study specifically addresses the Colorado River and radionuclides and therefore was judged to be relevant.

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Document #706 Comment #27 Commentor: Fields, Sarah

DEIS (page 4−53): "The most significant mill-related contaminant in the sediment would be radium-226 because of its low tendency to partition (dissolve) in water and its abundance in the tailings (HEW 1963)."

Comment: The 1963 HEW report discusses some of the complexities related to the dissolution of radium in water. The report states that dissolution is related to the chemistry of the radium bearing material, the chemistry of the leaching liquid (i.e., river water), the amount radium in relation to the volume of the leaching liquid, agitation, a cycle of dissolution and precipitation, and time. The DEIS simplifies a very complex process. The assumption that there will be minimal dissolution of radium-226 from the impoundment is unsubstantiated.

Response:

The limiting value (no dissolution) of radium-226 is used as a worst-case scenario for estimating the impact of the suspended load. Using this value, all radium-226 is assumed to remain in the suspended load. This assumption is probably only slightly conservative because it is likely that most of the radium-226 is partitioned to the solid phase.
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Document #706 Comment #28 Commentor: Fields, Sarah

DEIS (page 4−54 to 4−56): Here, the DEIS discusses and addresses the potential adverse impacts on the environment after a catastrophic cell failure.

Comment: The DEIS acknowledges some of the many unknowns, uncertainties, and the fact that there would be long-term and short-term adverse consequences to the environment due to a catastrophic release of the tailings into the river. There is an acknowledgement that "specific impacts to endangered species are difficult to access."

The DIES presents no scientific bases for the various assumptions and "likely" scenarios related to environmental impacts of a failure of the impoundment. No study has been done that the DEIS can refer to or rely on for information regarding the significant short-term, long-term, direct, and indirect consequences of one or more releases of tailings into the Colorado River.

Response:

The introductory discussion in Section 4.1.17 (Disposal Cell Failure from Natural Phenomena) provides the assumptions DOE used to describe the expected consequences and expected risks of a catastrophic disposal cell failure. DOE believes the likelihood of such an event over the design life of an on-site disposal cell is very small. DOE also believes that the assumptions used to define and evaluate failure scenarios are both reasonable and sufficient for an evaluation of alternatives in this EIS. DOE acknowledges there are uncertainties related to the failure of the disposal cell, which are addressed in Tables S−1 and 2−33, item #10.
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Document #706 Comment #29 Commentor: Fields, Sarah

This section completely fails to acknowledge the fact that Moab and Grand County economy is a recreational tourist-based economy. Much of the recreation is associated with boating on the Colorado River. Any failure of the impoundment would have a severe negative economic impact on the local and regional community. Boating on the river downstream from the impoundment would be closed for an unknown period of time. That is, use of the Colorado River, as a navigable waterway would not be possible (impeded). The river-boating economy could be completely destroyed.

Response:

Section 3.1.18.1 does indicate that the tourism/recreation industry is the primary employer in the area. The environmental consequences of a catastrophic failure of an on-site disposal cell are described in Section 4.1.17 in order to distinguish between the on-site and off-site disposal alternatives and support decision-making. Potential human health impacts are identified. Potential socioeconomic impacts are speculative and were not included in the analysis of this highly unlikely failure scenario.
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Document #706 Comment #30 Commentor: Fields, Sarah

There is no mention of the impacts on the major downstream agricultural, drinking water, and recreational uses of the Colorado.

Response:

Section 4.1.17 of the EIS addresses the natural processes that could potentially cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks. These include impacts to downstream users, aquatic receptors, backwaters, terrestrial biota, and adjacent areas. The focus of the analysis is to evaluate the potential consequences of contaminants in the water and sediments of the Colorado River based on a significant (catastrophic) release of tailings. Although the likelihood of a significant release would be very small, this type of failure was assumed to occur in order to evaluate the potential consequences (risks).
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Document #706 Comment #31 Commentor: Fields, Sarah

There is no realistic discussion of a catastrophic tailings pile failure as a National Disaster.

Response:

In the EIS, DOE describes the potential environmental impacts of both a catastrophic and a long-term disposal cell failure under the on-site disposal alternative (see Section 4.1.17). Although there are no plausible conditions under which a catastrophic disposal cell failure could occur under this alternative, DOE assumed that such a failure would occur in order to evaluate the potential consequences. Whether such a failure would be considered a national disaster is not relevant to the identification of potential impacts.
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Document #706 Comment #32 Commentor: Fields, Sarah

The adverse impacts to the Wetlands and Moab Valley by a catastrophic failure of the tailings are completely ignored. Right now, DEIS answers to questions related to the environmental impacts of "Disposal Cell Failure from Natural Phenomena" are by-guess-and-by-golly.

These significant impacts demand a detailed and comprehensive study.

Response:

The catastrophic failure analyses (Section 4.1.17) were done as a screening tool to inform decision-makers of the possible differences among the on-site and off-site disposal alternatives, even though DOE believes that there are no plausible mechanisms for such a failure.

Because the catastrophic flood is assumed to occur, even though such an event is not plausible, no attempt was made to postulate the effect such a flood would have on the rest of Moab Valley. The EIS analyses are based on sound assumptions and valid calculations sets generated by credentialed scientists and engineers with many years of experience at other UMTRCA sites.
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Document #706 Comment #33 Commentor: Fields, Sarah

DEIS (page 4−55): “If mitigated, long-term failure would not likely result in negative impacts to aquatic biota. This type of release, which is possible at all UMTRCA Title I sites, can be mitigated. DOE’s newly created (2003) Office of Legacy Management is responsible for monitoring and mitigating this type of release.”

Comment: Here the DEIS does acknowledge the DOE’s responsibility for mitigation of impact from a release of tailings into the river environment. However, there is no actual assessment of the types of mitigation required, the clean-up standards to be applied, costs, the possibility that mitigative measures would not be possible or would be ineffective, etc.

The DEIS states that this type of release “is possible at all UMTRCA Title I sites.” No data is given to support this false, misleading, inaccurate statement.

Mill tailings at other similar Title I sites have been removed from the floodplain of their respective rivers. Some of the Title I sites were not even located on a river in the first place. It is impossible for the tailings at other Title I sites to be released into the Colorado River or one of it’s tributaries by a catastrophic flood or river meander. The Colorado River is the 5th largest river in the United States. There is no other comparable Title I situation.

Response:

The mitigation referred to in Section 4.1.17 would include a barrier wall to further reduce the already low likelihood of impacts from river migration and slide slope armaments on the on-site disposal cell to mitigate impacts from flood erosion (discussed in Section 2.1.3.1). It is DOE’s opinion that no plausible mechanism exists to induce a catastrophic failure. However, to support comparison among alternatives, the accident is assumed to occur and the consequences are characterized. To further attempt to quantify the cleanup of a highly unlikely event would be so speculative as to be meaningless. Although some UMTRCA sites were or are still located in floodplains, it was imprecise to imply that a catastrophic failure and associated release to a river environment was or is possible at all UMTRCA Title I sites; therefore, the phrase has been deleted from Section 4.1.17.
==

Document #706 Comment #34 Commentor: Fields, Sarah

Requirements of NEPA and CEQ Regulations

CEQ regulations that were promulgated in response NEPA are found at 40 C.F.R. §§ 1500-1508. These regulations set forth the requirements for draft EISs. Below is a discussion of how DEIS Section 4.1.17 meets, or fails to meet, some of the CEQ and NEPA requirements.

CEQ regulation that implement the procedural provisions of NEPA demands that the requirements of other environmental laws and policies that are applicable to the deposition of tailings and contaminated materials from the tailings into the Colorado River be addressed in the DEIS. See 40 C.F.R. § 1501.2, “Implementation.”

Document #706 Comment #34 - continued

CEQ regulation also demands that the agency address “whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.” See 40 C.F.R. § 1508.27(b)(10).

This section of the DEIS does not provide such a discussion. The DEIS does not address the federal and state statures and regulations are pertinent to the environmental impacts of a failure of the Moab Mill tailings impoundment. The DEIS does not address the possibility of the violation of other Federal, State, or local laws or regulations due to the presence of the tailings on the floodplain of a navigable water or the release of the tailings into such water, which includes nearby wetlands.

Some of applicable Federal and State regulations and statutes that should be addressed in any assessment of impacts from “Disposal Cell Failure from Natural Phenomena” are:

a. The Rivers and Harbors Act of 1899, Section 13, 1899 Rivers and Harbors Act (42 U.S.C. Title 33, Chapter 9, Section 407), which prohibits 1) the discharge of refuse matter of any kind or description whatever from the shore or mill into any navigable water and prohibits 2) material of any kind to be deposited on the bank of any navigable water where it shall be liable to be washed into such navigable water by storms or floods, or otherwise, whereby navigation shall or may be impeded or obstructed.

b. Utah State Clean Water Act Implementing Regulations (UAC. R317-2-13). The State of Utah is authorized to protect the Colorado River as a raw water source and for recreation, boating, wading, game fish, aquatic life, and agricultural use.

c. Endangered Species Act of 1973 (PL 93-205, 87 Stat 884, 7 USC 136, as amended)

d. Federal Water Pollution Control Act (Clean Water Act of 1972) (PL 92-500, PL 100-433, 86 Stat 816, USC 9 sec. 1251 et seq., as amended, 33 USC sec. 1251-1356, and 1987 Federal Water Quality Act)

e. Emergency Planning and Community Right-to-Know Act (PL 99-499 Title III of SARA

f. Federal Tort Claims Act (PL chapter 753 Title IV, 60 Stat 842, 28 USC 1346b, 2671-80)

g. Federal Water Pollution Control Act (Clean Water Act of 1972) (PL 92-500, PL 100-433, 86 Stat 816, USC 9 sec. 1251 et seq., as amended, 33 USC sec. 1251-1356, and 1987 Federal Water Quality Act)

h. National Park Service Organic Act of 1916 (PL Chapter 408, 39 Stat 535 et seq., 16 USC 1)

i. Historic Sites, Buildings and Antiquities Act of 1935 (PL Chapter 593, 49 Stat 666, 16 USC 461 et seq.)

Document #706 Comment #34 - continued

j. Protection of Wetlands (E.O. 11990, 1977 42 FR 26961, 3 CFR 121 (Supp 177), 42 USC 4321)

k. Indian Sacred Sites* (E.O. 13007, 61 FR 26771)

Response:

DOE is not proposing to discharge (as defined by the cited regulations) any material into the Colorado River as part of any alternative. For purposes of analysis, DOE did evaluate a catastrophic failure of a disposal cell under the on-site disposal alternative, although there are no plausible circumstances under which such a failure could occur. For this reason, DOE did not address, and is not required to address, violations of laws that might apply at the time a hypothetical failure might occur. As explained in Section 1.6 of the EIS, DOE entered into agreements with 12 federal, state, tribal, county, and local agencies to be cooperating agencies in the development and preparation of the EIS. To the fullest extent possible, DOE has engaged the cooperating agencies that have responsibility for enforcing many of the laws cited in the comment (for example, the USF&WS for endangered species, the State of Utah for water quality issues, and the Ute Mountain Ute Tribe for matters potentially affecting Indian sacred sites). In accordance with CEQ and DOE regulations, the EIS identifies federal and state regulations that might apply to the proposed actions analyzed in the EIS.
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Document #706 Comment #35 Commentor: Fields, Sarah

CEQ regulation requires that the DEIS shall include discussions of “direct effects and their significance” and “indirect effects and their significance.” As shown above, this section did not provide a full discussion of the direct and indirect effects and their significance related to a failure of the impoundment. Too many of the effects were minimized or completely ignored . See 40 C.F.R § 1502.16 (Environmental consequences) (a) and (b).

Response:

In the EIS, DOE describes the potential environmental impacts of both a catastrophic and a long-term disposal cell failure under the on-site disposal alternative (see Section 4.1.17). Although there are no plausible conditions under which a catastrophic disposal cell failure could occur under this alternative, DOE assumed that such a failure would occur in order to evaluate the potential consequences. The potential environmental impacts analyzed are those to human health and safety and to biological resources. The commentor does not identify other direct or indirect effects that should have been addressed.
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Document #706 Comment #36 Commentor: Fields, Sarah

CEQ regulation requires that the DEIS address the possible conflicts between leaving the tailings in place, with the potential of adverse impact from an impoundment failure, and the "objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned." The DEIS failed to mention, let alone address, pertinent objectives of Federal, State, local, tribal, and regional "land use plans, policies and controls for the area concerned." This is especially pertinent because the land that would be impacted by a failure of the impoundment at Moab, in land that belongs to Federal and Tribal governments. See 40 C.F.R § 1502.16 (c).

Response:

Because the likelihood of a catastrophic failure of a disposal cell under the on-site disposal alternative is so remote, DOE believes that it would be speculative to attempt to address how such a failure might affect federal, regional, state, local, or tribal land use plans, policies, and controls in effect at the time such a failure might occur. In addition, a long-term, slow-release disposal cell failure could be mitigated in order to avoid such effects. Also see response to comment #35.
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Document #706 Comment #37 Commentor: Fields, Sarah

CEQ regulation requires that the DEIS consider "urban quality" and "historic and cultural resources" in the evaluation of the environmental consequences. The DEIS failed to identify and address the impacts to the urban Grand County community environmental and quality of life in the event of a disposal cell failure. The DEIS failed to address impacts on the historic and cultural resources on the Colorado River downstream from the Moab site that could be impacted by disposal cell failure. There are numerous cultural resources in the vicinity of the river downstream. These are neither identified nor addressed. See 40 C.F.R § 1502.16(g).

Response:

The potential environmental impacts analyzed are those to human health and safety and to biological resources. Because the likelihood of a catastrophic failure of a disposal cell under the on-site disposal alternative is so remote, DOE believes that it would be speculative to attempt to address how such a failure might affect the urban community or historic and cultural resources in existence at the time such a failure might occur. In addition, a long-term, slow-release disposal cell failure could be mitigated in order to avoid such effects. Also see response to comment #35.
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Document #706 Comment #38 Commentor: Fields, Sarah

CEQ regulation requires that the DEIS address the means to mitigate adverse environmental impacts. This assumes that the adverse impacts are completely and accurately identified. This has not been done in this section. The DEIS does not state the extent of DOE responsibility for the contamination from the release of tailings from the site into the river. There is no discussion of exactly what could be done to clean up the contaminated river and wetland environment in the event of the dispersal of tailings and contamination in the Moab Valley and downstream. The DEIS does not state how the DOE would rectify the impact from a tailings impoundment failure by repairing, rehabilitating, or restoring the affected environment. See 40 C.F.R § 1502.16(h).

