FINAL ENVIRONMENTAL ASSESSMENT

FOR

DEPARTMENT OF ENERGY LOAN GUARANTEE TO FULCRUM SIERRA BIOFUELS, LLC FOR A WASTE-TO-ETHANOL FACILITY IN MCCARRAN, STOREY COUNTY, NEVADA

U.S. Department of Energy
Loan Guarantee Program Office
Washington, D.C. 20585

June 2011

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Summary

The U.S. Department of Energy (DOE) is considering whether to issue Fulcrum Sierra BioFuels, LLC (Sierra BioFuels) a loan guarantee for construction of a waste-to-ethanol facility (the Facility) for the production of ethanol from sorted[1] municipal solid waste (MSW) from which recyclables and non-biomass components have been removed (Feedstock). The Facility would be located entirely on approximately 16.77 acres of privately-owned land within the Tahoe-Reno Industrial Center (the TRI Center), in McCarran, Storey County, Nevada (the Site).

The DOE prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA; 42 United States Code [USC] 4321 et seq.), Council on Environmental Quality (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500−1508), and DOE NEPA implementing procedures (10 CFR 1021). The EA analyzes the potential environmental impacts of the Proposed Action and No Action Alternative and determines whether the Proposed Action would have the potential to result in significant environmental impacts. This EA provides the DOE with the environmental information to help decide whether to issue Sierra BioFuels a loan guarantee for the Facility.

Purpose and Need for Agency Action

The purpose and need for agency action is to comply with the DOE mandate under the Energy Policy Act of 2005 (Energy Act) by selecting eligible projects that meet the goals of the act. The DOE is using the NEPA process and this EA to help determine whether to issue Sierra BioFuels a loan guarantee to support construction and start-up of the proposed Facility.

The Energy Act, as amended by Section 406 of the American Recovery and Reinvestment Act of 2009 (ARRA), established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of the Energy Act authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases (GHGs); and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued." The two principal goals of the loan guarantee program are to encourage commercial use in the United States (U.S.) of new or significantly improved energy-related technologies and to achieve substantial environmental benefits by reducing reliance on fossil fuels and reducing GHG emissions.

Proposed Action and Alternatives

This EA evaluates the impacts associated with the Proposed Action and the No Action Alternative.

[1] MSW is sorted by a materials recycling facility (MRF), and the Facility will receive a selected stream of sorted MSW as Feedstock.

Proposed Action

Under the Proposed Action, Sierra BioFuels intends to construct and operate the Facility for the production of ethanol. The Facility would use state-of-the-art, non-combustion, thermochemical conversion technology to convert Feedstock into ethanol. Feedstock is composed of the organic component of MSW derived from the residual materials remaining after recycling operations are performed by the material recovery facility (MRF). Feedstock includes paper and paperboard, yard trimmings, food scraps, wood, plastics, containers and packaging (such as milk cartons and plastic wrap), and durable (such as furniture) and non-durable goods (such as paper and clothing). Inorganic materials removed from the Feedstock include ferrous and non-ferrous materials, glass, dirt, and concrete. Feedstock material is fed to a flat conveyor that serves as a pre-sort platform for spotting and manual removal of unwanted materials, including structural steel, propane bottles, polyvinyl chloride (PVC), and other identified non-organic materials. The feed is then processed through a primary shredder that reduces the size of each item to 4 inches or less (referred to as "4-inch minus"[2]). Further separation activities include the use of air streams, magnets, optical sensors, and gravity/screening separation.

The Facility is being designed to convert nearly 145,000 tons of Feedstock per year into 10.5 million gallons of ethanol and sufficient renewable electricity through self-generation for the Facility operations. The Facility will be configured with three synthesis gas (syngas) gasification production units, each composed of a down-draft gasifier, a patented Plasma Enhanced Melter™ (PEM™) system, a thermal residence chamber (TRC), and a heat recovery system (HRS). The syngas gasification production units will convert the Feedstock to an intermediate product, syngas. Once conditioned and further processed, the syngas will pass through a catalytic reactor to convert the syngas into an ethanol product. Within the ethanol synthesis process, excess carbon dioxide (CO_2) and other inert gases (such as hydrogen sulfide) would be removed to maintain the proper syngas composition. The remainder of the unconverted, methane-rich syngas from the ethanol synthesis process will be combusted in the turbine combined-cycle generator for the production of approximately 16 megawatts (MW) of renewable electricity to operate the Facility.

The Facility will be located entirely on 16.77 acres of privately-owned land within the TRI Center, in McCarran, Storey County, Nevada. There are no existing facilities or utilities on the Site, but the Site has been partially disturbed by clearing, grading, and the use of fill material prior to Sierra BioFuels' purchase of the property. A railroad line borders the property on the north and Peru Drive on the south, which provide both rail and truck/car access to the Site. The Facility and supporting infrastructure will occupy the entire 16.77-acre parcel, which will be fenced along the perimeter.

No Action Alternative

Under the No Action Alternative, the DOE would not provide a loan guarantee to Sierra BioFuels for construction of the Facility. In this scenario, the DOE assumes, for purposes of this EA, that the

[2] The designation of "4-inch minus" means four inches or less in any one direction. Given the performance of a modern shredder, most materials would be substantially smaller, and even the largest items will be much smaller than four inches in two of the three dimensions.

Facility would not proceed as scheduled without the Proposed Action, as the Facility's viability would remain uncertain. Although construction and operation of a waste-to-ethanol facility might be possible at the Site with alternative means of financing, that scenario is not analyzed because it would not provide for a meaningful No Action Alternative, as it would be identical to the Proposed Action.

Summary of Environmental Impacts

The anticipated effects of the Facility are summarized in **Table 1-1**. Detail regarding the affected environment and environmental effects is discussed in Chapter 3.0.

Table 1-1 Summary of Anticipated Facility Effects on the Environment

Environmental Resource	Anticipated Facility Effects		Section
Land Use and Special Management Areas	No effect	Anticipated land use and landownership would remain unchanged. No special management areas within the vicinity of the Facility.	3.2
Transportation Corridors, Infrastructure, and Utilities	Minimal effect	Minimal increases in vehicle trips on existing roads, railways, infrastructure, and utilities designed and upgraded to accommodate a large industrial center.	3.3
Surface Water	No effect	No potential for effects to surface water. Stormwater to evaporation pond, irrigation, etc.	3.4
Floodplains	No effect	The Site is not located in a flood zone or floodplain.	3.4
Wetlands	No effect	There are no federally designated wetlands located on or near the Site.	3.4
Groundwater	Negligible effect, permit required	The potential to contaminate groundwater would be negligible. Storm water and groundwater discharge permits required. No direct discharge to groundwater; permit is for retention basin.	3.4
Soils and Geology	No effect	No potential for impact to geology and soils at the Site.	3.5
Vegetation	Minimal effect	Removal of 16.77 acres of sagebrush vegetation and understory grasses in a partially disturbed area planned for industrial development.	3.6

Table 1-1 Summary of Anticipated Facility Effects on the Environment

Environmental Resource	Anticipated Facility Effects		Section
Wildlife and Fisheries	Minimal effect, protective measures	Removal of 16.77 acres of wildlife habitat and displacement of wildlife in a partially disturbed area planned for industrial development. Protective measures that limit habitat removal during migratory periods would be implemented.	3.7
Special Status Species	Minimal effect, protective measures	No impacts to Federally listed endangered species. No impacts to state listed or sensitive plant species. Minimal effects to state listed mammals and bird species from removal of 16.77 acres of habitat in a partially disturbed area planned for industrial development. Protective measures that limit habitat removal during migratory periods will be implemented.	3.8
Air Quality	Minimal effect, permit required	Impacts of emissions would not cause or contribute to an exceedence of an ambient air quality standard. Air quality "Operating Permit To Construct" (Permit No. AP 2869-2382) was issued August 23, 2010.	3.9
Cultural Resources	No adverse effect	November 2008 Class I files search survey done and SHPO consultation completed on February 14, 2011. No known cultural resources on site. If undiscovered cultural resources are found work will cease pending consultation with Tribes and SHPO.	3.10
Socioeconomics and Environmental Justice	Minimal effect	No adverse effects are anticipated to existing communities or populations. The addition of up to 53 fulltime jobs would benefit nearby communities.	3.11
Visual Resources	Minimal effect	Introduction of visual elements would be similar to other industrial developments at the TRI Center.	3.13
Noise	Minimal effect	Introduction of noise would be similar to other industrial developments at the TRI Center.	3.14

Table 1-1 Summary of Anticipated Facility Effects on the Environment

Environmental Resource	Anticipated Facility Effects		Section
Public Health and Safety	No effect	While a potential for spills and fire would exist at the Facility because of the nature of the operations, no effects from routine operations or accidents are anticipated from the Facility due to its remoteness from population centers and emergency preparedness measures.	3.15

Acronyms and Abbreviations

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
amsl	above mean sea level
AGFD	Arizona Game and Fish Department
AR-AFFF	alcohol-resistant aqueous film forming foam
ARC	Architectural Review Committee
ARPA	Archaeological Resources Protection Act
ARRA	American Recovery and Reinvestment Act of 2009
BCC	Birds of Conservation Concern
bgs	below ground surface
BLM	Bureau of Land Management
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe
BWM	Bureau of Waste Management
BWPC	Bureau of Water Pollution Control
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
DOE	U.S. Department of Energy
EA	environmental assessment
Energy Act	Energy Policy Act of 2005
ESA	environmental site assessment
ESFR	early suppression first response
Feedstock	sorted municipal solid waste (MSW) from which recyclables and non-biomass components have been removed
ft^3	cubic feet
g	Gravity
g/MJ	grams/Mega-Joule
GHG	greenhouse gas

H_2S	hydrogen sulfide
HAP	hazardous air pollutant
HMIS	Hazardous Materials Inventory Statement
HRS	heat recovery system
HRSG	heat recovery steam generator
I-80	Interstate 80
IPCC	Intergovernmental Panel on Climate Change
kV	Kilovolts
MBTA	Migratory Bird Treaty Act
MDEA	Methyl Diethanol Amine $CH_3N (C_2H_4OH)_2$
MRF	Material Recovery Facility
MSDS	material safety data sheet
MSW	municipal solid waste
MW	Megawatts
NAGPRA	Native American Graves Protection and Repatriation Act
NDEP	Nevada Division of Environmental Protection
NDOW	Nevada Division of Wildlife
NEPA	National Environmental Policy Act
NGS	National Geographic Society
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NV-SP	Nevada state protected
NV-SPS	Nevada state protected sensitive
P&ID	piping and instrumentation diagram
PEM™	Plasma Enhanced Melter™
PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million
PVC	polyvinyl chloride
SCFD	Storey County Fire Department

SCR	selective catalytic reduction
SHPO	State Historic Preservation Officer
Sierra BioFuels	Fulcrum Sierra BioFuels, LLC
SO_2	sulfur dioxide
SOP	Site Operating Plan
SUP	Special Use Permit
SWPPP	Storm Water Pollution Prevention Plan
SWReGAP	Southwest Regional Gap Analysis Project
syngas	synthesis gas
The Facility	Waste-to-ethanol facility
The Site	McCarran, Storey County, Nevada
TRC	thermal residence chamber
TRI Center	Tahoe-Reno Industrial Center
TRIGID	TRI General Improvement District
$\mu g/m^3$	micrograms per cubic meter
UP	Union Pacific
USC	United States Code
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Waste Connections	Waste Connections of California, Inc.
Waste Management	Waste Management of Nevada, Inc.

1.0 Purpose and Need

1.1 Purpose and Need

The Energy Policy Act of 2005 (Energy Act), as amended by Section 406 of the American Recovery and Reinvestment Act of 2009 (ARRA), established a federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of the Energy Act authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases (GHGs); and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued." The two principal goals of the loan guarantee program are to encourage commercial use in the United States (U.S.) of new or significantly improved energy-related technologies and to achieve substantial environmental benefits by reducing reliance on fossil fuels and reducing GHG emissions.

Fulcrum Sierra BioFuels, LLC (Sierra BioFuels) submitted an application to U.S. Department of Energy (DOE) under the federal loan guarantee program pursuant to the Energy Act to support construction of a waste-to-ethanol facility (the Facility) for the production of ethanol from sorted[3] municipal solid waste (MSW) from which recyclables and non-biomass components have been removed (Feedstock). The Facility would use state-of-the-art, non-combustion, thermochemical conversion technology to convert Feedstock into ethanol. The Facility is being designed to convert nearly 145,000 tons of Feedstock per year into 10.5 million gallons of ethanol, and sufficient renewable electricity through self-generation for the Facility operations. The Facility would be located on approximately 16.77 acres of privately-owned land within the Tahoe-Reno Industrial Center (the TRI Center), in McCarran, Storey County, Nevada (the Site).

The purpose and need for agency action is to comply with the DOE mandate under the Energy Act by selecting eligible projects that meet the goals of the act. The DOE is using the National Environmental Policy Act of 1969 (NEPA) process and this Environmental Assessment (EA) to help determine whether to issue Sierra BioFuels a loan guarantee to support the proposed Facility.

The Facility would be designed to produce approximately 10.5 million gallons[4] of ethanol per year. The Facility would reduce the need for fossil based fuel, thereby significantly reducing GHG emissions and other pollutants that are harmful to the environment and human health. The 10.5 million gallons of ethanol produced by the Facility annually would avoid emissions of carbon dioxide by more than 66,700 metric tons if an equivalent amount of non-renewable fuel was produced using petroleum.

[3] MSW is sorted by a materials recycling facility (MRF), and the Facility will receive a selected stream of sorted MSW as Feedstock.

[4] While the design capacity of the Facility is for 10.5 million gallons, the air permit allows up to 16,311,500 gallons per year, based on a potential to convert all syngas to ethanol. The redesigned plant includes use of the syngas as feed to the combustion turbine to produce electric power for consumption on site.

1.2 Background

The Energy Act established a federal loan guarantee program for eligible energy projects that employ innovative technologies. The two principal goals of the program are to encourage commercial use in the U.S. of new or significantly improved energy related technologies and to achieve substantial environmental benefits. The DOE believes that commercial use of these technologies would help sustain and promote economic growth, produce a more stable and secure energy supply and economy for the U.S., and improve the environment. The DOE published a Final Rule that establishes the policies, procedures, and requirements for the loan guarantee program (10 Code of Federal Regulations [CFR] Part 609). In June 2008, the DOE issued a solicitation announcement inviting interested parties to submit proposals for projects that employ energy efficiency, renewable energy, and advanced transmission and distribution technologies that constitute New or Significantly Improved Technologies (as defined in 10 CFR 609). Sierra BioFuels submitted a Part II Submission of its loan guarantee application to the DOE on May 14, 2010.

On November 24, 2010, the DOE made a formal determination that an EA was the appropriate level of environmental review for the proposed action and sent a notification letter to the Nevada State Clearinghouse, Department of Administration. DOE's letter of intent to prepare the EA is provided in Appendix A. Copies of the letter were also sent to six Native American Tribes who have expressed an interest in proposed Federal projects in Storey County, NV. The letter described the proposed action and stated that a draft EA would be sent to the state for review. On December 28, 2010 DOE sent a letter to the Tribes extending them an opportunity to engage DOE in government to government consultation on the project.

1.3 Scope of the Environmental Assessment

This EA provides information about the potential impacts associated with issuing Sierra BioFuels a loan guarantee for the construction and start-up of the Facility. DOE prepared this EA in accordance with NEPA (42 United States Code [USC] 4321 et seq.), Council on Environmental Quality (CEQ) NEPA implementing regulations (40 CFR 1500-1508), and DOE NEPA implementing procedures (10 CFR 1021).

This EA: 1) describes the affected environment relevant to potential impacts of the Proposed Action and No Action Alternative; 2) analyzes potential environmental impacts that could result from the Proposed Action; 3) identifies and characterizes cumulative impacts that could result from the Proposed Action in relation to other ongoing or proposed activities in the surrounding area; and 4) provides the DOE with environmental information for use in decisionmaking to protect, preserve, and enhance the human environment and natural ecosystems.

2.0 Proposed Action and Alternatives

Two alternatives are considered for analysis: the Proposed Action (Section 2.1) and the No Action Alternative (Section 2.2). This chapter describes both alternatives, as well as alternatives considered but eliminated from analysis (Section 2.3).

The decision for DOE consideration covered by this NEPA review is whether or not to approve the loan guarantee for the Sierra BioFuels waste-to-ethanol facility (the Facility). The Site selected by Sierra BioFuels would be compatible with the proposed use and would be supported by state and local approvals (see **Table 2-3**). Further, there are no unresolved conflicts concerning alternative uses of available resources associated with the Site that would suggest the need for other alternatives (40 CFR 1508.9(b)). Therefore, other than the No Action alternative, there is no alternative to the proposed action considered in this NEPA review.