Response:

The potential environmental impacts analyzed are those to human health and safety and to biological resources. The likelihood of a catastrophic failure of a disposal cell under the on-site disposal alternative is extremely remote; therefore, DOE believes that it would be speculative to attempt to address the extent of DOE's responsibility for the resulting contamination or cleanup, or of the cleanup methods that could be used at the time such a failure might occur. Also see response to comment #35.
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Document #706 Comment #39 Commentor: Fields, Sarah

CEQ regulation requires that "agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements." It requires that agencies "identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement." In this section the DOE did not meet this requirement. The various assumptions, hypotheses, and conclusions are not footnoted and there are numerous inaccurate, incomplete, and unsubstantiated statements. See 40 C.F.R. § 1502.24 (Methodology and scientific accuracy).

Response:

The commentor does not identify any specific statements that are "inaccurate, incomplete, and unsubstantiated" or why. Each EIS chapter lists the references used in the development of information in that chapter. In addition, the EIS includes numerous appendixes that explain the analysis methodologies.
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Document #706 Comment #40 Commentor: Fields, Sarah

CEQ regulation also says that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. There is no such an analysis in the DEIS related to a tailings impoundment failure. There is no recognition that such a failure would constitute "National Disaster." See 40 C.F.R. § 1508.27(a).

Response:

In the EIS, DOE describes the potential environmental impacts of both a catastrophic and a long-term disposal cell failure under the on-site disposal alternative (see Section 4.1.17). Although there are no plausible conditions under which a catastrophic disposal cell failure could occur under this alternative, DOE assumed that such a failure would occur in order to evaluate the potential consequences. The potential environmental impacts analyzed are those to human health and safety and to biological resources. The analyses do not support the commentor's assertion that a catastrophic failure would be on the scale of a national disaster.

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Document #706 Comment #41 Commentor: Fields, Sarah

"Significantly as used in NEPA requires considerations of both context and intensity." See 40 C.F.R. § 1508.27(b)(1) to (10). Intensity means the severity of impact. NEPA requires that the following should be considered in evaluating intensity:

(a) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

(b) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

(c) The degree to which the possible effects on the human environment is highly uncertain or involves unique or unknown risks.

(d) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

(e) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

In the discussion of the impacts of a significant release of the tailings, the DEIS failed to be considered these aspects in evaluating intensity of the environmental consequences.

Response:

In the EIS, DOE describes the potential environmental impacts of both a catastrophic and a long-term disposal cell failure under the on-site disposal alternative (see Section 4.1.17). Although there are no plausible conditions under which a catastrophic disposal cell failure could occur under this alternative, DOE assumed that such a failure would occur in order to evaluate the potential consequences. The potential environmental impacts analyzed are those to human health and safety and to biological resources. Because the likelihood of a catastrophic failure of a disposal cell under the on-site disposal alternative is so remote, DOE believes that it would be speculative to attempt to address the elements noted by the commentor.
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Document #706 Comment #42 Commentor: Fields, Sarah

Regulatory Requirements

Section 7 (pages 7−1 to 7−9) of the DEIS sets forth various statutes, regulations, executive orders, and policy guidances that the DOE believes are applicable to the Moab Mill Project.

DEQ NEPA regulation at 40 C.F.R. § 1502.2(d) requires that “environmental impact statements shall state how alternatives considered in it and decisions based on it will or will not achieve the requirements of sections 101 and 102(1) of [NEPA] and other environmental laws and policies.” See 40 C.F.R. § 1501.2, (Implementation). However, there is no section of the DEIS that addresses the applicability of NEPA and the other laws and policies to specific alternatives. Any discussion of regulatory requirements is scattered within the document and difficult to find.

NEPA also demands that the agency address “whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.” See 40 C.F.R. § 1508.27(b)(10). There is no such discussion in the DEIS.

Response:

The EIS overall addresses the potential environmental impacts of the on-site and off-site disposal alternatives and the No Action alternative. Within the document, DOE addresses the potential impacts of each alternative on geology and soils, air quality, ground water, surface water, floodplains and wetlands, aquatic ecology, terrestrial ecology, land use, cultural resources, noise and vibration, visual resources, infrastructure, solid waste management, socioeconomics, human health, traffic, and environmental justice. The EIS also describes the potential environmental consequences of a disposal cell failure under the on-site disposal alternative and the No Action alternative. DOE believes that it has fully complied with Sections 101 and 102 of NEPA and all aspects of the CEQ and DOE NEPA regulations.

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Document #706 Comment #43 Commentor: Fields, Sarah

Section 7.1.7 (page 7−4) discusses the Clean Water Act. It states that “mill tailings are exempt from the definition of a pollutant,” and implies that the Clean Water Act is not applicable to the tailings and any discharges from the tailings into ground and surface water, implying that the Moab Mill tailings are exempt from Clean Water Act regulations. The DEIS fails to provide a basis for this pollutant exemption.

The applicable EPA definition of “pollutant” under the Clean Water Act regulations is found at 40 C.F.R. § 122, entitled “EPA Administered Permit Programs: The National Pollutant Discharge Elimination System,” Subpart A (“Definitions and General Program Requirements”). The DEIS references these EPA regulations, which are part of the EPA implementation of the Clean Water Act. Section 122.2, entitled “Definitions,” states, in pertinent part:

Sec. 122.2 Definitions.

Document #706 Comment #43 - continued

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, **radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.))**, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

Note: Radioactive materials covered by the Atomic Energy Act are those encompassed in its definition of source, byproduct, or special nuclear materials. Examples of materials not covered include radium and accelerator-produced isotopes. See Train v. Colorado Public Interest Research Group, Inc., 426 U.S. 1 (1976). [Emphasis added.]

First, the definition of pollutant says that it includes "radioactive materials (except those regulated under the Atomic Energy Act of 1954 (AEA), as amended (42 U.S.C. 2011 et seq.))." Next, the definition provides a note of clarification: "Radioactive materials covered by the Atomic Energy Act are those encompassed in its definition of source, byproduct, or special nuclear materials." It also states that materials not covered by the AEA "include radium."

According to the DEIS, the AEA requirements for the Moab Mill Tailings are found at 42 U.S.C., Chapter 88 ("Uranium Mill Tailings Radiation Control"), §§ 7901 et seq. These regulations apply to UMTRCA Title I inactive mill tailings sites, such as the Moab Mill Project site. These inactive sites are the responsibility of the DOE. Congress amended the AEA in October 2000 and designated the Moab Mill site as a Title I site under UMTRCA. See the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law No. 106-398). Because of that authorization act, the Moab Mill tailings are no longer regulated under 42 U.S.C. §§ 2021 et seq., which provides for (among other things) regulation of commercial uranium and thorium processing sites by the NRC and Agreement States.

Sec. 7911. Definitions

(7) The term "residual radioactive material" means

(A) waste (which the Secretary determines to be radioactive) in the form of tailings resulting from the processing of ores for the extraction of uranium and other valuable constituents of the ores; and

(B) other waste (which the Secretary determines to be radioactive) at a processing site which relate to such processing, including any residual stock of unprocessed ores or low-grade materials.

Under the provisions of Title I, the Moab Mill tailings now fall within the definition of "residual radioactive material." They no longer fall under the definitions of source, byproduct, or special nuclear materials found in 42 U.S.C. Chapter 23. (It might be argued that the tailings contain "source material" and, thus, are exempt from the definition of "pollutant." However, that would only exempt the radioactive uranium portion of the tailings, not the other radioactive

Document #706 Comment #43 - continued

(e.g., radium-226), toxic, and hazardous constituents of the tailings and ground and surface water contamination from the tailings. The DOE has authority under Title I for "residual radioactive material," but not for "source material.")

There is no indication that the EPA has exempted "residual radioactive materials," or radioactive materials "regulated" under Sections 7901 et seq. of 42 U.S.C., from the regulatory definition of the term "pollutant."

The DEIS should clarify this matter of statutory authority under the Clean Water Act, with cites.

Response:

Residual radioactive material is exempt from the definition of a pollutant under 40 CFR 122.2 and also under UAC R317-8 (1.5). This interpretation was upheld by the U.S. 9th Circuit Court of Appeals (Waste Action Project v. Dawn Mining Corporation, February 4, 1998). However, DOE has consistently taken the position at UMTRCA Title I sites, including Moab, that although the site is exempt from this requirement of the Clean Water Act, DOE is committed to working with federal, state, and local regulatory agencies to protect human health and the environment. DOE has demonstrated that commitment since assuming management of the Moab site in October 2003; examples include implementing interim actions to control surface water contamination and maintaining ongoing consultation with the USF&WS.
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Document #706 Comment #44 Commentor: Fields, Sarah

Section 7.1.8 (page 7−4) discusses the applicability of the Rivers and Harbors Act of 1899 (RHA). The only section discussed is Section 10. There is no mention of Section 13 of the RHA, sometimes known as the "Refuse Act" (42 U.S.C. Title 33, Chapter 9, Section 407). This is strange, because in the scoping process, I submitted an extensive comment regarding the applicability of this statute to the Moab Mill situation. Further, this issue is not listed in the DEIS under "Issues/Concerns Raised in the Scoping" (Section 1.5.2, pages 1−13 to1−20).

Section 13 of the RHA, entitled "Deposit of refuse in navigable waters generally," reads:

It shall not be lawful to throw, discharge, or **deposit**, or cause, **suffer**, or procure to be thrown, discharged, or Deposited either from or out of any ship, barge, or other floating craft of any kind, **or from the shore**, wharf, manufacturing establishment, **or mill of any kind, any refuse matter of any kind or description whatever** other than that flowing from streets and sewers and passing therefrom in a liquid state, **into any navigable water of the United States**, or into any tributary of any navigable water **from which the same shall float or be washed into such navigable water**; and it shall not be lawful to deposit, or cause, suffer, or procure to be deposited material of any kind in any place on the bank of any navigable water, or on the bank of any tributary of any navigable water, where the same shall be liable to be washed into such navigable water, either by ordinary or high tides, or by **storms or floods**, or otherwise, **whereby navigation shall or may be impeded or obstructed**: Provided,

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That the Secretary of the Army, whenever in the judgment of the Chief of Engineers anchorage and navigation will not be injured thereby, may permit the deposit of any material above mentioned in navigable waters, within limits to be defined and under conditions to be prescribed by him, provided application is made to him prior to depositing such material; and whenever any permit is so granted the conditions thereof shall be strictly complied with, and any violation thereof shall be unlawful. [Emphasis added.]

The pertinent provisions of this statute read:

1) It shall not be lawful to discharge, or deposit, or cause, suffer, or procure to be deposited from the shore or mill of any kind any refuse matter of any kind or description whatever into any navigable water of the United States from which the same shall float or be washed into such navigable water; and

2) It shall not be lawful to deposit, or cause, suffer, or procure to be deposited material of any kind in any place on the bank of any navigable water where the same shall be liable to be washed into such navigable water by storms or floods, or otherwise, whereby navigation shall or may be impeded or obstructed.

With respect whether the Colorado River in the vicinity of the Moab Mill is a “navigable water,” the U.S. Army Corps of Engineers informed the DOE that “the [Moab Mill] project site is also located within a declared navigable reach of the Colorado.” See letter from Ken Jacobson, Chief, Colorado/Gunnison Basin Regulatory Office, Grand Junction, Colorado, U.S. Army Engineer District—Sacramento, Department of Army, to Joel Berwick, Grand Junction Office, DOE, August 14, 2003; Attachment 2 to “Migration Potential of the Colorado River Channel Adjacent to the Moab Project Site: Letter Report,” MOA 19.1.2, November 2003, Rev. 2.

The DEIS should contain a full, authoritative discussion of the applicability of both Section 13 prohibitions to the Moab Mill site. This statute should be addressed pursuant to the requirements of 40 C.F.R. § 1502.2(d) and 40 C.F.R. § 1508.27(b)(10).

Response:

DOE is not proposing to discharge any material into the Colorado River as part of any alternative. For purposes of analysis, DOE did evaluate the catastrophic failure of a disposal cell under the on-site disposal alternative, although there are no plausible circumstances under which such a failure could occur. For this reason, DOE did not address, and is not required to address, violations of laws that might apply at the time a hypothetical failure might occur.
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Document #706 Comment #45 Commentor: Fields, Sarah

Section 7.3.1 (page 7−8) Discusses the State of Utah Clean Water Act Implementing Regulations found in the Utah Administrative Code (U.A.C.) Section R317-2-13 (Water Quality Standards).

This very short section indicates that the Colorado River is protected by the State as a raw water source, for boating, wading, water skiing, warmwater game fish and necessary aquatic organisms in their food chain, and agricultural uses.

But, contrary to the requirements of 40 C.F.R. § 1502.2(d) and 40 C.F.R. § 1508.27(b)(10), the DEIS fails to "state how alternatives considered in it and decisions based on it will or will not achieve the requirements of" R317-2-13. Additionally, contrary to the requirements of 40 C.F.R. § 1508.27(b)(10), the DEIS fails to address whether the current situation or any of the proposed alternatives threaten a violation of R1317-2-13.

The DOE must implement these CEQ requirements in all respects.

Response:

DOE and the state disagree on the applicability of state ground water standards to remediation of the Moab site. The views of both entities are provided in Section 2.6.4 in accordance with CEQ's requirements.
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Document #706 Comment #46 Commentor: Fields, Sarah

The DEIS fails to list and address other requirements that would be violated or would in some way be applicable in the event of a catastrophic failure of the tailings impoundment. These would include the Emergency Planning and Community Right-to-Know Act (PL 99-499 Title III of SARA Sec. 300-330, 100 Stat 1725, 42 USC 1101), the Federal Tort Claims Act (PL chapter 753 Title IV, 60 Stat 842, 28 USC 1346b, 2671-80), and the National Park Service Organic Act of 1916 (PL Chapter 408, 39 Stat 535 et seq., 16 USC 1).

Response:

For purposes of analysis, DOE did evaluate the catastrophic failure of a disposal cell under the on-site disposal alternative, although there are no plausible circumstances under which such a failure could occur. For this reason, DOE did not address, and is not required to address, violations of laws that might apply at the time a hypothetical failure might occur.
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Document #706 Comment #47 Commentor: Fields, Sarah

CEQ regulation at 40 C.F.R. § 1502.16(c) requires that the DEIS address “possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.” The DEIS discussion of Regulatory Requirements fails to identify and address specific objectives of Federal, regional, State, and local, tribal land use plans, policies and controls” for the impacted areas of concern. Further, there is no such discussion elsewhere in the DEIS.

Response:

The UMTRCA specifies that mill tailings shall be remediated to protect human health and the environment. DOE solicited the participation of several cooperating agencies at the federal, state, and local levels to ensure that conflicts were identified and, to the extent practicable, resolved prior to issuing the draft EIS to the public for comment. Based on communications with these agencies, DOE determined that the Klondike Flats and Crescent Junction sites are located in areas consistent with the Federal Land Policy and Management Act and BLM resource management plans. The Moab site is currently owned and managed by DOE, and the White Mesa Mill site is owned and operated by IUC. All these considerations, including potential conflicts with haul routes and borrow areas, are addressed in the EIS.
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Document #706 Comment #48 Commentor: Fields, Sarah

Section 7.1.2 (pages 7−1 to 7−3) addresses the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). Unfortunately, this section also includes the implementing EPA regulations, rather that providing a separate section for the discussion of 40 C.F.R. Part 192, Subparts A, B, and C. The DEIS mixes the provisions of Title I of UMTRCA with the applicable provisions of Part 192.

Neither the discussion of Title I nor the discussion of applicable subparts of 40 C.F.R. Part 192 state how alternatives considered in the DEIS and decisions based on the DEIS will or will not achieve the requirements of UMTRCA and Part 192. This is contrary to the expectation set forth in 40 C.F.R. § 1502.2(d).

Response:

The compliance goals against which all alternatives are compared throughout the EIS are derived from 40 CFR 192 or other applicable standards.
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Document #706 Comment #49 Commentor: Fields, Sarah

In sum, the DEIS discussion of Regulatory Requirements, itself, fails to meet the regulatory requirements set forth in the applicable CEQ regulations implementing NEPA.

Further, DOE NEPA regulations state that, “to the extent possible, DOE shall determine the applicability of other environmental requirements early in the planning process, in consultation with other agencies when necessary or appropriate, to ensure compliance and to avoid delays.” See 10 C.F.R. § 1021.341 (Coordination with other environmental review requirements). As shown above, this directive was not fully implemented.

The CEQ regulations were promulgated for a reason. It was the intent of the NEPA and the CEQ that all significant circumstances affecting a major federal action be considered by the public and the agency. When an agency leaves pertinent information out of a DEIS, it limits the ability of the public and the agency to make sound environmental decisions. This is especially relevant in these circumstances, where there has been a massive failure of the regulatory oversight process since 1956. Fifty years of unsound Moab Mill decision making with respect the protection of the environment and the health and safety of the workers and the public is an unfortunate heritage. It is not a heritage to build on.

Response:

As explained in Section 1.6 of the EIS, DOE entered into agreements with 12 federal, state, tribal, county, and local agencies to be cooperating agencies in the development and preparation of the EIS. See response to comment #42.
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Document #706 Comment #50 Commentor: Fields, Sarah

White Mesa Alternative

It was not until less than two weeks ago, at my request, that the DOE made one of the important documents related to the White Mesa proposal publicly available and placed it in the DOE reading files in Grand and San Juan Counties. The International Uranium (USA) Corporation (IUSA) report, Preliminary Cost Estimate and Technical Report: Moab Tailings Project White Mesa Slurry Pipeline Option. May 9, 2003, is a large document that, according to law, should have been made available to the public last May.

Although the DEIS discussion of the White Mesa Alternative is, in part, based on that submittal, it is not referenced in the DEIS. The failure of the DOE to make this record publicly available was a clear violation of the AEA (42 U.S.C. Chapter 88, § 7924(e); UMTRCA, Section 114(e), Documentation of information; public availability; trade secrets and other disclosure exempt information). Section 7924(e) states:

The Commission, in cooperation with the Secretary, shall ensure that any relevant information, other than trade secrets and other proprietary information otherwise exempted from mandatory disclosure under any other provision of law, obtained from the conduct of each of the remedial actions authorized by this subchapter and the subsequent perpetual care of those residual radioactive materials is documented systematically, and made publicly available conveniently for use.

The Final EIS should include in its discussion of the White Mesa alternative the applicable references to the 2003 Preliminary Cost Estimate and Technical Report and other IUSA documents, with "explicit reference by footnote," as required by 40 C.F.R. § 1502.24.

Response:

The IUC report mentioned in the comment was placed in the reading rooms after proprietary information was deleted. Because DOE performed its own independent evaluation of the White Mesa Mill alternative, the IUC report was not used as a reference and, therefore, was not included in the list of references.
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Document #706 Comment #51 Commentor: Fields, Sarah

The DEIS sheds little light on the process that resulted in the White Mesa proposal appearing as a viable remedial action alternative.

Response:

The EIS identifies the White Mesa Mill alternative as a reasonable alternative under NEPA that could meet the requirements of 40 CFR 192. It is considered a reasonable alternative for three main reasons: it is technically feasible; it could provide the benefit of co-location of uranium mill tailings wastes; and the associated impacts may have the potential to be mitigated in an acceptable manner.
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Document #706 Comment #52   Commentor: Fields, Sarah

It is unclear whether IUSA is acting as an applicant or as a potential future contractor to the DOE, and how, specifically, the IUSA proposal fits into the regulatory scheme of things under UMTRCA and other applicable DOE regulations related to applicants and contractors. This aspect of the IUSA proposal should be outlined in the DEIS, rather than hidden from the public.

Response:

The proposal to which the commentor refers was submitted in response to a public solicitation from DOE for proposals on disposal options as part of a preliminary scoping effort to assist the DOE in identifying the range of reasonable alternatives. Final decisions on the contractual mechanisms that would be applied to the White Mesa Mill alternative would be determined as part of DOE's final decision-making process if this alternative were selected.
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Document #706 Comment #53 Commentor: Fields, Sarah

The DEQ NEPA regulations include provisions that apply to "applicants," which IUSA appears to be. IUSA did submit a substantive proposal to the DOE and that proposal was accompanied by environmental information: Description of the Affected Environment, White Mesa Mill, Blanding, Utah, for Transport by Slurry Pipeline and Disposal of the Moab Tailings, May 2003.

40 C.F.R. § 1506.5 (Agency responsibility), states at (a):

(a) Information. If an agency requires an applicant to submit environmental information for possible use by the agency in preparing an environmental impact statement, then the agency should assist the applicant by outlining the types of information required. The agency shall independently evaluate the information submitted and shall be responsible for its accuracy. If the agency chooses to use the information submitted by the applicant in the environmental impact statement, either directly or by reference, then the names of the persons responsible for the independent evaluation shall be included in the list of preparers (Sec. 1502.17). It is the intent of this paragraph that acceptable work not be redone, but that it be verified by the agency.

There is no specific reference to this requirement in the DEIS. The DOE did use the information submitted by IUSA in the DEIS and, however vaguely, did reference that document. However, there is no indication that the DOE independently evaluated and verified the information in that IUSA submittal. The DEIS does not indicate that the DOE is responsible for its accuracy. The DEIS does not list the preparers of the Description of the Affected Environment in the list of DEIS preparers in Section 8 of the DEIS.

The status of IUSA as an "applicant," the relationship of the IUSA environmental report to the DEIS, and the applicability of the requirements of 40 C.F.R. § 1506.5(a) should be clarified by the DOE.

Response:

IUC's proposal was placed in the reading rooms after proprietary information was deleted. Because DOE performed its own independent evaluation of the White Mesa Mill alternative, the IUC report was not used as a reference and, therefore, was not included in the list of references. As the issuing agency for the EIS, DOE is responsible for the accuracy of its contents. Preparers of the EIS are listed in Chapter 8.0.

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Document #706 Comment #54 Commentor: Fields, Sarah

Section 2 of the DEIS is supposed to contain a Description of Proposed Alternative Action. However, there is not a full description of any of the off-site disposal alternatives. The description of those alternatives is scattered throughout this section.

Information regarding the White Mesa slurry pipeline alternative is presented on pages 2−34, 2−46, 2−56, 2−59, 2−61 to 2−66, 2−78 to 2−83, and then some. It is very hard for a reviewer of the DEIS to get a complete, comprehensive picture of the totality of the White Mesa alternative or the two other off-site disposal alternatives.

The DEIS should be rearranged to include a descriptive section for each off-site alternative in Section 2. All this descriptive information for each alternative should be in one place. Section 2 is very confusing.

Response:

DOE recognizes that the combination of four disposal site alternatives, three transportation modes, active ground water remediation, and the No Action alternative makes this EIS complex. DOE decided that the format developed for the EIS is the most effective means to communicate these proposed actions.
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Document #706 Comment #55 Commentor: Fields, Sarah

Section 1.4.2 (page 1−8) introduces the White Mesa proposal. It states that the Mill has the potential to process material from the Moab site.” Neither here, nor in subsequent DEIS discussion of the possibility of the processing of slurry water or tailings, is there any mention of necessary findings by the Secretary of Energy that are required prior to the processing of any Moab materials at White Mesa. The specific provisions set forth in UMTRCA related to such processing are not included in the DEIS discussion. Here the applicable statute is found at 42 U.S.C. Sec. 7918(b), which states:

(b) Mineral concentration evaluation; terms and conditions for mineral recovery; payment of Federal and State share of net profits; recovery costs; licenses

Prior to undertaking any remedial action at a designated site pursuant to this subchapter, the Secretary shall request expressions of interest from private parties regarding the remilling of the residual radioactive materials and the site and, upon receipt of any expression of interest, the Secretary shall evaluate among other things the mineral concentration of the residual radioactive materials at each designated processing site to determine whether, as a part of any remedial action program, recovery of such minerals is practicable**. The Secretary, with the concurrence of the Commission, may permit the recovery of such minerals, under such terms and conditions as he may prescribe to carry out the purposes of this subchapter.** No such recovery shall be permitted unless such recovery is consistent with remedial action. Any person permitted by the Secretary to recover such mineral shall pay to the Secretary a share of the net profits derived from such recovery, as determined by the Secretary**. Such share shall not exceed the total amount paid by the Secretary for carrying out remedial action at such designated site. After payment of such**

Document #706 Comment #55 - continued

share to the United States under this subsection, such person shall pay to the State in which the residual radioactive materials are located a share of the net profits derived from such recovery, as determined by the Secretary. **The person recovering such minerals shall bear all costs of such recovery.** Any person carrying out mineral recovery activities under this paragraph shall be required to obtain any necessary license under the Atomic Energy Act of 1954 [42 U.S.C. 2011 et seq.] or under State law as permitted under section 274 of such Act [42 U.S.C. 2021]. [Emphasis added.]

This statute related to recovery of minerals from "residual radioactive material" by a Title II licensee requires various findings by the Secretary of Energy.

There is no indication that the Secretary has made the required findings related the processing of Moab tailings or slurry water by IUSA. There is no indication that the Secretary has evaluated the mineral concentration of the residual radioactive materials at the Moab site, determined whether mineral recovery is practicable and consistent with remedial action, or has determined the share of the net profits that should to the Secretary.

The DEIS's failure to include this pertinent information is consistent with the DEIS's failure, described above, to include specific information regarding the implementation of applicable statute, as required.

Response:

In 2002, DOE solicited ideas on the Moab remediation through the issuance of a Federal Business Opportunities announcement. The announcement met the requirement for soliciting reprocessing interest. No party responding to the announcement expressed an interest in reprocessing. Further, in the early days of the UMTRA Title I surface remedial action project, DOE made public an expression of interest from private parties regarding the remilling of the residual radioactive materials, and no action was taken on the request to reprocess the tailings at the 24 sites. DOE has recently reviewed the economic viability of reprocessing the tailings; the calculation results conclude that reprocessing is not economically viable using conventional milling technology.

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Document #706 Comment #56 Commentor: Fields, Sarah

Section 3.4.11 (pages 3−155 to 3−157) discusses Cultural Resources at the IUSA Mill.

The discussion of the adverse impacts to the cultural resources in Section 4.4.9 (pages 4−135 to 4−138) reference the 2003 Class I Cultural Resource Inventory of the Proposed White Mesa Mill Site, White Mesa Mill Materials Borrow Area, and Two Associated Corridor Routes, Grand and San Juan Counties, Utah, Abajo Archeology, Bluff, Utah. There is no mention in the DEIS that this document is not publicly available. Apparently, no attempt was made to make a copy that did not contain sensitive information available to the public. 40 C.F.R. § 1502.21 states, "No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment."

Document #706 Comment #56 - continued

Section 3.4.11 states that the various sections of land on White Mesa, however there is no mention of Section 16, Township 38 South, Range 22 East. Since this section contains IUSA's proposed borrow area, I would think that that area would be included in the study.

The information in this discussion of cultural resources is minimal and in no manner informs the reader of the types of cultural sites that would be destroyed should the White Mesa alternative be approved. The DEIS should include pictures of the types or archeological sites that would be destroyed. Attached is a publication that includes pictures. This document is available at http://www.utah.sierraclub.org/. As the author of that document, I give the DOE permission to make use of any pictures or text from that document. Please! Download, cut, and paste.

The DEIS references a document, still in the works, by J. Fritz, Potential Traditional Cultural Properties within Moab Project Study Areas: A Preliminary Ethnographic Overview. Information from this study should be included in the final DEIS. Additionally, during the scoping process, much information was provided the DOE regarding the traditional uses of cultural resources in the vicinity of White Mesa. This information has not been included in the DEIS. It must be incorporated in the DEIS.

The DEIS fails to acknowledge that "mitigation measures" usually means the complete destruction of the archeological resources on the ground, after excavation.

This DEIS discussion does not include any reference to the license condition in IUSA's license (License Condition 9.7, NRC Source Material License SUA-1358) related to the identification and mitigation of archeological sites. The terms of this license condition should be included in the DEIS, as required by CEQ NEPA regulations at 40 C.F.R. §1502.25(b).

Response:

Section 304 of the National Historic Preservation Act allows federal agencies to withhold sensitive information relating to the location or character of cultural resources from the public, including the information in the Class I inventories and the Preliminary Traditional Cultural Property report prepared for this project. It would be a disservice to tribal members and other people who care about these sites if their locations were made known to the general public. DOE has shared this sensitive information with the appropriate tribal representatives. By withholding this information from the public, DOE is protecting the integrity of archaeological, historic, and sacred sites. The EIS includes enough information from the Class I inventories and Preliminary Traditional Cultural Property report to analyze and compare the various alternatives. The results of the analysis indicate that the White Mesa Mill (slurry pipeline) alternative would, by far, have the most adverse effects on cultural resources.

Cultural resources located on and near the Section 16 borrow area are discussed in Section 3.5.10, and impacts to these resources are described in Section 4.5.

Document #706 Comment #56 - response continued

The EIS describes potential mitigation measures for cultural sites in Sections 4.1.9.1, 4.2.9.2, 4.3.9.2, 4.4.9.2, and 4.4.9.3. In general, mitigation might include (1) avoiding the cultural resource sites, (2) monitoring cultural resource sites during surface-disturbing activity, (3) excavating and recording cultural resource data before construction activities began, and (4) moving cultural resource objects from areas of disturbance to nearby undisturbed areas.