2.1 Proposed Action

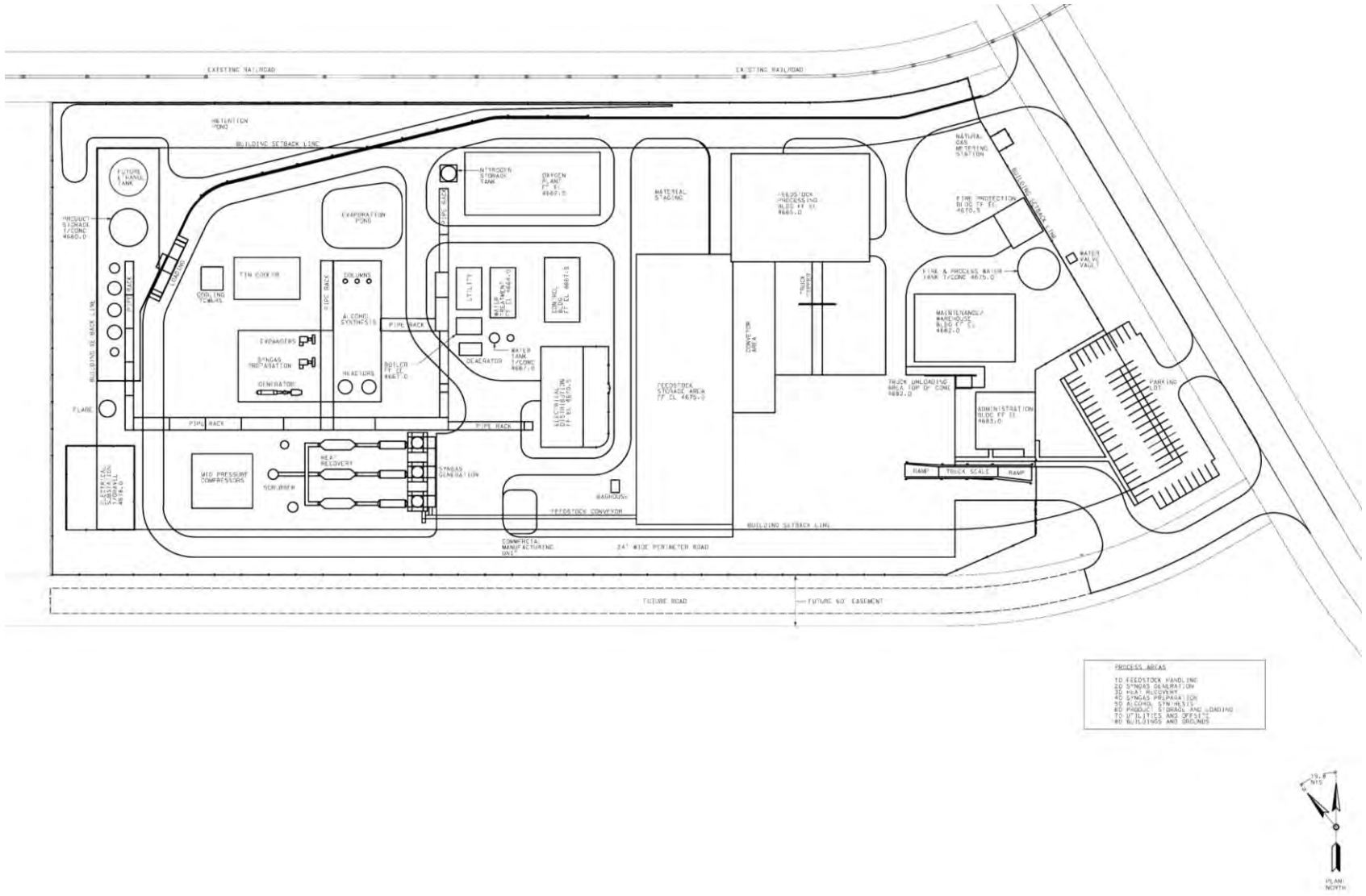
Sierra BioFuels intends to construct and operate the Facility for the production of ethanol from sorted MSW from which recyclables and non-biomass components have been removed . The Facility would be located on approximately 16.77 acres of privately-owned land within the TRI Center. The Site is located at 3600 Peru Drive, McCarran, Storey County, Nevada. There are no existing facilities or utilities on the Site, but portions of the Site have been previously disturbed with grading activity. Bordering the property is an existing railroad spur on the north and Peru Drive on the east. The Site is further described in Chapter 3.0. The Facility and supporting infrastructure would comprise the entire 16.77-acre parcel, which would be cleared, graded, and fenced along the perimeter. The Facility is depicted in **Figure 2-1** and a more detailed plan for the Facility is depicted in **Figure 2-2**. The Facility would be constructed on a Site zoned "I-2 Heavy Industrial Zone" as specified in Storey County Zoning Ordinance Code §§17.37.050 to 17.37.080. A Special Use Permit issued by the Storey County Planning Commission (APN Number 004-153-69, dated May 28, 2008) authorizes an exception to the 75-foot building height limitations based on the original Facility design, but the current Facility design does not include buildings above 75 feet in height.

2.1.1 Facility Components and Process

The Facility's gasification process uses a thermochemical technology to convert Feedstock into ethanol through a chemical reaction in an oxygen-lean, non-combustion environment. The Facility will use state-of-the-art technology to convert MSW residual materials remaining after recycling operations into ethanol. The Facility is designed to convert nearly 145,000 tons of Feedstock per year into 10.5 million gallons of ethanol and to generate renewable electricity sufficient for operation of the Facility.

Figure 2-1 Proposed Sierra BioFuels Waste to Ethanol Conversion Facility

Figure 2-2 Sierra BioFuels Waste to Ethanol Conversion Facility Detailed Plan



The process would first convert Feedstock into synthesis gas (syngas).[5] The Facility would be configured with three syngas gasification production units, each composed of a down-draft gasifier, a Plasma Enhanced Melter™ (PEM™) system, a thermal residence chamber (TRC), and a heat recovery system (HRS). The syngas would then be conditioned and further processed and then passed through a catalytic reactor for conversion into an ethanol product. Within the ethanol synthesis process, excess carbon dioxide (CO_2) and other inert gases (such as hydrogen sulfide [H_2S]) will be removed to maintain proper syngas composition. The remainder of the unconverted, methane-rich syngas from the ethanol synthesis loop process would be combusted in a turbine combined-cycle generator for the production of approximately 16 megawatts (MW) of renewable electricity. The Facility will include the following components:

- *Buildings*. Eight separate buildings will be constructed for administrative offices, security, maintenance and warehousing, fire protection, Feedstock processing, Feedstock storage, chiller equipment, and the central control room.
- *Parking and Roadways*. A 30,000-square-foot parking area will be constructed near the administrative buildings on the east side of the parcel off the main access point to the Facility, Peru Drive. Access roadways and staging areas will also be constructed throughout the 16.77-acre property.
- *Fencing*. Except for a parking lot in front of the main administrative office, the entire Facility will be enclosed within a security fence.
- *Firewater Storage, Pumping, and Associated Fire Hydrants and Monitors*. There will be two firewater pumps, one electric and one diesel driven. Space within the fire protection building will be provided to the local fire department for storage of equipment and supplies needed to fight ethanol and other fires.
- *Packaged Boiler*. A small package boiler will supply start up and shutdown steam and assist with soot blowing[6] of the heat recovery steam generator (HRSG) equipment. Boiler water treatment chemicals and equipment storage will also be provided.
- *Air compressors and dryers*.
- *Closed Circuit Cooling Water System*. This system will include an array of fin-fan water cooling systems to provide air cooling at the Facility. The circulating water is treated to prevent corrosion and biological growth. This is a closed circuit water system and the only additional water required will be to make up for losses due to leakage.
- *Emergency Power Generation*. This system includes one diesel powered generator to provide electricity during a power outage in the event of an emergency shutdown.

[5] Syngas is composed of (by volume) about 35 percent carbon monoxide, 53 percent molecular hydrogen, 10 percent carbon dioxide, and 2 percent of other trace gases.

[6] Soot blowing refers to a process of sending a pulse of air through a boiler system, usually boiler tubes, to dislodge accumulated soot on the boiler tubes and internal boiler walls.

- *Nitrogen*. A nitrogen system will be provided for purging the equipment of residual chemicals. The system includes a cryogenic liquid nitrogen storage tank and atmospheric vaporizers to evaporate the liquid to gas.
- *Natural Gas Distribution System*. Natural gas will be supplied to the Facility's natural gas metering station by the local natural gas utility. The natural gas will be distributed throughout the Facility for use in running the process equipment and the package boiler and for use as a pilot light in the flare.
- *Oxygen Plant*. Oxygen is used by the process as part of the syngas preparation. A stand-alone gaseous oxygen plant will provide 93 percent pure oxygen for this function.
- *Wastewater Treating*. Water that is not recycled back into the process for reuse or discharged to the industrial sewer would be treated and sent to an evaporation pond. The primary source of this water will be the blow down from the scrubbing system. The evaporation pond will be sized to allow annual cleaning.
- *Electrical Power Generation, Transformation, and Distribution*. Electric power will be provided to the Facility by the on-site combustion turbine. Alternative or backup electric power will be provided to the Facility's switchyard by the local electric utility. The Facility would receive electric power at 120 kilovolts (kV) and would be stepped down to various voltage levels for use throughout the Facility.
- *Truck Scales*. Truck scales will weigh all the trucks and containers entering and leaving the Facility.
- *Storm Water Retention Pond*. A retention pond will be designed and built to retain runoff water equivalent to a 100-year storm. The water will be retained and tested prior to discharge through a treatment device into the TRI Center storm water collection system.

2.1.2 Construction and Transportation Infrastructure

Construction of the Facility is described in the following sections.

2.1.3 Facility Construction

Conventional construction materials (lumber, miscellaneous small parts, concrete) and construction equipment (graders, backhoes, cranes) will be used in constructing the Facility. Construction materials and equipment will be delivered to the Site via truck or rail. The Facility will be constructed in one phase over 13 months, with additional time needed for mobilization and commissioning (approximately four additional months). Construction is expected to commence in July 2011 and the Facility is expected to reach commercial operation in December 2012.

2.1.3.1 Construction Materials

Construction materials (lumber, miscellaneous small parts, concrete) for buildings would be purchased by the local construction contractors from suppliers in the area of the Facility. Deliveries to the Site would be by truck using existing surface roads.

2.1.3.2 Construction Water

Construction water for use in dust control, soil compaction, etc., will be supplied from the TRI Center's existing water supply system installed adjacent to the Site in the alignment to Peru Drive. This water will be used for dust control, compaction, and temporary construction activities, (e.g. filing water lines, flushing water lines and portable toilet trailers, etc.). The construction contractor will provide the required water lines to connect to an approved backflow preventer and hydrant meter to the water supply. TRIGID will read the meter and bill Sierra BioFuels for actual water consumption during construction. Although two water trucks are expected to be used at the Site, it is assumed that approximately 1.7 million gallons of water will be consumed over the 52-week construction period, equivalent to one 5,500-gallon water truck load each construction day. In addition, minor volumes of water (anticipated to be less than 50,000 gallons) will be used for hydrostatic testing of tanks and piping but will be re-used several times before discharge to the evaporation pond. Potable water for construction personnel would come either from the TRI General Improvement District's (TRIGID) existing potable water system in the Peru Drive alignment or from local area suppliers of bottled drinking water.