The EIS does not reference IUC's license (License Condition 9.7, NRC Source Material License SUA-1358) because cultural resource mitigation for the Moab Project would be determined by a new Memorandum of Agreement between the Utah SHPO, DOE, IUC, the Ute Mountain Ute Tribe, and other affected parties if the White Mesa Mill alternative were selected. However, because of the comments received by the public and cooperating agencies and results of analyses provided in the EIS (including consideration of the consequences of the uncertainties characterized in the EIS), DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE will continue to consider these comments in its final decision-making.
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Document #706 Comment #57 Commentor: Fields, Sarah

It is clear that the numerous adverse impacts to significant, treasured, culturally meaningful resources on and in the vicinity of White Mesa, which cannot in any manner be mitigated, make consideration of the White Mesa option completely unacceptable.

Response:

See response to comment #56.
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Document #707 Comment #1 Commentor: Fields, Sarah M.

I. IUSA Operations

The activities at the Moab Mill are currently under the supervision and direction of the Department of Energy (DOE) pursuant to Title I of UMTRCA.

IUSA's proposal contains three major operations: 1) a slurry preparation plant at the Moab Mill, 2) slurry and recycle pipelines between the preparation plant and the IUSA Mill at White Mesa, and 3) the disposal site at White Mesa. Currently the IUSA mill is operated under a 10 C.F.R. Part 40 source material license pursuant to Title II of UMTRCA.

IUSA proposal states that the slurry preparation plant will be under IUSA's supervision and direction. The pipelines will also be under their control and direction. It appears that IUSA would own both operations.

QUESTIONS:

1. Since IUSA believes that they would control and operate the slurry preparation plant and the materials that enter that plant at the Moab Mill will, at that point, become the property of IUSA, under what regulatory regime would IUSA operate that slurry preparation plant?

2. Would that slurry plant become part of IUSA's Title II licensed activities? If so, is the DOE authorized to have a Title II operation at a Title I facility?

3. Would IUSA operate the slurry preparation plant as a contractor to the DOE? If so, would the DOE have oversight responsibility for that Moab Mill operation?

4. Would the pipelines become part of IUSA's licensed activities? If not, which State or Federal agency or agencies would have oversight over the construction and operation of the pipeline. Which statutes and regulations apply?

5. If IUSA takes ownership of the tailings at the Moab site and their slurry operation and/or pipelines are part of their uranium mill facility operation, where in statute and NRC or State of Utah regulations is this authorized? What Part 40 regulations, guidances, manuals, etc., apply to this type of operation?

6. I may have missed some questions. Basically, I would like to know what statutes and regulations would apply and how they would be applied to the slurry preparation and pipeline facilities and operations if the IUSA proposal is approved.

Response:

1. As stated in Section 2.2.5.2, IUC would take ownership of the tailings slurry at the entrance to the slurry pipeline system at the Moab site under the regulatory authority of the State of Utah.

2. The slurry plant at the Moab site would be DOE's responsibility. The drying plant at the White Mesa Mill would be IUC's responsibility. There would be no Title I actions at IUC's Title II facility.

Document #707 Comment #1 - response continued

3. If, in the Record of Decision, DOE decided to transport the tailings to White Mesa Mill by pipeline, the operator of the on-site slurry plant would then be selected. DOE would oversee any selected contractor.

4. See response to comment #1.

5. The provisions of both federal and state statutes allow the evaluation of alternative feed stocks.

6. As stated in the EIS (Section 2.2.5.2), the State of Utah's regulations would apply to IUC's operations.
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Document #707 Comment #2 Commentor: Fields, Sarah M.

II. Rights of Way

The fact that it is doubtful that IUSA would be able to get a right of way over the Matheson Wetlands Perserve would seem to be something that would preclude the implementation of IUSA's proposed project. Yet, many FTE's and funds have been spent on considering a proposal that would be moot because the required rights of way are likely not available to this private entity.

I do not understand why this basic issue has not been brought up and settled. IUSA seems to think that a non-publicly available memo from a law office suffices as a reasonable assurance that there is no problem with rights of way.

QUESTION:

1. Why has the DOE gone ahead with consideration of the the IUSA proposal when it it quite possible that IUSA will not be able to abtain the required rights of way?

2. Why has the DOE not even bothered to inquire of the various owners or responsible parties for the land that IUSA would have to cross with a pipeline in order to determine whether any right-of-way difficulties might arise that would block IUSA's proposed project?

3. If the IUSA Mill alternative is chosen as the preferred alternative, is the DOE authorized or prepared in any way to exert federal authority in order to obtain the required rights of way on behalf of IUSA?

The DEIS sheds no light on these legal and regulatory authority questions.

Thank you for your attention to these matters. If you are unable to answer these questions with authority, please refer them to the appropriate persons.

Document #707 Comment #2 - continued

Response:

Both federal and state regulations have provisions to facilitate the installation and use of pipelines, power lines, highways, and other infrastructure components that serve local, regional, and national needs. Because most of the pipeline route to the White Mesa Mill would parallel existing pipeline routes, it is clear that access to public and private lands has been obtained in this region in the past, and therefore, for the purpose of evaluating alternatives in the EIS, it is clear that a pipeline is a reasonable alternative. However, the potential difficulty in obtaining access is recognized.
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Document #1368 Comment #1 Commentor: Davenport, James H.—Colorado River Commission of Nevada

The integrity of the Colorado River water resource is vitally important to the more than 20 million people in the Lower Colorado River Basin states of Arizona, Nevada, and California, including the growing populations of Southern Nevada who rely on the River as the major source of their water supply. Protection of this important natural resource requires that the Moab uranium mill tailings site be cleaned up in a manner that provides absolute, long-term protection for the Colorado River.

Response:

DOE recognizes the vital importance of the Colorado River water resource to the populations of the Lower Colorado Basin states. The Department is confident that any of the proposed action alternatives analyzed in the EIS would provide long-term protection for the river. However, because of the uncertainties described in Section 2.6.3 of the EIS, DOE does not believe that any remedy can guarantee absolute, long-term protection. DOE recognizes that long-term uncertainties are greater under on-site disposal than under off-site disposal and will consider the relative uncertainties in its final decision-making.
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Document #1368 Comment #2 Commentor: Davenport, James H.

There are numerous factors related to Colorado River water resource protection that warrant relocation of the tailings pile to a safer and more secure location. These include (without limitation): the potential for catastrophic discharge due to impoundment failure resulting from natural subsidence and periodic inundation by the Colorado River (portions of the tailings impoundment are located within the 100- and 500-year floodplains); the potential for the Colorado River to migrate and de-stabilize the pile; and the potential for continued, long-term discharge of elevated contaminant concentrations from groundwater emanating from beneath the pile.

Response:

In its analyses, DOE has considered each of the factors cited in the comment (see Sections 4.1.3, 4.1.4, and 4.1.17). DOE has also considered the consequences of the uncertainties characterized in the EIS and the comments received on the draft EIS. Based on these considerations, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. The Department will continue to consider this comment and others as it finalizes its decision.
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Document #1368 Comment #3 Commentor: Davenport, James H.

Among the alternatives proposed and discussed in the DEIS, the only alternative which accomplishes this resource protection objective is Off-Site Disposal. Among the Off-Site Disposal alternatives, the best off-site disposal location appears to be Klondike Flats utilizing rail transportation.

Response:

DOE has identified off-site disposal at the Crescent Junction site using rail transportation as its preferred surface remediation alternative. The basis for DOE's identification of this preferred alternative is provided in Section 1.4.
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Document #1368 Comment #4 Commentor: Davenport, James H.

The Klondike Flats location is sufficiently distant (18 miles) from the Colorado River to preclude tailings pile-riparian conflict. The dry-material handling approach, enabling mixing, surface transportation, and even distribution and compaction of spoils at the new disposal site, is capable of being interrupted in the event operational problems arise. The new disposal site is capable of being designed with maximum security and safety in mind. The rail transportation approach, using sidings already constructed and serving both the Moab and Klondike Flats sites, permits separation of transportation of spoils from transportation on U.S. 191 by the general public. The Klondike Flats location does not implicate interstate traffic on I-70, as would the Crescent Junction site.

Response:

The EIS is consistent with the commentor's assessment of the physical attributes of the Klondike Flats site as presented in Section 3.2. Operational problems could occur under all the action alternatives, although the potential for such problems would be less under the on-site disposal alternative because fewer operations would be required. Similarly, the EIS is consistent with the commentor's assessment of the transportation issues as described in Section 4.2.

As noted in the response to comment #2, DOE has identified off-site disposal at Crescent Junction using rail as its preferred surface remediation alternative. Further discussion of the basis for DOE's identification of its preferred alternatives is provided in Section 1.4.
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Document #1368 Comment #5 Commentor: Davenport, James H.

The Colorado River serves not only as a critical water supply for the Southwest, but as a paramount ecological resource as well. According to the DEIS the primary contaminant of concern with respect to water quality and impacts to the Colorado River is ammonia, specifically, its high concentrations and corresponding toxicity to aquatic organisms. Federally listed species that could potentially be adversely affected by ammonia and other contaminants include the endangered Colorado pikeminnow, razorback sucker, humpback chub, and bonytail.

Response:

The comment accurately reflects the characterization of the environment included in the EIS. Additionally, Appendix A includes the Biological Assessment and Biological Opinion, which considers all the federally listed endangered species and addresses potential impacts from ground water contamination at the Moab site.
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Document #1368 Comment #6 Commentor: Davenport, James H.

The CRC, other participating Nevada agencies, agencies from Arizona and California, and the U.S. Bureau of Reclamation have initiated a long term, comprehensive initiative to recover endangered species and protect wildlife habitat on the Colorado River from Lake Mead to the U.S.-Mexico border. The Lower Colorado River Multi-Species Conservation Program (MSCP) is a 50-year initiative designed to create more than 8,100 acres of riparian, marsh and backwater habitat for 31 covered species at a cost of more than $620 million, included in the list of MSCP-covered species are the razorback sucker, humpback chub, and bonytail, three of the four endangered species listed above. Ongoing discharge of contaminated groundwater, emanating from beneath the Moab uranium mill tailings pile, to the Colorado River is presumably deleterious to them. The Department of Energy should choose an alternative that endorses and enhances the actions of Lower Colorado River Basin states and the Bureau of Reclamation, that complements the strategy of the MSCP and ensures the protection of sensitive, threatened, and endangered species of fish, wildlife, and their habitat, rather than one that operates contrary to those actions.

Response:

As described in the EIS, under the current pre-remediation conditions, site-derived contamination cannot be detected above background levels a few hundred meters downstream. Based on the analyses documented in the EIS, DOE is confident that implementation of any of the action alternatives would provide long-term proteciton of human health and the environment. See also response to comment #4.
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Document #1396 Comment #1 Commentor: Feinstein, Dianne—U.S. Senate

I am writing to urge the Department of Energy to adopt an off site remediation plan for the uranium mill tailings pile at the site near Moab, Utah. The Moab site lies adjacent to the Colorado River, which serves as a water resource for the citizens of Utah, Nevada, Arizona, and California.

The Draft Environmental Impact Statement (EIS) the Department of Energy released last November identified the environmental impacts of two primary remediation alternatives: one that would cap the tailings pile on site and one that involves off-site disposal. The Department did not, however, identify a preferred alternative as part of the Draft EIS. I wish to bring to your attention several of the reasons why the on-site alternative will not provide a long-term solution to this problem.

In response to the Draft EIS, the Environmental Protection Agency (EPA) indicated that because the on-site remediation alternative does not involve use of a liner underneath the disposal pile, contaminants from the tailings pile, including uranium and ammonia, will continue to seep into the groundwater and into the river. The EPA also pointed out that the eventual deterioration of the salt-beds underlying the disposal site will result in subsidence in the area of the site, compromising the integrity of the proposed cap and leading to radon releases and water infiltration through the pile.

The location of the Moab site within the 100-year floodplain for the Colorado River presents an increased risk of reintroducing contaminants into the groundwater and surface waters should heavy flooding occur. A recently released study by the U.S. Geological Survey indicated that part of the pile would be inundated by up to 25 feet of water during the flooding associated with 100-year to 500-year storms.

It is clear to me that the on-site alternative presents the possibility for significant adverse impacts on the Colorado River in the event of flooding or river migration, natural subsidence, or disposal cell failure. Because of the potential for prolonged environmental and public health risks associated with continued release of toxic contaminants into ground and surface waters, off-site disposal is the only option that offers a long-term solution.

I greatly appreciate your attention to this issue. It is my hope that the Department of Energy will move forward with a final remediation plan for the Moab site that includes off-site disposal of the uranium mill tailings and a comprehensive groundwater remediation strategy that provides long-term protection of the local citizens, and almost 25 million Americans who use the Colorado River water downstream.

Response:

As stated in the draft EIS, DOE intended to consider the analyses provided by the draft EIS along with public and agency comments before identifying a preferred alternative. The analyses in the EIS acknowledge the continuing contribution that an on-site disposal cell would make to ground water contamination, however, that contamination would only add 5 years to the projected ground water remediation program. The EIS also acknowledges subsidence of the Moab valley and projects that an on-site disposal cell would come into contact with the ground water in 7,000 to 10,000 years, which while a concern to DOE is beyond the required regulatory performance period of 200 to 1,000 years. DOE also determined that river migration is not likely within the

Document #1396 Comment #1 - response continued

regulatory performance period, however, additional mitigation measures are included in the on-site disposal cell design that would further reduce the already low probability of river migration. The EIS also assesses the impacts from expected period inundation of an on-site disposal cell and determined that such events would not release contaminants at concentrations above aquatic standards.

As noted in the EIS, Section 2.6, there are uncertainties associated with many of the analyses in the EIS related to long-term performance. For these reasons, in the final EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment, both locally and downstream, if they are selected in the Record of Decision. Further discussion of the basis for DOE's identification of the preferred alternatives is provided in Section 1.4.
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Document #1398 Comment #1 Commentor: Smith, Darrell H.—Salt Lake County Council of Governments

Dear Governor Huntsman:

At our Council of Governments meeting held March 3, 2005, COG members briefly discussed the studies currently underway to identify the best alternative for managing the 12 million tons of radioactive waste located next to the Colorado River near Moab. They were reminded of a site visit to the Moab area several of them participated in on October 2, 1998. The purpose of the visit was to receive a briefing on management problems involving the National Parks and other recreational facilities located nearby. The invitation for the visit was extended by Mr. Walt Dabney, Superintendent at that time for the Southeast Utah National Parks and Monuments group. Mr. Dabney realized that a large percentage of his visitors were residents of the Wasatch Front. He wanted the local elected officials from the Salt Lake County area who represented many of the urban visitors to understand the concerns he was dealing with.

One of the concerns identified by parks management was the Atlas Mineral Corporation tailing pile, sitting like a time bomb near the banks of the Colorado River. Our delegation stood on the road next to the tailings pile and observed where a portion of the tailings had already drained toward the River. Noting the devastated vegetation in the drain fields, COG members unanimously agreed that this toxic material should be moved. Given the fragility of the desert lands that make up so much of Utah, we agree with the notion that it is not a question of if the tailings will be washed into the Colorado River, but when. We support the removal of the tailings to a more appropriate site.

While moving the tailings will cost more in the short run, it does represent the most permanent and environmentally sound management alternative. The Colorado River plays such a vital role in the West as to render any alternative plan for onsite storage unacceptable. We cannot leave the lower Colorado River system at risk.

We appreciate your strong support of the removal option. We may have missed the deadlines for formal comment on the draft Environmental Impact Statement. We would appreciate it, therefore, if you would forward our views to the United States Department of Energy officials responsible for developing the Altas Tailing management plan in any of your subsequent communications.

Response:

Table 2−33 in the EIS addresses the potential for river migration and the potential for catastrophic floods, regardless of the cause of the flood, and the consequences of these events should they occur. Section 4.1.17 discusses the potential natural processes that could cause a failure of the disposal cell at the Moab site and the expected consequences and potential risks. Further, in the final EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. DOE is confident that these alternatives would provide long-term protection of the environment, both locally and downstream, if they are selected in the Record of Decision. Further discussion of the basis for DOE's identification of the preferred alternatives is provided in Section 1.4 of the EIS.
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Document #1400 Comment #1 Commentor: Zimmerman, Gerald R.—Colorado River Board of California

Moving the Moab Tailings Pile Off-Site

The CRB in its letter of June 22, 1999, to the Nuclear Regulatory Commission concluded that on-site capping of the mill tailings raised serious concerns due to the site's location adjacent to the Colorado River, and that the prudent and environmentally sound method of dealing with this problem would be to remove the tailings to another site. The CRB continues to hold that position. Please refer to the enclosed letter.

Also, one of the CRB's member agencies, The Metropolitan Water District of Southern California (MWD), in its letter dated February 17th to your agency, strongly believes that moving the Moab pile off-site is the only reliable and permanent alternative sufficient to protect the Colorado River from further contamination by radioactivity, organics, and inorganics; i.e. radium-226, ammonia and the total dissolved solid (TDS), etc.

Response:

DOE believes that either on-site or off-site disposal would meet the performance requirements of 40 CFR 192 and would be protective of human health and the environment. DOE will consider this comment in its final decision-making.
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Document #1400 Comment #2 Commentor: Zimmerman, Gerald R.

Additionally, the CRB concurs with the State of Utah's December 29, 2004, and February 15, 2005, letters to the DOE, which state that any remediation other than an off-site option is unacceptable (copies enclosed). With both the no action and the on-site alternatives, contaminated seepage will continue to leak from the tailings pile and into the Colorado River. Also, as pointed out by MWD there are potential adverse impacts to the Colorado River from both the no action alternative and the on-site alternative through natural subsidence, river migration, flooding, incision, and disposal cell or tailings pile failure.

The CRB strongly supports the off-site disposal option, as this is the prudent option, which offers long-term, permanent protection to the quality of water received by downstream Colorado River users. With both the no action and the on-site alternatives, contaminated seepage will continue to leak from the tailings pile and into the Colorado River, which is not acceptable.

Response:

The impacts that would result from natural subsidence, river migration, flooding, incision, and disposal cell or tailings pile failure under the on-site alternative are detailed in Section 4.1 of the EIS. DOE will consider these impacts and others, along with the comments received on the draft EIS, in its final decision-making.
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Document #1400 Comment #3 Commentor: Zimmerman, Gerald R.

Groundwater Remediation

DOE has not identifed a preferred option yet; however, Groundwater Extraction and Disposal are main components of the Groundwater Remediation proposal, which are addressed below.

Groundwater Extraction

In Section 2.3.2.1, two methods for extracting contaminated groundwater, i.e., “extraction wells” and “interception trenches” are mentioned. For the extraction wells method, 50 to 150 wells to depths of up to 50 feet would be installed. For the shallow trenches option, up to 2,000 lineal feet of trenches would be constructed to intercept shallow groundwater (the depth of the shallow trenches is not mentioned in the DEIS). It is indicated in the report that with both methods approximately 150 gallons per minute (gpm) of contaminated water would be extracted.

The CRB’s concern is that it is not conclusive whether any of these methods would capture all of the contaminated groundwater, that otherwise would reach the Colorado River. In Section 3.1.6.1 of the DEIS, it is mentioned that “site-related groundwater contamination occurs in the unconsolidated basin-fill aquifer in the upper hydrologic system.” Also, in Section 3.1.6.2, it is reported that the “average saturated thickness of the gravelly sand that constitutes the unconsolidated basin-fill aquifer is approximately 70 feet.” It is not clear whether a number of 50-foot deep wells or the trenches would capture the water in the 70-foot deep saturated aquifer and whether the 150 gpm extracted from these extraction wells or trenches is equal to or greater than the amount of groundwater flow to the Colorado River.

The CRB suggests that the following questions be addressed in the final EIS:

- The mechanism that would guarantee that the 50-foot deep wells would capture all of the contaminated groundwater.
- The same question is asked regarding the trenches option in light of the fact that the depth of the trenches is not indicated in the DEIS.
- Indicate the amount of contaminated groundwater that reaches the Colorado River. This should be compared with the amount of water that would be extracted.

Response:

Based on the analyses in the EIS and numerous other factors, DOE has identified active ground water remediation as its preferred alternative for addressing ground water contamination. The proposed ground water remediation system does not need to guarantee that the wells would capture all of the contaminated ground water. Ground water concentrations need to be reduced to the goal of approximately 3 mg/L ammonia to be protective in the surface waters.

Document #1400 Comment #3 - response continued

DOE has already undertaken interim actions at the Moab site to reduce contaminant migration. These actions include capturing and evaporating some of the most contaminated ground water from the legacy plume that is entering the Colorado River and reducing the contaminant seepage from the pile area that has the potential to migrate into the ground water beneath the pile. These interim actions have proven to be very effective in significantly reducing the total mass of contaminants reaching the river. On the basis of computer simulations of ground water movement and contaminant transport, DOE believes that river water quality protective of aquatic species can be permanently achieved in 75 to 80 years, regardless of the surface remedial action selected. The final design of the ground water system would be developed in a remedial action plan after DOE issues its Record of Decision.
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Document #1400 Comment #4 Commentor: Zimmerman, Gerald R.

Groundwater Disposal

In Section 2.3.2.1 of the DEIS, three methods of disposal of the extracted and treated groundwater are offered. These disposal options are: “discharge to surface water”, “shallow injection” and “deep well injection.” Although the “deep well injection” may provide more of a safety factor; there may be some restrictions and obstacles that would prohibit implementing this option, such as the rate that water can be continuously injected into the deep aquifer. Have those been identified and evaluated?

Response:

The final determination of the most appropriate technologies and methods for ground water treatment would require a more detailed characterization and engineering analysis. As stated in the EIS (Section 2.3.2), additional testing, characterization, or pilot studies may be required before the optimum system could be selected and designed. Final design would occur after the Record of Decision is issued.
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Document #1400 Comment #5 Commentor: Zimmerman, Gerald R.

Colorado River Basin Salinity Control Forum Policies

The alternative selected should at least meet all Colorado River Basin Salinity Control Forum (Forum) policies. The “Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program for Intercepted Groundwater” states that the discharge of intercepted groundwater into the Colorado River needs to be evaluated in a manner consistent with the overall objective of “no-salt” return whenever practical. The no-salt discharge requirement may be waived at the option of the permitting authority in those cases in which the discharge salt load reaching the main stem of the Colorado River is less than one ton per day or 350 tons per year, whichever is less. The water currently migrating from the bottom of the tailings pile has a composition of approximately 24,600 mg/L TDS and a flow rate of 20 gallons per minute. This data indicates that the TDS loading to the Colorado River under the no action alternative is 2.9 tons/day and the TDS loading to the Colorado River will remain above the threshold of one ton per day for the next 20 years under the no action alternative. If water is extracted and returned to the Colorado River, the Colorado River Basin Salinity Control Forum’s “Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program” should be met.

Response:

DOE’s preferred alternative for addressing ground water contamination is active ground water remediation, which would intercept and dispose of contaminated ground water before it reached the river. As stated in the EIS (Section 2.3.2), if discharge to the river were considered a viable alternative for dealing with treatment effluent, appropriate permits would need to be obtained from the state, and compliance with conditions such as discharge rates and effluent composition would be required.

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Document #1404 Comment #1 Commentor: Fields, Sarah M.

The U.S. Department of Energy (DOE) has included the Floodplain and Wetlands Assessment for Remedial Action at the Moab Site in the DEIS, pursuant to DOE requirements at 10 CFR Part 1022, Executive Order 11988, Floodplain Management, and Executive Order11990, Protection of Wetlands. DEIS, Volume II, Appendix F (pages F−1 to F−18). As will be shown below, the DOE has failed to implement these regulatory and Executive Order requirements.

Section F1. Introduction (page F−1). In this section, the Assessment fails to inform the public that if the DOE determines that “that no practicable alternative to locating or conducting the action in the floodplain or wetland is available,” then the DOE must issue a floodplain statement of findings, pursuant to 10 C.F.R. § 1022.14 (Findings). In other words, if the DOE determines that there is no practicable alternative to disposing of the tailings on-site, then a statement of findings must be issued for that action. Similar findings would be required for a decision to slurry or truck the tailings to White Mesa, due to the adverse impacts on the Scott M. Matheson Wetlands Preserve (Matheson Wetlands) and other waterways and wetlands from that alternative.

Further, in accordance with Section 1022.14(e), if the “proposed floodplain actions that may result in effects of national concern, DOE shall publish the floodplain statement of findings in the Federal Register.” Section 1022.4 defines “effects of national concern” as “those effects that because of the high quality or function of the affected resource or because of the wide geographic range of effects could create concern beyond the locale or region of the proposed action.” The Assessment must include a discussion of all the requirements related to a statement of findings.

Response:

DOE has complied with all the regulatory requirements in 10 CFR 1022 and Executive Orders 11988 and 11990 in its assessment of impacts to floodplains and wetlands. In the regulations, the phrase “no practicable alternative” was intended to address the physical location of activities within floodplains and wetlands. For example, the guidance would mandate that construction of a building could occur in a floodplain only if no other possible place for the building (“no practicable alternative”) exists. Because contaminated materials lie in the floodplain at the Moab site, there is “no practicable alternative” to activities within the floodplain under any of the proposed remediation alternatives. The Floodplain and Wetlands Assessment (Appendix F) was prepared in accordance with Section 1022.13. Because a Statement of Findings should not be issued until after comments on a floodplain/wetlands assessment are incorporated and alternatives are considered, DOE did not include a Statement of Findings in the draft EIS; however, it is included in this final EIS. DOE will comply with the notification requirements by referencing the Statement of Findings in the Notice of Availability for the final EIS. The Department also will include the Statement of Findings in the Record of Decision, which will be published in the Federal Register in accordance with CEQ regulations.

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Document #1404 Comment #2 Commentor: Fields, Sarah M.

Section F2.1 (Proposed Actions at the Moab Site—On-Site Disposal Alternative), at F2.1.1 (Remediation of Contaminated Materials) (page F−4). This section discusses the removal of "surface contamination" from the top layer" and removal of tamarisk.

There is no discussion of the depth of the "top layer" or the extent of surface and subsurface contamination on the balance of site (i.e., outside the tailings pile footprint).

The Assessment must include a map of the areas of contaminated materials that the DOE expects to excavate, including depth of materials, and areas that would need to be filled in with clean materials.

This section fails to mention the fact that the balance of contaminated site materials will be placed on the impoundment for de-watering purposes prior to placement of the final cover. The Assessment fails to address the future adverse impacts of the placement of that material on the amount of contaminants in the floodplain over time.

This section (and related sections in the DEIS) fails to acknowledge the presence of a 6.6-acre area at the southeast toe of the impoundment where the highest contamination is at moderate depth (below 30 cm). The area of contamination extends 200 feet from the toe of the tailings impoundment, encompassing an area approximately 1,500 long. The estimated volume of the contaminated material, which may have come from an old tailings' spill, is 25,000 cubic yards. See letter from Richard E. Blubaugh, Atlas Minerals, to Harry J. Pettengill, Uranium Recovery Field Office, Nuclear Regulatory Commission (NRC), June 29, 1987 (NRC Accession No. 8708050343), with enclosed "Evaluation of Sourtheast Area, Atlas—Moab Mill Facility," with eleven oversized drawings, EnecoTech Inc., June 30, 1987.

Please correct these oversights.

Response:

The section cited in the comment (F2.1) is a high-level summary of proposed actions at the Moab site under the on-site disposal alternative within the context of the floodplain and wetlands assessment appendix. It does not attempt to incorporate or repeat all the information regarding the proposed actions (Chapter 2.0), affected environment (Chapter 3.0), and impacts (Chapter 4.0) in the EIS. Section 3.1.3 describes contaminated materials at the Moab site, including the estimated depth of contamination. Section 2.1.1.2 (Contaminated Material Remediation Operations) in the EIS provides a general overview of the activities that DOE would undertake to clean up the contaminated areas that are located outside the tailing footprint but inside the Moab site boundary; that section includes a map (Figure 2−3) and a discussion of the estimated mass and volume of contaminated site materials that would be excavated from the site, loaded into dump trucks, hauled to the top of the tailings pile, and deposited on top of the center of the pile for dewatering.

Document #1404 Comment #2 - response continued

Data obtained from characterization of the Moab site suggest that vicinity properties surrounding the site boundary contain contamination that would also require remediation. These properties include portions of state highway and railroad rights-of-way, BLM property, and Arches National Park.

Section 1.2.2 (Current Status of the Site) explicitly acknowledges the existence of debris from past dismantling of the mill buildings and associated structures. This debris was placed in an area at the south end of the pile and covered with contaminated soils and fill.

Section 2.1.2 (Characterization and Remediation of Vicinity Properties) provides a general overview of the activities that DOE would undertake to survey, characterize, and remediate Moab site vicinity properties. More detailed characterization activities would be performed after completion of the Record of Decision, as shown in Figure 2−1 in the EIS.

A systematic evaluation of the short- and long-term impacts that would result from construction activities at the Moab site under the on-site disposal alternative is detailed in Section 4.1, “On-Site Disposal (Moab Site).”
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Document #1404 Comment #3 Commentor: Fields, Sarah M.

Section F2.1.2 (On-Site Disposal) (page F−4). This section states, in part: To further protect the disposal cell, a buried riprap wall would be installed in the Colorado River floodplain. The wall would protect the stabilized tailings pile from river migration and erosion to meet the design life of the disposal cell.

This section fails to reference any maps or specific engineering plans for the proposed riprap wall. There is no mention of any studies or technical evaluations regarding how the wall would protect the tailings pile from the Colorado River meander, erosion, and flood potential. There is no technical report discussing the location and extent of the wall, its depth and width, material size, etc.