Sanitation wastewater would be discharged to the TRI Center sanitary sewer system. Construction waste water will be contained on-site within a retention basin. Water in the retention basin would be left to evaporate or, if needed, tested and released to the TRI Center storm water system.

2.1.4 Facility Operation

This section details the process that would be employed during operation of the Facility. A Design Report and a Site Operating Plan (SOP) have been developed at the request of the Nevada Division of Environmental Protection (NDEP), Bureau of Waste Management (Sierra BioFuels 2010a, b) as part of the Facility's application for a solid waste permit.

The Facility will receive and process approximately 145,000 tons of Feedstock each year. The Facility will convert the Feedstock to produce approximately 10.5 million gallons of ethanol annually and to generate renewable electricity required for Facility operations. The Facility will operate 24 hours a day, 365 days per year. As presently designed, the Facility has an estimated operational life of 25 to 30 years.

2.1.4.1 Feedstock

Feedstock Defined

The Facility's Feedstock would consist of sorted MSW from which recyclables and non-biomass components have been removed. Feedstock would be composed of carbonaceous and inorganic materials. The carbonaceous (organic) fraction includes paper and paperboard, yard trimmings, food scraps, wood, plastics, containers and packaging (such as milk cartons and plastic wrap), and durable (such as furniture) and non-durable goods (such as paper and clothing). The inorganic materials removed from the Feedstock include ferrous and non-ferrous materials, glass, dirt, and concrete.

Sierra BioFuels would draw its Feedstock initially from solid waste material recovery facilities (MRF) in northern California. These MRFs receive MSW, then sort and process the waste to remove recyclable materials based on the available commercial markets for such products. The recyclable

materials are either separated by the customers themselves – typically at homes and offices – or by the MRFs. Prior to sending material to the Facility, Sierra BioFuels' solid waste partners would divert available recyclable materials at their own facilities following the high recycling standards that prevail in California. Sierra BioFuels will require that Feedstock delivered to the Site not contain, the following materials, which will not be accepted by the Facility:

- Regulated Hazardous Waste (as defined by NAC 44.843);
- Polychlorinated Biphenyl Waste;
- Bulk or Noncontainerized Liquid Waste;
- Sludges and Other Wastewater Treatment Solids;
- Radioactive Waste;
- Asbestos and asbestos-containing materials; and
- Source Separated Special Waste (used tires, medical waste, used oil and filters, batteries), except such Special Waste deemed to be "Household Waste" that has been processed by MRFs during their normal course of business that may be commingled in the Feedstock and accepted.

Following the removal of recyclables by Feedstock suppliers, the residual waste material will be trucked to the Facility, where it will be tipped on the receiving floor and examined. The Facility's front-end processing system and operations personnel would remove inorganic waste and the "fines" – small shards of waste less than 1 inch in diameter – from the Feedstock and send those materials to the nearby Lockwood landfill. The remaining carbonaceous material will be relatively dry, consisting of 15 to 25 percent moisture, a level similar to wood-based feedstocks. This sorted MSW will then be screened for ferrous and nonferrous metals using magnet separators and eddy currents to remove those metals. Metals that are removed will be sent to scrap metal companies for recycling.

Finally, the sorted MSW will be shredded to a size of 4 inches or less in all dimensions and fed into the gasifier. Any remaining inert material that enters the gasifier, including fines, grit, and smaller inorganics that are not screened out by the Facility's front-end processing system, will be encapsulated in a vitrified byproduct that is non-leachable and can be recycled into road aggregate or cement products, or simply land filled, depending on the available markets for such material.

Feedstock Deliveries

Feedstock will be delivered by trucks with trailers that mechanically tip into receiving bins, or by construction style roll-off trailers. A truck scale near the main entrance gate will weigh each delivery prior to unloading. The Facility would be open to accept Feedstock deliveries 24 hours per day, 7 days per week; however, it is expected that deliveries will normally be carried out 5 days per week (see 2.1.4.12 below for more detail). A frame-tilt hydraulic tipping system will off-load Feedstock at the Feedstock processing building. The Facility Feedstock processing system will be able to presort, size, and sort as much as 73 tons of Feedstock per hour.

Presort

The presort process is designed to remove materials that are too large or difficult to resize. A mobile front-end loader with a grapple device will remove the objects and place them in a reject dumpster

for delivery to a landfill. The loader will also remove large objects to prevent them from reaching the feed bin. The material will then move onto a conveyor where a self-cleaning scalping roll will level the material on the conveyor apron conveyor to a consistent depth. A metal detector on the feed conveyor will detect large metal objects.

Sizing and Sorting

The feed conveyor will transport the presorted Feedstock to the shredder/hammer mill for sizing to the required Feedstock specifications. The shredder/hammer mill will be able to process up to 73 tons per hour. An eddy current will use a stream of air to separate nonferrous metals from the Feedstock. An optical sorter will identify and remove polyvinyl chlorides (PVCs) from the sized Feedstock. A cross belt magnet suspended above the magnet feed conveyor will remove ferrous metal of a 0.5-inch or greater. All rejected materials will be discharged into containers, dumpsters, or trucks for recycling or disposal.

Processed Feedstock Storage and Handling

The Feedstock storage building is designed to store 1,000 tons of processed Feedstock (approximately 2 days of gasifier feed). A front-end loader will be used to place the Feedstock in storage piles and to load the processed Feedstock into a Feedstock feed hopper (**Figure 2-3**). The feed hopper will be sized to provide 20 minutes of processed Feedstock to the gasifiers at a design feed rate of 420 tons per day. A moving floor in the bin will transfer the processed Feedstock to a scalping apron conveyor that meters and delivers the Feedstock to the three gasifier metering bins. Feedstock that is not discharged into one of the bins will fall onto a return conveyor and will be sent back to the front end of the distribution drag conveyor.

Each gasifier metering bin has a capacity of 250 cubic feet (ft^3). The metering bins are cone-shaped with a large diameter at the bottom to avoid clogging the discharge mechanism. After the metering bin is filled, a live bottom screw discharges the Feedstock from the metering bin to an airlock screw conveyor in a chamber where the Feedstock will be compressed to form a "barrel-plug." When the barrel plug chamber is filled, an airlock valve is closed at the feed end of the chamber, after which a second valve is opened from the chamber to the gasifier. This two-step airlock acts to prevent hot gasses from back flowing from the gasifiers into the bins. A lump breaker would mechanically break up the "barrel-plug" as the Feedstock is transferred to the gasifier.

Feedstock Supply

Sierra BioFuels has entered into a 20-year resource recovery supply agreement (Feedstock Agreement) with Waste Connections of California, Inc. (Waste Connections), a nationally recognized waste service company, to provide up to 100 percent of the Facility's Feedstock requirements for the Facility. A ready supply of Feedstock will be available to the Facility on a first priority basis from Waste Connections' Western El Dorado MRF located in Placerville, California. Under the terms of the Feedstock Agreement, Waste Connections would deliver up to 1,750 tons of Feedstock by truck, per week.

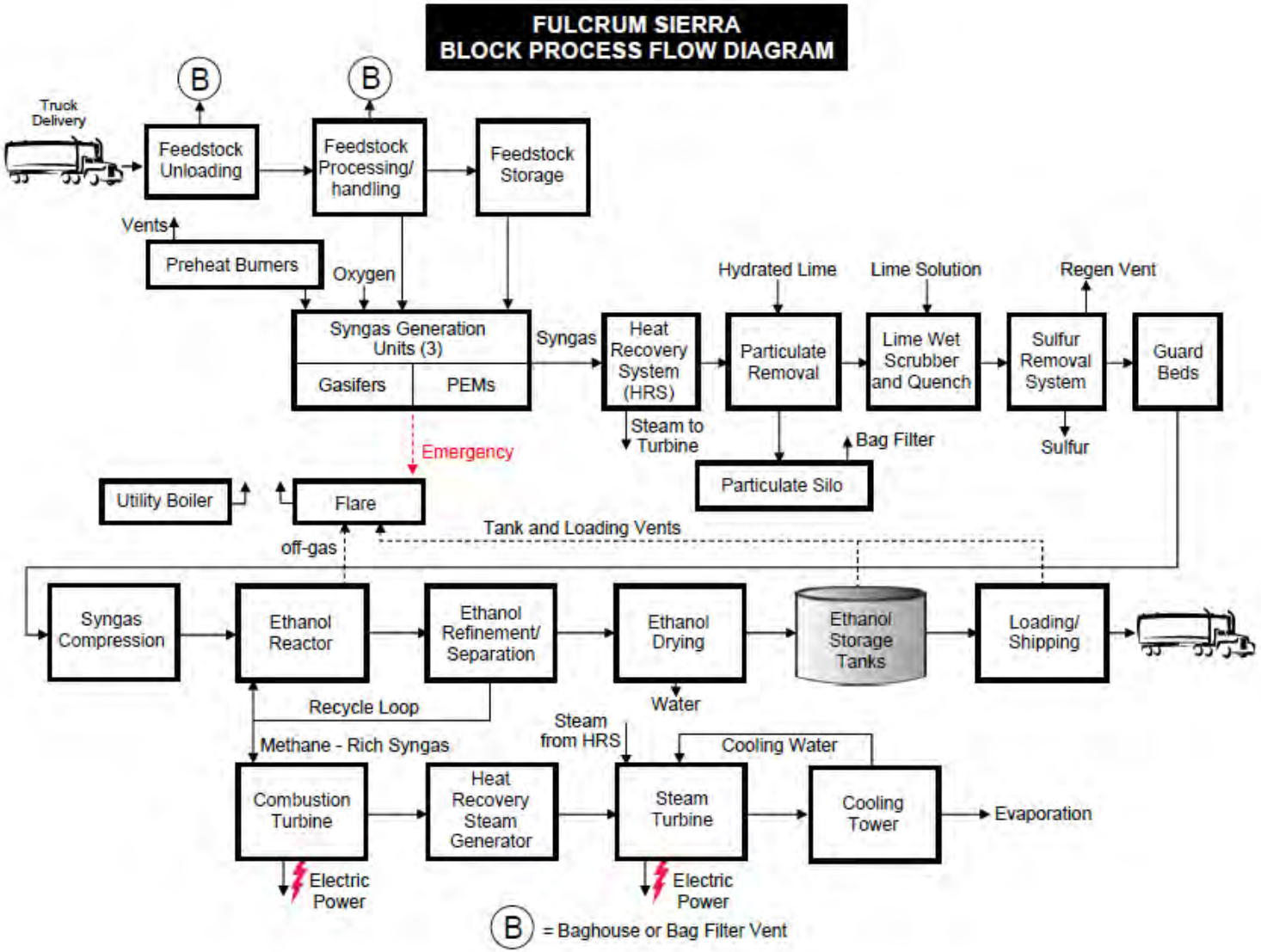
Sierra BioFuels has entered into a second long-term Feedstock supply agreement with Waste Management of Nevada, Inc. of Reno, Nevada (Waste Management). Waste Management can supply