The assertion that the wall would "protect the stabilized tailings pile from river migration and erosion to meet the design life of the disposal cell" is not substantiated. The DEIS provides no data whatsoever that demonstrates that a wall would be protective of the tailings impoundment.

Further, there is no mention of the specific length of said "design life." There is no discussion of any need to protect the disposal cell beyond the so-called "design life" or how that need would be met.

This section must substantiate its assertions regarding the ability of a riprap wall to protect the tailings pile for the length of time that river migration and erosion could impact the tailings. This time frame should not be limited. The requirements of 10 C.F.R. Part 1022 to assess floodplain and wetland impacts and avoid adverse impacts to wetlands and floodplains are not bounded by any "design life" time frames.

These failures in the Assessment must be corrected.

Response:

See response to comment #2. The conceptual location of the barrier wall is identified on Figure 2−3 of the EIS, the riprap size is provided in Section 2.1.4, and the estimated costs are provided in Table 2−33. Final specifications for cell design and mitigative engineering controls fall within the scope of the remedial action plan, which will be developed following the Record of Decision. DOE would use the recently prepared USGS report, which predicts the maximum flood velocities, and other relevant data sources to design a barrier wall and side slope armaments of sufficient robustness to withstand the forces of floodwaters.

DOE, federal and state agencies, and industry have demonstrated the effectiveness and implementability of riprap walls to prevent erosion on a nation-wide basis. DOE disagrees that the riprap wall would not be protective under the on-site disposal alternative. DOE also states in the EIS that inspections and maintenance would be completed as necessary to maintain these mitigative measures in perpetuity.

With regard to 10 CFR 1022, DOE is not required, nor are other agencies, to avoid adverse impacts to floodplains and wetlands. Agencies are required to consider alternatives if impacts would occur. DOE has complied with this requirement of DOE's regulations and with Executive Orders 11988 and 11990.

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Document #1404 Comment #4 Commentor: Fields, Sarah M.

Section F2.1.2 (On-Site Disposal) (page F−4). This section indicates that the only activities that would take place within the 100-year floodplain would be interim storage of borrow materials. The Assessment fails to mention of the interim and long-term groundwater correction activities that are in the floodplain. The Assessment fails to assess activities within the 500-year floodplain. The Assessment must give a full description of all on-site reclamation activities on the100 and 500-year floodplains and describe how those activities will be protected from flood hazards.

Response:

Section F2.1.2 relates only to the construction of the actual disposal cell. The remainder of Section F2.1 (e.g., Section F2.1.3 – Ground Water Remediation) discusses other activities at the Moab site associated with the on-site disposal alternative. The 500-year floodplain is not discussed because no critical actions are planned at the Moab site. Section F1.0 has been clarified to reflect this distinction.

DOE has addressed all the concerns listed by the commentor in various sections of the EIS. Floodplains and wetlands are discussed under each alternative in Chapters 3.0 and 4.0, including maps. It was DOE's decision to reduce the volume of the EIS by avoiding redundancy between the text and appendixes. Also see response to comment #2.
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Document #1404 Comment #5 Commentor: Fields, Sarah M.

Section F2.1.2 (On-Site Disposal) (page F−4). This section states, in part: Long-term maintenance and monitoring of the disposal cell would include inspecting the floodplain and river boundary and the buried riprap wall.

Here there is no mention of the length of time that "long-term maintenance and monitoring of the disposal cell" would be required. There is no mention of the costs involved in long-term maintenance. There is no assessment of the possibility that, over time, the ability of institutions to continue to monitor and maintain the disposal site and any protective wall will diminish, while, at the same time, the potential for degradation of the impoundment (from all causes) will increase. The Assessment must address these long-term maintenance issues.

Response:

See responses to comments #2 and #4. Cost and maintenance issues are discussed in Section 2.7.3 of the EIS. Annual maintenance costs of $35,000 could be required under all alternatives in perpetuity.
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Document #1404 Comment #6 Commentor: Fields, Sarah M.

Section F3.0 (Floodplain and Wetlands Descriptions), at F3.1 (Moab Site) (page F−5): The 100-year and 500-year floodplains for Moab Wash and the Colorado River occupy 150 acres, or the easternmost third of the Moab site (see Figure F–1). Floodplain alluvium consists of shallow sandy sediments and deeper gravelly sediments.

Here the map and the statement fail to discuss whether the area under the tailings impoundment is also on the flood plain of the Colorado River and Moab Wash and are also underlain by sediments. The Assessment fails to delineate the areas of the floodplain underlain by sediments from the Colorado River, the areas are underlain by sediments from Moab Wash, or areas underlain by both. Further, there is no mention of any past Moab Wash and Colorado River channel beds that underlie the site. Where the Colorado River has deposited sediments and created channels in the past is an important factor in assessing the potential for the Colorado River to create new channels in the floodplain.

The DOE should take all current data related to the sediments underneath the site and in the area, develop new data based on fieldwork, and properly characterize the sediments and structures (including their source) that underlie the Moab site. The DOE should create a three-dimensional characterization of the geological structures, channels, and sediments and create a history of the river/wash/site interactions. This has NEVER been done. Without such data and interpretations, the DOE has no basis for many of its assumptions related to long-term site stability.

Response:

A contour map showing the extent and elevation of the top of Colorado River gravels at the Moab site is presented in the calculation set "Lithologic, Well Construction, and Field Sampling Results from the 2002 Field Investigation" (DOE 2002b). This information was used in combination with all historical and current data to develop the 3-dimensional contaminant model (Section 5.5.1 in the SOWP) and the geologic cross-sections (Plates 2 through 10 in the SOWP). Also see response to comment #2.
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Document #1404 Comment #7 Commentor: Fields, Sarah M.

Section F4 (Floodplain and Wetlands Impacts), F4.1 (Moab Site—On-site Disposal Alternative) (page F−14). The Assessment improperly limits the consideration floodplain and wetland impacts to the impacts associated with the site itself. This Assessment fails to address the potential adverse impacts of the on-site disposal alternative on the Matheson Wetlands. There is no assessment of the potential of contamination from the site to impact the Matheson Wetlands via a pathway underneath the Colorado River. There is no mention of impacts to the Matheson Wetlands via air-borne contamination from the site. The Assessment must be revised to include these aspects of floodplain and wetland impacts, in a comprehensive manner.

Response:

DOE's position is that contamination is not migrating under the river and affecting the Matheson Wetlands Preserve. However, there are responsible opposing views on the fate and transport of site-derived contaminants in ground water. Both views on the question of contaminant migration under the river are based on differing interpretations of technical data. A new section on responsible opposing views (Section 2.6.4) has been added to the final EIS.

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Document #1404 Comment #8 Commentor: Fields, Sarah M.

The Assessment must address the continued contamination of the Moab site floodplain. The Assessment must address the extent to which the removal of the tailings from the floodplain would impact future floodplain and site contamination emanating from the impoundment.

Response:

See responses to comments #2 and #4. The potential for continued contamination of the floodplain is discussed at length in the EIS, including uncertainties associated with each alternative and the potential for catastrophic failure. Under all action alternatives, active ground water remediation would intercept contamination until such time (75 to 80 years) that levels would naturally attenuate to below applicable aquatic standards.

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Document #1404 Comment #9 Commentor: Fields, Sarah M.

The Assessment fails to address potential adverse impacts to floodplains and wetlands in the in the event of a tailings impoundment failure. A tailings pile failure would result in significant adverse impacts to the floodplain of the Colorado River downstream, the Moab Valley, and Matheson Wetlands. The Assessment must include a full description and evaluation of those adverse impacts on the floodplain of the Moab Valley and the Colorado River downstream and the Matheson Wetlands.

Response:

Section 4.1.17 of the EIS addresses the potential impacts from catastrophic failure.

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Document #1404 Comment #10 Commentor: Fields, Sarah M.

Section F4.1.1 (Floodplains). This section states, in part: The buried riprap wall would permanently alter the floodplain by stabilizing soils in the floodplain.

Here the Assessment does not evaluate the potential adverse impacts on the Colorado River, the Moab Valley, and the Matheson Wetlands of the riprap wall during a flood event. The Assessment must include such an evaluation.

This section fails to discuss the impacts to the Matheson Wetlands and floodplain at the site, downstream, and at Moab in the event that the riprap wall fails to serve its design function. The Assessment must include such an evaluation.

Response:

A systematic evaluation of impacts to the floodplain and wetlands that could occur at the site, including the Matheson Wetlands Preserve, are detailed in Section 4.1.5.1 in the EIS and in Appendix F (Floodplain and Wetlands Assessment for Remedial Action at the Moab Site). Uncertainties related to the occurrence of a catastrophic flood and to the impacts that would occur if a riprap wall failed to serve its design function are summarized the EIS (see Tables S1 and 2−33, Consequences of Uncertainty, item #10). The assessment of impacts to the floodplain and wetlands will be one factor among many that will be evaluated when DOE selects the disposal site and method in the Record of Decision.
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Document #1404 Comment #11 Commentor: Fields, Sarah M.

Section F4.4 (Off-Site Disposal—White Mesa) (page F−16): The slurry pipeline transportation option would involve crossing the Colorado River and the Matheson Wetlands Preserve, along with 11 perennial streams and at least 21 intermittent drainages. There have been previous utility crossings in the Matheson Wetlands Preserve, and the pipeline for this project would follow these as closely as possible.

The DIES and Assessment fail to discuss whether the pipeline and slurry operation would be owned an operated by a private entity or the federal government. It fails to state what federal regulations apply to the construction and operation of the pipeline. At times, the DEIS gives the impression that the pipeline and slurry operation would be a DOE operation. However, International Uranium (USA) Corporation (IUSA), in its May 2003 proposal, specifically stated its desire that the slurry operation and pipeline be under their ownership and control. This must be clarified.

Response:

Section 2.5.2.2 indicates that under the White Mesa Mill slurry pipeline alternative, IUC would take ownership at the entrance to the slurry pipeline at the Moab site under the regulatory authority of the State of Utah. Slurry pipeline operations to the other off-site alternative locations would be the sole responsibility of DOE and its contractors.
==

Document #1404 Comment #12 Commentor: Fields, Sarah M.

The Assessment gives the impression that no new pipeline corridors would be involved in the construction of the slurry pipeline. This is backed by the failure to include a map in the Assessment that identifies current pipeline corridors and proposed new pipeline corridors.

Response:

Section 2.2.4.2 states that approximately two-thirds of the pipeline corridor would follow existing corridors. The figures in Appendix C identify the specific pipeline segments that would parallel existing pipelines.
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Document #1404 Comment #13 Commentor: Fields, Sarah M.

There is no basis for the assumption that permission would be given to build a pipeline to carry the slurry across the Matheson Wetlands. There is also no basis for the assumption that permission would be given to build a pipeline across federal lands. The Assessment fails to reference the Federal Regulation applicable to obtaining a pipeline permit over Department of Interior, Bureau of Land Management, lands—43 C.F.R. 2800.

Response:

DOE has worked closely with several cooperating agencies, as required by the CEQ NEPA regulations. DOE is aware of BLM's right-of-way regulations for use of public lands under Title V of the Federal Land Policy and Management Act. With regard to pipeline construction over private lands, DOE must make assumptions in order to evaluate all reasonable alternatives. The EIS does not assume that private landowners would agree to the pipeline route.
==

Document #1404 Comment #14 Commentor: Fields, Sarah M.

Here the Assessment must provide information regarding what permissions and permits are required for the pipeline, applicable statutes and regulations, who will apply for such permissions and permits, the position of The Nature Conservancy and the State of Utah regarding whether they would grant permission for a slurry pipeline across the Matheson Wetlands, and whether the DOE can or is willing to exert powers of eminent domain to assure that a pipeline can be constructed over private or State of Utah land. The DOE has not been forthright in discussing these important aspects of the slurry pipeline in the DEIS and Assessment.

Response:

Both federal and state regulations have provisions to facilitate the installation and use of pipelines, power lines, highways, and other infrastructure components that serve local, regional, and national needs. Because most of the pipeline route to the White Mesa Mill would parallel existing pipeline routes, it is clear that access to public and private lands has been obtained in this region in the past, and therefore, for the purpose of evaluating alternatives in the EIS, a pipeline is a reasonable alternative. However, the potential difficulty in obtaining access is recognized. The comments of the Nature Conservancy can be found in Document #699.
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Document #1404 Comment #15 Commentor: Fields, Sarah M.

Section F4.4 (Off-Site Disposal—White Mesa) (page F−16). This section states, in part: Unavoidable disturbance to wetlands along waterways would be mitigated in accordance with USACE Section 404 guidelines (see Section F4.1.2).

The Assessment fails to map and clearly identify the disturbances (unavoidable and avoidable) along and through waterways. No pictures or technical studies to back up any of the discussion of wetland, stream, and dry watercourse disturbances. Everything is very general and specificities are avoided. The Assessment must provide more specifics and substantiation with respect waterway disturbances.

Response:

Given the distance involved, it was not practical to include maps with more detail than those provided in Appendix C, although DOE did consult the data on these figures in more detail to develop its impact analyses. Specific details concerning the extent of the disturbance needed to quantify acreages that would be impacted are unknown because the alternative is conceptual. If the White Mesa Mill alternative were chosen, a more detailed assessment of the disturbance would be done in order to issue a Floodplain and Wetlands Statement of Findings.
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Document #1404 Comment #16 Commentor: Fields, Sarah M.

Section F4.4 (Off-Site Disposal—White Mesa) (page F−16). This section states, in part: Some of the springs or seeps adjacent to the White Mesa Mill site may be hydrologically connected to the site, and there could be a potential for ground water contamination due to spills, pipeline rupture, or other accidents. Mitigation to minimize the possibility of exposure would be implemented.

No impacts to floodplains and wetlands would be expected from monitoring and maintenance of this facility.

The Assessment fails to provide an evaluation of the long-term impacts of the White Mesa alternative on the springs and seeps that are "hydrologically connected to the site." The Assessment fails to provide any basis for its assumption that, over the long term, monitoring and maintenance of the facility would prevent adverse impacts to the seeps and springs. The Assessment fails to acknowledge that, over the lifetime of the hazard, the potential for adverse impacts to the seeps and springs will increase, while the effectiveness of monitoring and maintenance of the facility will inevitably decrease.

Response:

Section 4.4.3.1 in the EIS presents the ground water impacts and assumptions related to the White Mesa Mill disposal alternative, including the potential for migration of existing and Moab-site contaminants to reach springs and seeps downgradient of the White Mesa Mill site. These factors and the long-term limitations and effectiveness of monitoring are considered in sufficient detail for evaluation of alternatives in this EIS.
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Document #1404 Comment #17 Commentor: Fields, Sarah M.

The potential for adverse impacts on ground water will, in great part, be dependent on the design and construction of the impoundment and the placement of the tailings in that impoundment. At this time, there is no information available on these aspects of the White Mesa proposal.