up to an additional 2,000 tons of Feedstock per week for 15 years from the Commercial Operation Date of the Facility with an opportunity to extend an additional 5 years.

2.1.4.2 Synthesis Gas Gasification Production Units

The Facility would be configured with three syngas gasification production units, each composed of a gasifier, a PEM™ system, a TRC, and a HRS.

Figure 2-3 Block Process Flow Diagram



2.1.4.3 Gasifier

The Facility's gasification process is a thermochemical technology, designed to convert Feedstock into marketable products using a chemical reaction in an oxygen-lean, non-combustion environment. The Facility's gasification process will convert the Feedstock into syngas, which is further conditioned and processed to produce ethanol and other co-products, as described below. The majority of the Feedstock would be converted into syngas in the gasifier. The entire gasification train operates in an oxygen-lean environment. Any remaining non-gasified material will be further processed in the PEM™ system.

2.1.4.4 PEM™ System

The PEM™ system is a patented plasma-arc system that processes any organic material that has not been gasified in the gasifier. The PEM ™ system uses a high-voltage electric arc which is passed through the material to create hot plasma, in which the organic material is decomposed into smaller organic molecules. This step accomplishes both the gasification of organic molecules and the vitrification or inorganic materials. The remaining un-reacted inorganic materials melt and form a molten glass pool at the bottom of the PEM™ chamber. Bulk metals, if present, are converted into a mixed metal alloy. The inorganic materials, called vitrate, and metal are removed in the molten state and cooled. The vitrate contains environmentally stable material that is non-leachable and can be used in a number of products, such as construction materials, or if necessary, disposed of in accordance with applicable local, state, and federal regulations in a non-hazardous classified landfill. The metal recovered is recycled to the metals industry.

2.1.4.5 Thermal Residence Chamber (TRC) and Heat Recovery System (HRS)

The syngas streams from both the gasifier and the PEM™ system will next be routed to the TRC where the additional residence time and controlled feed of oxygen allows the gasification reactions to break down the larger complex organic molecules into the desired mix of syngas components. The syngas discharged from each TRC contains a mixture of hydrogen, carbon monoxide (CO), CO_2, nitrogen, steam, acid gases, and particulate. This hot syngas leaves the TRC and flows into a dedicated HRS. The HRS recovers heat from the syngas to pre-heat the feed gas stream entering the synthesis reactors.

2.1.4.6 Synthesis Gas Cleaning

The syngas derived from the syngas gasification system is next ducted to the syngas cleaning process to be dried to remove particulates and moisture, neutralized, filtered to remove trace contaminants, and compressed. These materials must be removed at this stage in order to meet feed specifications for the ethanol reactor, and to minimize emissions from the syngas-fired turbine. The syngas will be compressed to an intermediate pressure prior to sulfur removal. Sulfur is removed using an absorption process that produces a sulfur slurry that is then filtered into a sulfur product. The resulting sulfur will either be sold or disposed. Also at the intermediate compression stage, activated carbon guard beds would remove any remaining contaminants, such as mercury, lead, and hydrogen chloride, to protect the downstream the alcohol synthesis catalyst (as described in the next subsection). The guard beds will be periodically removed and recycled by the bed provider. The syngas will be compressed to a higher pressure prior to entering the alcohol synthesis loop to produce alcohol.

2.1.4.7 Ethanol Production

The conditioned gas will pass through a catalyst bed within the catalytic reactor to convert the syngas into an ethanol product. Within the ethanol synthesis loop process, excess CO_2 and other inert gases (such as hydrogen sulfide) will be removed to maintain the proper syngas composition. The ethanol product will then be cooled and condensed prior to entering the alcohol separation equipment to remove excess water and any other alcohol compounds (which are recycled to the reactor for continuous processing) before being sent to aboveground storage tanks to await shipment to market. The storage tanks will be located in a diked area to provide secondary containment in the event of a leak.

2.1.4.8 Combustion Turbine Combined-Cycle Generator

Syngas that is not converted to ethanol in the ethanol synthesis process will be fed to the Facility's combined cycle generator plant. In addition to providing steam for electric power by burning syngas the exhaust from the turbine will be routed to a heat recovery system generator (HRSG) that will generate steam to feed a steam turbine that, will, in turn, also power an electric generator. The combination of this one "fired source," i.e., the gas-fired turbine, connected to two separate generators is referred to as a combined cycle generator. This unit will be operated to produce up to 16 MW of renewable electricity for use at the Facility.

Gas Turbine

The gas turbine would be a nominally rated 6.5 MW, dual-fueled, Solar Taurus^{TM} 70 gas turbine, at 50 degrees Fahrenheit (°F) and site elevation of 4,600 feet above mean sea level, equipped with inlet evaporative cooler. The primary fuel would be methane-rich syngas from the alcohol production unit. The syngas also contains H_2 and CO. Natural gas would be used during the start-up and shut-down periods of the gas turbine.

Heat Recovery Steam Generator (HRSG)

The hot turbine exhaust from the gas turbine would be routed to a HRSG, which captures heat from the exhaust to generate steam. The HRSG consists of a boiler generating 800 pounds per square inch, gauge (psig) saturated steam that will then be further heated to raise the steam temperature to 750°F. The HRSG exhaust will be equipped with a selective catalytic reduction (SCR) system for the control of nitrogen oxides and a CO catalyst system for the control of CO.

Steam Turbine

Steam produced by the HRSG will be commingled with the steam produced by each of the three syngas generation unit HRSs and ducted to a steam turbine. The steam turbine will be connected to a separate electric power generator with a maximum output rating 8.9 MW, thereby providing a second source of renewable energy.

2.1.4.9 Operations Process Water

Process water will be supplied by the TRI General Improvement District (TRIGID). The TRIGID has been created to own, maintain, and operate the community water system to customers in the TRI Center. TRIGID's water resources come from groundwater approved by existing state permits and

pumped from wells in the TRI Center. TRIGID constructs additional wells, tanks, and distribution lines as further development occurs in the TRI.

The Facility is expected to have a consumptive water rate for industrial use of approximately 100 gallons per minute, which would be secured through a one-time purchase of 155 acre-feet per annum of water for use on the Site. The TRI Center has represented and warranted that it and TRIGID have sufficient uncommitted reserves of non-potable water and has issued a "will-serve" letter to Sierra BioFuels. Sierra BioFuels and TRIGID acknowledge that to the extent possible, water needs would be met through the use of non-potable or reclaimed water if or when it becomes available if it meets the water specifications in Sierra BioFuels' water purchase agreement. The "will serve" agreement also includes an additional 8.39 acre-feet of potable water water per annum, i.e., an additional 0.5 acre-feet per annum per acre of potable water that came with the purchase of the land. For domestic water use (not including fire flow and fire demand), TRIGID would provide the Facility with approximately 16.7 gallons per minute of potable water at 40 pounds per square inch, with 500 gallons per day of storage, with a peaking factor of 2. TRIGID also would furnish a system for fire protection with a minimum fire water flow from hydrants of 3,000 gallons per minute for 3 hours. The Facility would have a 600,000-gallon fire water storage tank on-site as well.

Process water would be stored in tanks. Toward the end of the construction activities, the water tanks will be tested for structural integrity. Clean water supplied by TRI Center would be used to fill the first tank. To minimize water consumption, subsequent tanks will recycle this water through a process water cleanup to a process water feed tank. Any water that is drained from the water processing/cleaning system would collect in the site retention basin and either evaporate or, if necessary, it will be tested prior to discharge.