The Assessment fails to provide any bases for its assumptions re the impacts related to the White Mesa alternative. These failures must be corrected in the final Assessment.

Response:

Section 2.2.5.2 of the EIS summarizes the proposed White Mesa Mill disposal cell construction and operations. Section 4.4 in the EIS presents the impacts and assumptions related to the White Mesa Mill disposal alternative. DOE believes these are presented and considered in sufficient detail for comparison and evaluation of alternatives in this EIS.
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Document #1404 Comment #18 Commentor: Fields, Sarah M.

Effects of National Concern. The Assessment fails to discuss whether the proposed floodplain actions may result in effects of national concern. According to 10 C.F.R. § 1022. 4, such effects are those that, because of the high quality or function of the affected resource or because of the wide geographic range of effects, could create concerns well beyond the locale or region of the proposed action.

The Assessment improperly fails to acknowledge that the potential adverse short-term and long-term effects of the disposal of the Moab tailings in the floodplain of the Colorado River creates a concern far beyond the Moab Project site and the Moab Valley.

The Colorado River is the 5th largest river in the United States and is the source of drinking water for millions of people. It is a recreational resource for millions and the source of agriculture waters thousands. The waters of the Colorado below the site flow though federal parks and recreation areas, tribal sovereign lands, and a foreign state. A tailing failure scenario would be a catastrophe of national and international, not just local, proportions.

It is unconscionable for the DOE not to have recognized, identified, and considered effects of national concern in the Assessment and in the DEIS.

Response:

DOE disagrees with the comment. Without a failure or flooding, there would be no impacts to the resources identified in the comment. Flooding is assumed to occur, and the conservative analyses show (Section 4.1.3.1) that aquatic standards would not be exceeded, and, therefore, there would be no measurable impact from flooding. Even though improbable, a catastrophic failure has been assumed, and the impacts are quantified in Section 4.1.17. Also, the analyses do not support the commentor's assertion that a catastrophic failure would be on the scale of a national or international disaster.
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Document #1404 Comment #19 Commentor: Fields, Sarah M.

Navigable Waterway. There is no mention in the Assessment that the wetlands associated with the site and the Matheson wetlands are part of a navigable waterway and subject to the provisions of Section 13 of the Rivers and Harbors Act of 1899. Section 13 (the "Refuse Act"), in part, prohibits the deposition of any material on the bank of any navigable water where it is liable to be washed into the navigable water, whereby navigation may be impeded or obstructed.

The Assessment must include a discussion of this act and its relation to the impacts to wetlands and floodplains under consideration here.

Response:

DOE is not proposing to discharge any material into the wetlands associated with the site or into the Matheson Wetlands Preserve as part of any alternative.
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Document #1404 Comment #20 Commentor: Fields, Sarah M.

Subsidence. The Assessment fails to discuss and address the impacts on the floodplain and wetlands that will take place over time due to the dissolution of salt below the site. The DOE must take into consideration long-term subsidence of the site when it assesses adverse impacts to the floodplain and wetlands related to the Moab site.

Response:

The commentor is correct that the EIS does not explicitly address the impacts of long-term natural basin subsidence due to salt dissolution on floodplain and wetlands. This is because of the extremely long time frame and consequent uncertainties involved. Section 4.1.1 addresses the geology and soil impacts at the Moab site. Over geologic time, the process of subsidence, which is caused by ground water dissolving the salt formations under the tailings pile (Section 3.1.1.4), will change the position of the tailings pile in relation to the underlying ground water and will eventually cause the bottom of the tailings pile to converge with the underlying ground water at an estimated rate of approximately 1.4 feet per 1,000 years. At this rate, DOE estimates that the tailings in the disposal cell would come into permanent contact with ground water in approximately 7,000 to 10,000 years, assuming the minimum depth to ground water ranges from 5 to 7 feet. The regulatory time frame for effectiveness established in 40 CFR 192 (Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings) is 200 to 1,000 years.
==

Document #1404 Comment #21 Commentor: Fields, Sarah M.

10 C.F.R. Part 1022—Compliance With Floodplain And Wetland Environmental Review Requirements.

As stated in Part 1022, it is the intent of the DOE to incorporate floodplain management goals and wetland protection considerations into its planning, regulatory, and decision-making processes, and preserve natural and beneficial values served by floodplains and wetlands. Part 1022 implements the directives set forth in Executive Order 11988 and Executive Order11990.

The Executive Orders demand that a floodplain and wetlands assessment serve as a decision-making document. In order to fulfill that function, the assessment must include several things. Below is an evaluation of how well the Floodplain and Wetlands Assessment for Remedial Action at the Moab Site meets the Executive Order and regulatory requirements.

A. 10 C.F.R. § 1022.13 (Floodplain or wetland assessment), at (a)(1), requires a map showing the location of the proposed action with respect to the floodplain and/or wetland.

None of the maps in the Assessment show the location and extent of the Matheson Wetlands. There is no map that shows the floodplain of the Colorado River that would be impacted in the event of a failure of the tailings impoundment. The map of the White Mesa site does not show the full extent of the pipeline. The size of the map makes it impossible locate any of the washes or streams that might be impacted by the pipeline.

Response:

Figure F−1 delineates the floodplains that would be affected by the proposed actions. Additionally, wetland delineations are provided in the EIS text and Appendix C figures; because this information was readily available, it was not duplicated in Appendix F. Given the distance involved, it was not practical to include maps with more detail than those provided in Appendix C, although DOE did consult the data on these figures in more detail to develop its impact analyses. The postulated catastrophic failure analysis has been included to support decision-making among alternatives. Because DOE can find no plausible mechanism for such a failure, expanding the screening analysis to include detailed impacts on wetlands and floodplains was determined to be too speculative for inclusion in the EIS.
==

Document #1404 Comment #22 Commentor: Fields, Sarah M.

10 C.F.R. § 1022.13 (a)(2) (Floodplain or wetland Impacts) requires:

This section shall discuss the positive and negative, direct and indirect, and long- and short-term effects of the proposed action on the floodplain and/or wetland. This section shall include impacts on the natural and beneficial floodplain and wetland values (Sec. 1022.4) appropriate to the location under evaluation. In addition, the effects of a proposed floodplain action on lives and property shall be evaluated. For an action proposed in a wetland, the effects on the survival, quality, and function of the wetland shall be evaluated.

The Assessment clearly fails to provide a discussion of the long-term effects of the on-site disposal alternative on the Matheson Wetlands, the floodplain in rest of the Moab Valley, and the Colorado River floodplain down river from the site.

There was no assessment of the long-term impacts on the" natural and beneficial floodplain and wetland values" associated with those floodplains and wetland. According to Section 1022, floodplain and wetland values include, but are not limited to, "living values (e.g., conservation of existing flora and fauna including their long-term productivity, preservation of diversity and stability of species and habitats), cultural resource values (e.g., archeological and historic sites), cultivated resource values (e.g., agriculture, aquaculture, forestry), aesthetic values (e.g., natural beauty), and other values related to uses in the public interest (e.g., open space, scientific study, outdoor education, recreation)." There is no discussion in the assessment of how, over the long-term and the very-long term, the Moab disposal alternative will eventually impact these values at the Matheson Wetlands, Moab Valley, and floodplain downstream from the site.

There is no discussion of either short or long-term impacts on lives and property associated with the failure of the tailings impoundment or and failure of the proposed mitigative measure (riprap wall).

There is no discussion of the long-term effects on the survival, quality, and function of the Matheson Wetlands as a result of on-site disposal.

Response:

DOE disagrees that its analyses have failed to meet the spirit and intent of applicable regulations. Because contamination currently occurs within and beneath floodplains and wetlands, remedial actions must occur within these features. However, the long-term benefit of short-term remediation impacts would benefit these environments. Because both the on-site and off-site alternatives, coupled with active ground water remediation, would achieve compliance with 40 CFR 192 and meet protective levels for aquatic species, there would be no long-term potential to impact the Matheson Wetlands Preserve, the Moab Valley, or downstream users without assuming a failure of engineered systems or other remedial efforts. Catastrophic failure, even though highly unlikely, was assumed in the EIS to support decisionmaking and the choices among alternatives. Because there is no plausible mechanism for such a failure, the inclusion of such an accident was determined to be inappropriate for the floodplain and wetlands assessment.
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Document #1404 Comment #23   Commentor: Fields, Sarah M.

10 C.F.R. § 1022.13 (a)(3) (Alternatives) requires that DOE evaluate measures that mitigate the adverse effects of actions in a floodplain and/or wetland.

The Assessment mentions the construction of a riprap wall that would act to mitigate adverse effects, but that measure has in no way been “evaluated” for short or long -term effectiveness in the Assessment.

Response:

Riprap is an accepted engineering control to mitigate adverse impacts and stabilize improvements such as bridges and dam embankments nation-wide. Because riprap would be sized to withstand the maximum velocities projected recently by the USGS during flooding, it is reasonable to assume that the barrier wall and side slope armaments would perform as designed. Failure of these systems was assumed for the catastrophic analyses provided in Section 4.1.17 of the EIS.
==

Document #1404 Comment #24 Commentor: Fields, Sarah M.

10 C.F.R. § 1022.3 (Policy) sets forth various mandates related to floodplain management and wetland protection applicable to the Moab Mill Project. This section requires, in part, that the DOE:

- Minimize the impact of floods on human safety, health, and welfare;
- Restore and preserve natural and beneficial values served by floodplains;
- Minimize the destruction, loss, or degradation of wetlands;
- Preserve and enhance the natural and beneficial values of wetlands.
- Undertake a careful evaluation of the potential effects of any proposed floodplain or wetland action.
- Avoid to the extent possible the long- and short-term adverse impacts associated with the destruction of wetlands
- Identify, evaluate, and as appropriate, implement alternative actions that may avoid or mitigate adverse floodplain or wetland impacts.

The Assessment must provide information regarding how each of these mandates would be met for each alternative under consideration. The Assessment must provide a table comparing the floodplain and wetland impacts of the various alternatives and how the wetland and floodplain requirements would be met.

Response:

See responses to comments #2, #4, #5, #8, #21, and #22. In addition, DOE regulations and guidance do not “mandate” the list of items outlined above. 10 CFR 1022.1 and Executive Orders 11988 and 11990 require federal agencies “to ensure that the potential effects of any actions it may take in a floodplain are evaluated...”. 10 CFR 1022.3 states that “DOE shall…(a) avoid to the extent possible the long- and short-term impacts…and avoid…floodplain and wetland development wherever there is a practicable alternative.” 10 CFR 1022.3(b) also requires DOE to incorporate goals to protect wetlands “to the extent practicable.” In assessing alternatives in the EIS and preparing the Floodplain and Wetlands Assessment in Appendix F, DOE has complied with these requirements.
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Document #1404 Comment #25 Commentor: Fields, Sarah M.

Conclusion: On-Site Disposal Alternative. Due to the potential of the tailings impoundment to continue to adversely impact the floodplain of the Colorado River at the site and the long-term potential for impacts of the Matheson Wetlands and floodplains in the Moab Valley and downstream, the only alternative that would remove the source of those adverse impacts is an off-site disposal alternative.

There is no basis for a finding that "no practicable alternative to locating or conducting the action in the floodplain or wetland is available." The DOE has already identified three "practicable" off-site disposal alternatives and evaluated them in the DEIS. Since they were considered in the DEIS, by definition, there are "practicable" alternatives. The DOE in not authorized to consider impracticable alternatives in the National Environmental Policy Act (NEPA) process.

Therefore, in order to avoid the short-term and long-term adverse impacts to the wetlands and floodplains impacted by the proposal, the on-site disposal alternative must be rejected.

Response:

See responses to comments #2, #4, #22, and #24.
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Document #1404 Comment #26 Commentor: Fields, Sarah M.

Conclusion: White Mesa Disposal Alternative. The off-site disposal alternative that would have the most impacts on wetlands is the slurry pipeline to White Mesa. The pipeline would adversely impact the Matheson Wetlands, watercourses, and other wetlands.

The disposal of the tailings at White Mesa has the reasonable potential to impact a unique wetland at Ruin Spring, which is on land belonging to the people of the United States. I have visited this spring. Grazing cattle (associated with a Bureau of Land Management grazing permit) and wildlife depend on the spring, which is a rare spring in a very, very dry area. The DOE cannot rely on monitoring and maintenance of the facility over the long term to protect the spring from contamination.

There is no basis for a finding that there is “no practicable alternative” to disposing of the tailings at White Mesa or slurrying the tailings to White Mesa. The DOE has already identified two “practicable” off-site disposal alternatives, Klondike Flats and Crescent Junction, and evaluated them in the NEPA process. Implementation of either of these two off-site disposal alternatives would result in few, if any, adverse wetland and floodplain impacts.

Therefore, in order to avoid the short-term and long-term adverse impacts to the wetlands by the White Mesa proposal, that disposal alternative must be rejected.

Response:

See responses to comments #2, #4 and #24. The potential to affect water quality at Ruin Spring is assessed under Section 4.4.3.1 of the EIS and could occur within 3,500 to 7,700 years. In addition, an alternative cannot be rejected solely because it may adversely affect floodplains or wetlands. These resources are considered together with other natural resources and human health impacts in the decision-making process. The commentor’s preferences will be considered by DOE in its final decision-making.
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Document #1405 Comment #1 Commentor: Brian, Danielle

The Project On Government Oversight (POGO) investigates, exposes, and seeks to remedy systemic abuses of power, mismanagement, and subservience by the federal government to powerful special interests. Founded in 1981, POGO is a politically-independent, nonprofit watchdog that strives to promote a government that is accountable to the citizenry. POGO appreciates the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the "Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah" (69 Fed. Reg. 70,257 (2004)). POGO vehemently requests that the government relocate the Moab Uranium Mill Tailings to a safe location.

Since the late-1990's, POGO has voiced concerns about the government's plan to decommission the Moab Uranium Mill Tailings – located in a 130-acre unlined pile about 750 feet from the Colorado River. At that time the tailings pile was the jurisdiction of the Nuclear Regulatory Commission (NRC).

In 1999, POGO released its report NRC Sells Environment Down the River, which confirmed that the Atlas Corporation, the polluter that owned the Moab site, had bullied the NRC into accepting a cleanup plan that would have saved the company millions of dollars. That plan, however, fell far short of government and public safety standards. The NRC considered capping the nearly 12 million tons of uranium mill wastes at its current location rather than moving it to a safe location.

As you probably know, studies showed that merely capping the 130-acre tailings pile would allow the continued contamination of the ecosystem in and around the now defunct mill. The leaching from the tailings pile has negatively affected the Colorado River. Additionally, the pile is only 10−15 feet above an aquifer, is situated on the flood plane of the Colorado, and is filled with radioactive uranium, ammonia, molybdenum, aluminum, iron, nitrates, and sulfates that are contaminating groundwater that feeds into the river. Specifically, groundwater from the Moab site would continue to seep into the Colorado River, the source of drinking water for more than 25 million residents in California and Arizona and home to several endangered species of fish.

In 2000, POGO and many conservation groups pushed for and won their battle to have the jurisdiction of the tailing pile moved to the Department of Energy (DOE), which possessed the required experience in moving similar sites.

Now DOE is in the same position that the NRC was in nearly ten years ago – a drawn out decision to cap or relocate the uranium tailings. The current DEIS states that relocation of the uranium tailings pile will cost from $329 to $464 million, which is a far cry from the NRC's and Atlas' estimates in the late-1990s that relocating the tailings pile would cost $60 to $114 million. After years of delay and debate on relocation verses capping the uranium tailing pile at its current location, the taxpayer is left holding a ballooning bill in a financially restrictive budget crisis. More disturbing is the fact that radioactive and toxic waste is still affecting the Colorado River and the drinking water for the 25 million people who live downstream. DOE must do the right thing and end the debate.

Document #1405 Comment #1 - continued

Response:

The EIS analyzes the potential environmental impacts and projected costs of the on-site and off-site disposal alternatives. In the final EIS, DOE has identified off-site disposal at the Crescent Junction site using rail transportation and active ground water remediation as its preferred alternatives for the remediation of the Moab mill tailings, vicinity properties, and contaminated ground water. At least 30 days following the issuance of the final EIS, DOE will issue a Record of Decision that will state what its decision is, identify the alternatives considered by the agency, and state whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted and, if not, why they were not.
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Document #1430 Comment #1 Commentor: Darke, John

I'm happy to hear in your message that there is going to be a public hearing in January. I'm also happy that you're still receiving comments. This is a request: the DOE Grand Junction Office received e-mails suggesting that it was the appropriate in conformance and CEQ intent that the Initial Phase Investigation particularly be made available in the reading room and also in respect that some of the data set that is mentioned in that record, USGS record, it is there that the data set be made available. I would refer you to the USGS website and the link--the appropriate link indicates that in order to receive the data set is essentially to treat it as a commercial enterprise. Some can't afford $100 an hour or $70 or whatever. The download time of the initial investigation report itself is 48 megabytes. Its intent was to place copies have been received of the report at the courthouse. It was quite a delay until after the suspense on the comment period. Suggest that we lighten up in a group-phased effort to provide affordable records. This is John Darke.

Response:

DOE believes that the commentor is referring to a USGS report received after the draft EIS was issued. The report, Initial-Phase Investigations of Multi-Dimensional Streamflow Simulations in the Colorado River, Moab Valley, Grand County, Utah, 2004 (USGS 2005), was not available for the draft EIS. It has been used in preparing the final EIS and is available in the public reading rooms.

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Document #1432 Comment #1 Commentor: Gosnell, James

As I resident of San Diego, California, the current state of the uranium tailings pile concerns me. San Diego currently gets about two-thirds of its water from the Colorado River. This is the water that I use to wash laundry, drink, and bathe. Yet out in Moab, Utah a major health risk and threat to our water supply exists. The uranium tailing pile located in Moab is a diaster waiting to happen. Daily the pile leaks 15,000 agllons of toxic chemical chemicals into the river in a day, it could be easily subjected to a terrorist attack and used to poision the water in all of Southern California, Nevada, and Arizona. If it isn't attacked by terrorists a flood could easily wipe 80% of the pile into the river, spelling diaster for the Untied Sates Government and all citizens using the Colorado for a water supply.

Response:

DOE acknowledges the commentor's concern regarding the importance and use of the Colorado River as a downstream water supply and in the EIS has summarized the potential impacts from a tailings pile failure. DOE agrees that there is a possibility that at some point in the future, especially considering geologic time, the river will cross the Moab site. However, DOE's analyses conclude that engineering controls could be used to resolve this issue for the near term (200 to 1,000 years). In Section 4.1.17 of the EIS, a catastrophic failure of an on-site disposal cell is assumed and the impacts quantified. Additionally, the impacts of periodic flooding are assessed in Section 4.1.3.1. If on-site disposal were selected, the cell would include side slopes armored with riprap of sufficient size to resist erosion from floodwaters. The design would also include a barrier wall between the river and the capped pile to mitigate against river encroachment. These measures would further reduce the already low probability of catastrophic failure of an on-site disposal cell and further protect the water supply. The differing opinions over river migration are discussed in Section 2.6.4. Based on the analyses in the EIS and uncertainties such as those in the comment, DOE has identified off-site disposal at the Crescent Junction site as its preferred surface remediation alternative.

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Document #1432 Comment #2 Commentor: Gosnell, James

According to a recent survey by the US Deparment of Energy, the uranium tailing pile currently is not in compliance with EPA standards for Unarium concentration or Ammoniium concentration. The alloted uranium concentration is .04 mg per l; yet in some parts of the pile the concentration is as high as 15 mg per L. That is 37500% percent apove the EPA's accepted level! That kind of violation causes unneccesary stress to many concerned residents. Simularily, the ammonian level set by the EPA is 3mg per L; despite this alloted concentration the entire pile never drops below 50mg per liter. That figure is a staggering 1667% above the alloted EPA levels.

Response:

The commentor is correct that concentrations of uranium and ammonia are elevated in the ground water beneath the site. For this reason, DOE has already undertaken ground water interim actions to reduce contaminant migration. These actions include capturing and evaporating some of the most contaminated ground water from the legacy plume that is entering the Colorado River and reducing the contaminant seepage from the pile area that has potential to migrate into the ground water beneath the pile. These interim actions have proven to be very effective in significantly reducing the total mass of contaminants reaching the river.
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Document #1432 Comment #3 Commentor: Gosnell, James

I propose that the citizens of all areas drinking the Colorado river water, that is consistently poisioned by the Uranium tailings pile at Moab, Utah, petition for the pile to become part of the EPA Superfund Act. Superfund is the perfect solution because it will call for removing and clearing the waste at no cost to the victims of hazardous waste poisioning, even if that poisiong may not be lethal.

Response:

The commentor's proposal is noted and his support for off-site disposal will be considered, along with similar comments, when DOE selects the disposal site and method in the Record of Decision.
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Document #1501 Comment #1 Commentor: Eddy, Daniel Jr.—Colorado River Indian Tribes

On behalf of the Colorado River Indian Tribes (CRIT), I write regarding an issue that has potential to significantly impact the members of this tribe as well as a number of communities along the Colorado River for generations to come.

That issue involves the approximately 11.9 million tons of radioactive uranium tailings sitting on the banks of the Colorado River in Moab, Utah. This pile contains very high levels of radioactive and toxic materials that are already leaking into the river and if left unchecked, will have a detrimental effect on virtually everything downstream. This is especially alarming to us because our entire economy centers primarily on agriculture and tourism. Our very existence is therefore heavily dependent on the water quality of the Colorado River.

To remediate the site, the Department of Energy is currently considering three options. One is to move the tailings off the river to a secure and safe location north of Moab. A second is to cap and leave the pile in place. The third option is to send the radioactive and toxic material to a facility near White Mesa, Utah.

While none of the options considered offers any safe long-term solution, we stand with our Ute neighbors in opposition to relocating the material to the proposed White Mesa site. The White Mesa site is too close to the Ute reservation and is situated atop and next to ancient sites that have profound cultural and spiritual significance to the tribe. The site north of Moab makes the most sense and is preferred over the other two options.

Unquestionably, because of the tremendous presented threat, the pile must be removed away from the Colorado River. However, serious consideration needs to be given to the location of any potential dumpsite and its proximity to neighboring communities and any relevant cultural and spiritual sites.

Thank you for taking the time to hear our concerns and if you should have any questions in this regard, please feel free to contact me at the number provided above.

Response:

DOE's analyses in the EIS demonstrate that both the on-site and off-site disposal alternatives would offer safe, long-term solutions with varying degrees of certainty and impacts. Based on factors such as those identified in the comment, DOE has identified off-site disposal at Crescent Junction as its preferred alternative. DOE will continue to consider the public's comments for final decision-making.
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Document #1503 Comment #1 Commentor: Juan-Suanders, Vivian—Inter Tribal Council of Arizona

The Inter Tribal Council of Arizona, an organization of 19 Tribal governments, is hereby expressing its support of the Ute Mountain Ute Tribe and the City of Moab, Utah regarding remediation of the Atlas Mill Site. The approximate 11.9 million tons of uranium tailings now sitting on the banks of the Colorado River in Moab at said Site should be removed off the River to a secure and safe location north of Moab.

Response:

The Inter Tribal Council of Arizona's support for removing the tailings pile from the banks of the Colorado River is noted, and DOE will consider this and other opinions in its final decision-making.
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Document #1503 Comment #2 Commentor: Juan-Suanders, Vivian

A number of Indian Reservations, including the Quechan, Cocopah, Colorado River Indian Tribes, Havasupai and Haulapai, are directly located on the Colorado River within the geographic boundaries of the States of California, Arizona and Nevada, downriver from the Atlas Mill Site. The tribes have rights to the Colorado River stemming from the establishment of their reservations. The river is central to the culture and economy of each tribe. The release of hazardous substances into the River would threaten their subsistence and way of life. All member tribes of the ITCA join with the Ute Mountain Ute Tribe and the City of Moab in their opposition to any Atlas Mill Site remediation plan whereby the uranium tailings would remain in place on the River's bank. Even if the pile is capped, no guarantee can be given that contamination of the River, due to gradual leaking or catastrophic event such as flooding, will never occur. So long as the uranium tailings remain on the River's bank, a serious threat exists for all downriver communities and tribes as well as Moab.

Response:

DOE acknowledges the commentor's support for relocating the uranium tailings pile from its current location and will consider this comment in making its final decision regarding disposition of the tailings.

Regardless of whether, in the Record of Decision, DOE ultimately selects the on-site or the off-site disposal alternative, DOE is confident that the disposal cell would effectively isolate mill-related contaminants for the 200- to 1,000-year effectiveness period specified in 40 CFR 192. DOE is also confident that surface remediation combined with active ground water remediation and the final disposal cell design and construction would reduce the possibility of short-term and long-term impacts to human health and the environment to levels that would comply with the requirements of 40 CFR 192.
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Document #1503 Comment #3 Commentor: Juan-Suanders, Vivian

All of the named tribes have many cultural, traditional and sacred places both within and without their reservations. All too often, the United States contemplates or takes action without proper consideration of the depth and scope of the hurt and harm experienced by Native people by the destruction and desecration of sacred places. We join with the Ute Mountain Ute Tribe and the City of Moab in their opposition to any Atlas Mill Site remediation plan whereby the uranium tailings would be sent to a facility near White Mesa, Utah. The White Mesa facility is located near and/or at the Ute Reservation and sacred places with profound cultural and spiritual significance to the Ute Tribe.

The United States has a trust responsibility for all the above named Tribes. It should not allow or pursue any remediation of the Atlas Mill Site which disturbs the Reservations or sacred sites of these tribes in any way.

We strongly support the Ute Mountain Ute Tribe in its recommendation that Atlas Mills remove the uranium tailings off the Colorado River to a safe and secure location north of Moab. Remediation which threatens the Colorado River, such as capping the existing pile in place, or which disturbs Ute Mountain Ute Tribe sacred places, such as sending the tailings to White Mesa, should not be considered.

The 19 member Tribes of the Inter Tribal Council of Arizona urge you to take action as identified in this letter. Your attention to this matter is greatly appreciated.

Response:

See responses to comments #1 and #2. DOE has considered, and will continue to consider, the many comments received from Native Americans and other members of the public concerning protection of archaeological and sacred sites at White Mesa. The White Mesa Mill off-site disposal alternative is analyzed in the EIS because it is technically feasible; it could provide the benefit of co-location of uranium mill tailings waste; and the associated impacts may have the potential to be mitigated in an acceptable manner. NEPA requires that DOE consider all reasonable alternatives in the EIS.

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Document #1503 Comment #4 Commentor: Juan-Suanders, Vivian

RESOLUTION OF THE INTER TRIBAL COUNCIL OF ARIZONA
Title: Support of the Fort Mojave Tribe’s opposition to movement of uranium tailings to White Mesa, Utah

WHEREAS, the Inter Tribal Council of Arizona, a council of 19 tribal governments in Arizona, provides a forum for tribal governments to advocate for national, regional and specific tribal concerns and to join in united action to address these issues; and

WHEREAS, the member tribes of the Inter Tribal Council of Arizona have the authority to act to further their collective interests as sovereign native governments; and

Document #1503 Comment #4 - continued

WHEREAS, the member tribes of the Inter Tribal Council of Arizona support the sovereign right of Indian nations to protect their traditional lands, environments, sacred sites and cultural resources; and

WHEREAS, the Inter Tribal Council of Arizona has the charge to support and represent particular member Tribes on matters directly affecting them upon their request; and

WHEREAS, the Fort Mojave Indian Tribe is requesting support opposing the transfer of 11.9 million tons of uranium tailings presently located on the banks of the Colorado River in Moab, Utah to a facility in close proximity to White Mesa, Utah, and leaving the mine tailings capped or uncapped at its present location; and

WHEREAS, the uranium tailings now located on the banks of the Colorado River threaten not only the health and viability of the Colorado River but all communities specifically Ft. Mojave, Colorado River Indian Tribes, Hualapai, Havasupai, Quechan and Cocopah Tribes, downriver from the Atlas Mill site where the uranium tailings are presently stored; and

WHEREAS, the Ute Mountain Ute Tribe, the Fort Mojave Tribe and the above named tribes have many cultural, traditional and sacred places along the Colorado River, both within and in close proximity to their reservations and the release of or leaking from the tailings into the Colorado River or the relocation of the tailings to or near these sacred sites would have devastating effects on the Tribes' cultural, spiritual and traditional existence; and

WHEREAS, the White Mesa facility is located near the Ute Reservation and sacred sites culturally and spiritually significant to the Ute Mountain Ute people; and

NOW THEREFORE BE IT RESOLVED, that the Inter Tribal Council of Arizona supports the Ute Mountain Ute Tribal Council and the Ft. Mojave Tribal Council in their opposition to moving the mine tailings, contaminated soils and cover material from the Atlas Mill site in Moab, Utah to a facility near White Mesa, Utah; and

BE IT FURTHER RESOLVED, the Inter Tribal Council of Arizona opposes leaving the mine tailings capped or uncapped on the banks of the Colorado River.

BE IT FURTHER RESOLVED, that the Inter Tribal Council of Arizona requests that the United States Department of Energy remove the 11.9 million tons of uranium tailings off the banks of the Colorado River to a secure and safe location north of Moab.

BE IT FURTHER RESOLVED that the Executive Director of the Inter Tribal Council of Arizona forward this resolution to the U.S. Department of Energy and other pertinent agencies.

Response:

See response to comment #1.
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