2.1.4.10 Industrial Materials

Industrial materials used or produced by the Facility and the storage methods and quantities stored on site are shown in **Table 2-1**. Initial chemical supplies would be purchased based upon usage recommendations from the equipment suppliers. The Facility would purchase and store chemicals in two size categories, specialty chemicals and bulk chemicals. The specialty chemicals would be purchased in small quantities (i.e., less than 100 lbs) and stored in their original packaging in secured cabinets. Bulk chemicals would be purchased in large quantities and stored in aboveground storage tanks, totes, or bins designed for holding such chemicals. The expected industrial chemicals at the Facility include:

- *Hydrated Lime*. Hydrated Lime is mixed with water and fed to a spray system that removes acid gases from the syngas. This lime feed would be a bulk purchase item and typically delivered in trucks.
- *Sodium Hydroxide (Caustic).* Caustic is purchased in liquid (50 percent concentration) form as a bulk commodity and stored in a separate tank. Caustic would be used in treating water for balancing the pH of the water supply during processing and recycling.
- *Sulfuric Acid*. Sulfuric Acid would be purchased as a bulk commodity in liquid form (93 percent concentration) and stored in a separate tank. It would be used in water treating and cooling tower pH control.

- *Sulfur Removal Chemicals*. Depending on the initial quantities, these may be purchased in bulk if appropriate. Quantities for periodic make-up are expected to be purchased in small containers for use in the syngas scrubbing system. The chemicals are expected to be similar to the conventional amine scrubber system that is installed in many petroleum and natural gas refining facilities, but may be based on an advanced design of a better performing unit.
- *Boiler Water Treatment Chemicals*. Boiler water treatment chemicals will be purchased in special, returnable containers from the company providing the water treatment services.
- *Catalysts*. The catalyst would be purchased in drums. Spare catalysts will not typically be stored on-site since catalyst replacement would be scheduled in advance. Replacement catalysts would be ordered from the catalyst supplier as needed.
- *Lube Oil*. Lube oil would be supplied in drums and stored.
- *Glass (cullet).* The glass cullet would be purchased in bulk and stored in a movable container. Glass cullet would be used in the PEM™.
- *Nitrogen*. Gaseous nitrogen would be used for purging and inerting the system. The normal practice is to lease a liquid nitrogen storage tank and vaporizer from the nitrogen supplier and Sierra BioFuels expects to use a similar approach at the Facility. Nitrogen will be purchased by the truckload, offloaded to the storage tank and stored until needed.
- *Denaturant*. Ethanol must be rendered unfit for human consumption by the addition of a denaturant (e.g. gasoline). Up to 13,500 gallons of gasoline will be stored in an aboveground storage tank. Gasoline will be delivered via tanker truck trailers by a local wholesale distributor.
- *Diesel Fuel*. Diesel fuel will be used by the Facility's operation equipment, the emergency electric generator, and the emergency firewater pump. Up to 3.500 gallons of diesel fuel will be stored in 3 aboveground storage tanks at the Facility.

Ethanol produced by the Facility will be marketed as a gasoline additive to various end-users (e.g., bulk terminals, refineries, etc.). Ethanol transport off-site would be by truck. The inert material and process residue also produced will be transported via truck to an appropriate disposal site. Residual metals would be stored in removable on-site containers until a sufficient quantity is developed to warrant transportation to a recycler and a replacement container will be put in place.

Table 2-1 Industrial Materials Stored On-site

Reference No.	Inventory Item	Quantity[1]	Type of Container
Plant Area A			
Feedstock			
1	Unprocessed Feedstock	375 tons	Storage Building
2	Processed Feedstock	1,125 tons	Storage Building
Residuals			

Table 2-1 Industrial Materials Stored On-site

Reference No.	Inventory Item	Quantity[1]	Type of Container
3	Cullet Glass	37 tons	Movable Container
4	PEM Vitrified Material	150 tons	Movable Container
5	Metal Scrap	75 tons	Movable Container
Plant Area B			
Product			
6	Ethanol Storage Tanks (2)	380,000 gallons	Tank
Materials, Supplies and Industrial Waste			
7	Hydrated Lime	45 tons	Silo
8	Spent Lime	45 tons	Silo
9	Lime Slurry (40 percent sol.)	1,500 gallons	Tank
10	Calcium Hydroxide Solution (20 percent sol.)	3,000 gallons	Tank
11	Lo-Cat Solution	137,500 gallons	Tank
12	Lo-Cat Chemicals	7 drums	Drums
13	Sulfur Cake	15 tons	Movable Container
14	Carbon Guard Beds (3)	509 ft^3	Pressure Vessel
15	Ethanol Reactor (2) Catalyst	3,200 ft^3	Pressure Vessel
16	Sulfur Carbon Guard Bed	100 ft^3	Pressure Vessel
17	Auto Thermal Reactor Catalyst	100 ft^3	Pressure Vessel
18	MDEA Solution	5,000 gallons	Tank
19	Dimethyl-disulfide	8,000 pounds	Tote
20	Off-Spec Ethanol Tank	41,000 gallons	Tank
21	Ethanol Day Tanks (2)	72,000 gallons	Tank
22	Gasoline Storage Tank	13,500 gallons	Tank
23	Emergency Generator Diesel Fuel	1,000 gallons	Tank
24	Firewater Diesel Fuel	1,000 gallons	Tank
25	Cooling Tower Chemicals	3 drums	Drum
26	Sulfuric Acid (93 percent)	5,000 gallons	Tank

Table 2-1 Industrial Materials Stored On-site

Reference No.	Inventory Item	Quantity[1]	Type of Container
27	Caustic (50 percent)	110 gallons	Tank
28	Molecular Sieve (4)	6,000 ft^3	Pressure Vessel
29	Mobile Equipment Diesel Fuel	2,500 gallons	Tank
30	Lube Oil Storage	10 drums	Drum
31	Liquid Nitrogen	9,000 gallons	Tank
32	Boiler Treatment Chemicals	4 drums	Drum
33	Equipment Lube Oil	1,500 gallons	Tanks
34	Ammonia for SCR	25 tons	Pressure Vessel
35	SCR Catalyst	240 ft^3	Honey Comb Modules in HRSG
36	Filtered Particulate Matter	51 tons	Movable Container

1. Data represent maximum quantities. Actual stored quantities will likely be less.

2.1.4.11 Industrial Wastes

No disposal of waste or process residuals will take place at the Facility. The Facility will generate industrial wastes that will be continually produced by the process and those that will occur on a periodic basis, generally resulting from a change in catalysts or periodic maintenance work. The continually produced wastes would be taken off-site for disposal in an appropriate facility, including a licensed facility, if necessary. Sierra BioFuels will evaluate the markets for potential byproducts to determine if there is a beneficial use, such as sulfur for agricultural uses or vitrified PEM Waste for construction materials or roadbeds; however, such possibilities have not yet been identified. Expected industrial wastes at the Facility are discussed below, unless otherwise indicated wastes are classified as non-hazardous:

- *Sulfur (continuous)*. As described earlier Sulfur will be removed from the syngas in the syngas cleaning process (see 2.1.4.6 above). The sulfur will be in the form of a wet sulfur cake. It will be packaged in movable 15-ton containers and taken to an off-site facility for disposal.
- *Spent Lime (continuous)*. Lime is used in the dry and wet scrubbing system to remove acid gases from the syngas. The Facility could generate several tons per day of spent lime that will have to be disposed of. It is expected that concentrations of trace elements in the spent lime will not be high enough to cause this material to be classified as a hazardous waste and that it can be disposed of at an appropriately licensed disposal facility. When the Facility is in operation, the spent lime will be tested to confirm whether it is hazardous or non-hazardous. If the spent lime is classified as hazardous waste, it will be disposed of at an appropriately

licensed disposal facility. In this event, Sierra BioFuels would also review options for reducing concentrations or changing materials to render the spent lime non-hazardous.

- *Vitrified PEM Waste (continuous)*. The glassy vitrified waste from the PEM™ system will be stored on-site until a sufficient quantity is generated and then it would be disposed of at an appropriately licensed disposal facility. Testing may be required to identify any contaminants prior to beneficial use, but engineering design indicates that the vitrified material will be glassy, solid, and not include any leachable constituents.
- *Metal (continuous)*. This is a by-product from the PEM™ system. Suitable quantities would be stored on-site until recycled. Metals include the full range of elements expected in MSW.
- *Filtered Particulate Matter*. The syngas processing system filter removes particulate matter from the syngas prior to treatment by the lime wet scrubber and the Sulfur removal system. This material is dry and expected to be composed largely of inert fine particulate materials, and it may contain trace amounts of metals. The material will be either i) recycled back to the PEM™ system for vitrification; or ii) upon being tested for toxicity, and if it is a hazardous material, it will be sent for treatment and disposal at a licensed facility operated by U. S. Ecology, in Beatty, Nevada or Grand View, Idaho.
- *Water Treating Salts (continuous)*. Salts may be produced as a result of condensation from the Facility's water treatment system. These will be combined with the spent lime if possible. These salts will be disposed of at an appropriately licensed disposal facility.
- *Spent Adsorbents and Catalysts (periodic)*. Spent adsorbents and catalysts are generally replaced during periodic scheduled maintenance activities and plant shutdowns. The spent materials would be stored and tested prior to disposal. Some materials may have to be disposed of as a hazardous waste depending on the vendor material characteristics, which have not yet been identified.

2.1.4.12 Traffic

During operation of the Facility, existing roadways will provide the primary access to the Site. Adequate transportation infrastructure (e.g., access roads, railroad links) has been constructed as part of the TRI Center development. Streets within the TRI Center are designed and constructed to carry traffic associated with the I-2 Heavy Industrial zoning and will be able to handle traffic increases resulting from the Facility's daily operations. Access to the Site is via U.S. Interstate 80 (I-80) and USA Parkway. USA Parkway provides access to Peru Drive, approximately 1.5 miles off of I-80. Peru Drive provides street access directly to the Site.

In addition to road access the TRI Center is served by both Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) rail service providers. UP owns the main "east-west" line that traverses the State of Nevada along the I-80 corridor. BNSF has haul rights on the UP line. The Facility has development rights to interconnect to the TRI Center railroad spur on the northern boundary of the Site as a means to transport its ethanol to its market.

The Feedstock would be transported to the Site by tipper-style fixed floor transfer trailers or construction-style roll-off trailers. Each vehicle would carry up to 22 tons of Feedstock. The day-to-day delivery of Feedstock is expected to vary, depending on supplier opportunities and constraints,

and is expected to vary from 250 to 450 tons per day. Feedstock delivery is highly dependent on the hours of operation of the MRFs. The Facility would be open to accept Feedstock deliveries 24 hours per day, 7 days per week; however, depending on permit limitations on a particular MRF's hours of operation, deliveries may be scheduled for 5 days per week, resulting in approximately 20 to 25 loads per day. All trucks will be required to have the loads covered to prevent blowing or spillage during transport. Upon arrival at the Facility, all loads of Feedstock will be weighed prior to unloading, using a drive-on, drive-off truck scale located near the main entrance gate. Up to 4 trips per day are anticipated for delivery of the resulting ethanol product.

Assuming three work shifts, up to 21 vehicles associated with about 50 to 53 full time employees employed to work at the Facility at any given time would be anticipated. The Facility would have one to two maintenance vehicles (such as a ¾-ton pickup truck) that would be used to pick up and deliver maintenance supplies from local suppliers. There would likely be a few commercial deliveries per day (e.g., UPS, Fed-Ex, or truck common carrier). Approximately five trucks per day also would deliver supplies to the Facility (such as industrial chemicals) and would transport glass, metal, or other residuals away from the Facility. **Table 2-2** summarizes the estimated maximum total daily trips.

Table 2-2 Estimated Maximum Total Daily Trips

Traffic Source	Maximum Daily Trips
Feedstock Deliveries	25
Ethanol Deliveries	4
Staff Commuting	21
Commercial Deliveries	5
Supply Deliveries	5
Other (including waste hauling, maintenance vehicles and visitors)	23
Estimated Maximum Total Daily Trips	**83**

Although the Facility will not usually be open to the public it will likely attract visitors, due to the state-of-the-art nature of the technology to be used. Visitors may average one or two groups per week. All parking would be in the on-site parking lots. There would be a small parking lot outside the security fence for visitors and some employees, but most parking would be within the security fence.

During routine operations at the Site, all vehicles will use a one-way traffic circulation pattern when accessing the Facility and its internal access roads. Alternate traffic patterns may be used during maintenance turn-around at the direction of the Facility's management.

Tipper type trucks accessing the Feedstock Process Building tipping floor would back up to the Feedstock Processing Building via the access tipper ramp. Construction roll-off and flatbed type trailers also can directly access the tipping floor for offloading. All vehicles accessing the Facility's internal access roads to offload industrial chemicals or load industrial waste and ethanol would use a one-way traffic circulation pattern in a clockwise direction. Vehicles will exit the Facility to Peru Drive using the main plant entrance.

2.1.4.13 Labor and Operations Hours

The Facility will operate 24 hours per day, 7 days per week. The total number of employees and shift schedules are being developed as the design progresses and would be finalized when construction is completed. It is anticipated that approximately 50 to 53 full time employees (scheduled on a 24/7 basis) would be required during operations. Facility attendants are on-site during each shift, with on-site management personnel provided for all site operations associated with the Facility. The level of employment at the Site will be established by the basic business volume and will be sufficient to comply with the requirements of the relevant NDEP rules and regulations, and the provisions of the Facility's NDEP Solid Waste permit. Operations personnel will attend training classes in health and safety, environmental compliance, operations, maintenance, and equipment process safety. The following jobs would be needed for operation of the Facility:

- *Plant Manager*. The Plant Manager is responsible for managing the Facility and its staff and keeping the day-to-day operations in compliance with the solid waste regulations, NDEP solid waste permit requirements, and the Site Operating Plan (SOP)[7]. The Plant Manager is the person in charge of verifying that the SOP is maintained as required by NDEP regulations. The Plant Manager will have the authority and responsibility to reject unauthorized loads and have prohibited materials removed from the Site. The Plant Manager is responsible for communications to outside agencies as needed for emergency, fire, and other contingencies. The Plant Manager is responsible for personnel management and training of Facility staff. The Plant Manager will operate equipment, when necessary, and in his (or her) absence, would designate an alternate who would be capable of fulfilling these managerial duties.
- *Plant Operators*. The primary duties of plant operators are to operate the processing equipment necessary to presort and reject any materials that are too difficult or too large to size the Feedstock to 4 inches or smaller, convey the sized material into Feedstock storage, and convey the Feedstock from storage into the gasifiers. Facility operators will be trained in the safe operation of on-site equipment and will be responsible for maintaining a safe and orderly transfer operation. The plant operators will be supervised by the Facility operations supervisor or designated alternate. Plant operators would have a minimum of 6 months experience in plant operations or on-the-job training by the Facility operations supervisor.
- *Equipment Operators*. The primary duties of equipment operators are to operate front-end loaders and other equipment on-site; maintain a clear passageway for collection vehicles; load materials into transfer trailers; monitor scale weights on transfer trailers as they are loaded; direct loaded transfer vehicles to exit the loading areas; check for prohibited wastes; and sweep the tipping floor. The equipment operators would be trained in the safe and compliant operation of the on-site equipment and would be responsible for maintaining a safe and orderly transfer operation. The equipment operators would be supervised by the Facility operations supervisor or designated alternate. Equipment operators would have a minimum of

[7] The Site Operating Plan includes detailed procedures and actions for Facility operators to operate and maintain equipment in accord with manufacturer's specifications, Fulcrum requirements, safety, environmental, and maintenance plans.

6 months experience in equipment operations or on-the-job training by the Facility operations supervisor.

- *Gate/Scale Attendants - Security*. A gate/scale attendant will be stationed at the scale/guardhouse located at the main entrance. The attendant is primarily responsible for weighing and maintaining records of vehicles entering and leaving the Facility. The gate attendant will be trained in site safety procedures, recordkeeping requirements, to visually check for prohibited wastes, and provide general directions and information to incoming vehicles.

2.1.4.14 Facility Security

Public access will be controlled to minimize unauthorized vehicular traffic and public exposure to hazards associated with Facility operations. There are only two locations for ingress and egress to the Facility, each controlled by a gate. The Facility's main gate would be staffed and secured by plant personnel. The main employee entrance would be equipped with an employee cardkey entry system. Only vehicles authorized by the Operation's staff would be allowed to have access beyond the Facility proper. Signage and/or on-site personnel would provide directions to the unloading and loading areas.

2.1.4.15 Fire Protection

A fire protection plan will be developed as part of the SOP (Sierra BioFuels 2010b). The following steps are to be taken regularly at the Facility by designated personnel to prevent fires:

- Operators will be alert for signs of burning waste such as smoke, steam, or heat being released from incoming Feedstock loads.
- Equipment used to move waste will be routinely cleaned through the use of high pressure water or steam cleaners. The high pressure water or steam cleaning would remove combustible waste and caked material that could cause equipment overheating and increase fire potential.
- Smoking will not be permitted within the Facility. Smoking will only be permitted in designated smoking areas.

Facility personnel will take the following steps if a fire is discovered:

- Contact the Storey County Fire Department (SCFD) by calling 911. The SCFD has equipment and other assets that can respond rapidly to fires at the Site.
- Alert other Facility personnel.
- Assess extent of fire, possibilities for the fire to spread, and alternatives for extinguishing the fire.
- If it appears that the fire can be safely fought with available fire fighting devices until arrival of the SCFD, attempts to contain or extinguish the fire should be used.
- Upon arrival of the SCFD personnel, direct them to the fire and provide assistance as appropriate.

- Do not attempt to fight the fire alone and without adequate personal protective equipment.
- Establish familiarity with the use and limitations of firefighting equipment available on-site.

Methods for fighting fires would be determined based on the type of fire discovered:

- *Feedstock Fire*. Fire fighting methods for burning Feedstock include smothering the Feedstock with a backhoe bucket or separating the burning material from other Feedstock. Small fires also can be controlled with hand-held extinguishers. If a fire occurs on a vehicle or piece of equipment, the equipment operator should attempt to bring the vehicle or equipment to a safe stop. If safety of personnel allows, the vehicle will be parked away from Feedstock supplies and other vehicles. The engine will then be shut off and the brake engaged to prevent movement of the vehicle or piece of equipment. The Feedstock storage building and Feedstock processing building will be equipped with early suppression first response (ESFR) sprinkler systems installed in its ceiling to allow rapid discharge of a large quantity of water in a very efficient discharge pattern to suppress and extinguish a fire quickly, resulting in less water damage.
- *Ethanol Fire*. Ethanol and denatured ethanol fires cannot be put out with water; instead, they must be smothered with the careful application of alcohol resistant foams. The alcohol flame is almost invisible to the eye. Ethanol vapor is flammable at a wider range of concentrations. The Operator and the SCFD are to be trained to provide fire suppression, hazmat, and technical-rescue response for ethanol related fires. An adequate supply of alcohol-resistant aqueous film forming foam (AR-AFFF) will be maintained at the Facility in the Fire Response Shed. AR-AFFF has an added polymer, which forms a blanket that inhibits water absorption by the alcohol, thus not breaking down the foam as rapidly, and having a longer drain time.

The Facility will be equipped with various types of fire suppression equipment. A stand-alone Fire Response Shed will be provided for the SCFD and equipped with the supply of AR-AFFF, Piping and Instrumentation Diagrams (P&IDs), Material Safety Data Sheets (MSDS), and various emergency shut-offs.

Fire extinguishers will be maintained on all delivery and transport vehicles entering the Facility and on operation equipment in the enclosed Feedstock storage area. All fire suppression equipment will be fully charged and ready for use. Inspection and recharging will be performed following each use. The fire suppression equipment will be inspected on a regular basis. A qualified service company will perform these inspections and all extinguishers will display a current inspection tag. Records will be maintained indicating equipment inspected, date of inspection, and name of the person conducting the inspection. The intervals for inspection would be as follows:

- *Portable Fire Extinguishers*. Weekly visual inspection, annual inspection, and certification by an approved service company.
- *Hose Stations*. Weekly visual inspection, annual inspection, and certification by an approved service company.

- *Automatic Sprinkler systems*. Annual inspection and certification by an approved agency or service provider.
- Emergency Firewater Pump. Weekly testing.

Training of on-site personnel in firefighting techniques, fire prevention, response, and the fire protection aspects of the SOP will be provided by established professionals as part of initial employee training and on an annual basis. Personnel will be familiar with the use and limitations of firefighting equipment available on-site. Records of this training will be included in the operating record for the Facility.

2.1.4.16 Wastewater Management

Sanitary Wastewater

The primary source of sanitary wastewater will be the restrooms, showers, and kitchen areas of the Facility. Sanitary wastewater usually contains pathogenic microorganisms that dwell in the human intestinal tract. It also contains nutrients, which can stimulate the growth of aquatic plants and organic compounds that can produce malodorous gasses. All sanitary wastewater generated at the Facility would be discharged directly to the TRI Center sanitary sewage system.

Process Wastewater

The Facility's process wastewater is primarily composed of blowdown from the syngas scrubbing system. Under normal operating conditions the process wastewater will be piped to the Zero Liquid Discharge (ZLD) system for removal of suspended and dissolved solids. The brine produced by the ZLD system will be concentrated, crystallized and disposed off-site. When the ZLD system is off line for cleaning or repair process wastewater will be piped to the on-site evaporation pond. Process waste water will go into the retention pond and be held until it evaporates. This pond will be constructed with a double liner and a leak detection system. Process water that enters the evaporation pond will be monitored for flow and water quality.

Storm Water

Federal law prohibits the introduction of storm water into sanitary sewerage systems. Roof drains, yard drains, and other surface water drains that manage only precipitation runoff will be routed to the storm water drainage system managed by the TRI Center. The Facility's storm water drainage system has been designed in accordance with a grading and drainage plan approved by the Storey County Building Department.

Two separate submittals are required for regulation of storm water. Prior to the commencement of construction, the Operator is required to submit a Notice of Intent (NOI) to the NDEP Bureau of Water Pollution Control for coverage under the State of Nevada's Storm Water General Permit NVR100000 for storm water discharges associated with large construction activities. A Storm Water Pollution Prevention Plan (SWPPP) will be completed and maintained on-site. Prior to the commencement of operation, the Operator will also submit a NOI to the NDEP, for coverage under the State of Nevada's General Permit for Storm Water Discharges Associated with Industrial Activities (General Permit NVR050000). The Operator is required to have a SWPPP completed and maintained on-site in order to operate the Facility.

Spill Control

All employees will be trained to respond to spills or leaks from tanks, vehicles, and equipment. Steps to be taken when there is a spill detected would include:

- Stop processing, loading and/or unloading, and halt vehicle movement, as necessary;
- Secure the area;
- Identify the source;
- Notify the supervisor/manager;
- Properly clean up the affected area; and
- Document the incident.

Clean-up/spill response equipment will be placed in designated areas and clearly marked. Spill response equipment would include:

- Absorbent materials;
- Shovels, brooms; and
- Personal protection equipment (e.g., coveralls, gloves, glasses, etc.).

The Facility will have 16 aboveground storage tanks on site. For aboveground tanks and ethanol product loading, the operation's personnel will be required to:

- Conduct regular inspections to detect leaks and spills;
- Verify sound condition of containment structures;
- Label storage tanks with product name and potential health or safety hazards;
- Ensure that the secondary containment structure holds at least 110 percent of the largest tank's capacity;
- Use spill and overfill protection when fueling vehicles;
- Not allow unattended fueling;
- Install safe-guards to prevent vehicles' wash water from mixing with storm water;
- Clean up leaks and spills immediately; and
- Not allow process water and storm water to mix.

2.1.4.17 Environmental Control Design and Process Features

The Facility incorporates design and process features that will minimize environmental impacts discussed below.

Dust Control

Primary access roads are paved and on-site roadways will be paved, considerably reducing the potential for dust generation resulting from mud and dirt being tracked onto the roadway network. On-site roadways will be swept as necessary to minimize dust generation at the Facility.

Odor Control

The Facility will control odor so that there are no obnoxious odors causing a nuisance to adjacent properties. The Feedstock Processing and Feedstock Storage Buildings will be equipped with a mist odor control system on the ceiling throughout the buildings and at ingress and egress points. Plant personnel will have the capability to adjust the type of neutralizing additive used in the system based on actual conditions and constituents that may be causing odors. Mist odor control systems, which spray a water solution of odor masking or neutralizing compounds, provide one of the most effective methods for the treatment of odors associated with MSW. Depending on the type of odor being controlled, such systems can utilize either: 1) masking agents or chemical counteractants to block odor sensing, or 2) odor absorbing agents or biological compounds that alter the decomposing process and prevent odors from being generated by increasing the population of aerobic microbes and preventing anaerobic conditions.

Vector Control

Vectors such as rodents, flies, and mosquitoes will be controlled by proper daily Facility operations and housekeeping practices such as cleaning up spills, maintaining roadways, and washing of equipment. Insect and rodent bait would be used to control populations of these vectors. If necessary, a licensed professional would apply pesticides for control of vectors to ensure that proper chemicals are used and applied.

Windblown Material Control

Windblown material and litter at the Facility will be controlled through several methods, including proper unloading of Feedstock, picking up litter, perimeter fences, and landscaping. Adequate staffing will be in place to ensure that these measures are taken. Personnel will police the Facility, including perimeter fences, access roads, and the entrance gate, every operating day to pick up and return any windblown material and litter to the Facility and perform other litter control measures, as necessary.

During transport, the Operator will take steps to ensure that transfer trucks delivering Feedstock to the Facility are enclosed or provided with a tarpaulin, net, or other means to effectively secure the load in order to prevent the escape of any part of the load by blowing or spilling during transport. The Operator will also take actions such as posting signs regarding covering of loads, assessing surcharges for any uncovered loads, reporting offenders to proper law enforcement officers, or similar measures. On days when the Facility is in operation, the Operator will be responsible for cleanup of any Feedstock spilled along and within the right-of-way of public access roads serving the

Facility for a distance of 1 mile. Maintenance activities would include a once per day cleanup of spilled Feedstock materials.

Noise and Visual Screening

The Feedstock processing building and Feedstock storage building will be set back behind the Facility's administration building, which will provide partial obscuring of the view of the Facility from Peru Drive. Noise pollution is not anticipated to be an issue for surrounding landowners, as the surrounding land-use in the area is also heavy industrial. Feedstock processing operations will be performed in the enclosed Feedstock processing building which will inhibit the propagation of noise from the process operations.

Wildlife Nuisance Control

The Facility will work with NDOW on wildlife attraction nuisance issues if wildlife nuisance becomes an issue. Facility personnel will monitor the grounds for wildlife mortalities during construction and operation. Any wildlife mortalities would be reported to NDOW annually.

2.1.5 Decommissioning

A Closure Plan (Sierra BioFuels 2010c) has been prepared for the Facility pursuant to Section 4 of the NDEP, Bureau of Solid Waste Management's guidance document for the permitting of other "systems to process waste" under NAC 44.676. Should it be necessary to close the Facility, the following steps would be taken:

- When it is determined that the Facility is no longer needed or ceases operations, a written notice would be filed with the NDEP and the Storey County Planning Department 180 days prior to the date of closure.
- Within 30 days after receiving the last load of Feedstock, the Facility would be cleared of all remaining solid waste, processing residue, litter, recovered materials, and inoperable equipment in accordance with this Closure Plan, with the exception of putrescible waste, which shall be removed within 72 hours of receipt.
- The Site would be secured (i.e., padlocks on the access gates and all the doors of the buildings would be locked).
- All remaining Feedstock stored, and/or processed at the Facility would be transferred to an authorized disposal facility.
- All ethanol would be removed from the site and transferred to an authorized material dealer.
- All wastes and waste residues would be removed from the site and transferred to an authorized disposal facility and/or material dealer.
- Mobile equipment (e.g., transfer trailers, wheel loaders, forklifts, etc.) would be moved to another site, sold, scrapped, or otherwise disposed of. Building components (e.g., lights, electrical systems, doors, etc.) would be left in place for future uses and to keep the building secure.

- Operating records would be transferred to the Facility's office and maintained consistent with NDEP regulations.
- General cleanup of the Feedstock processing building, Feedstock storage building, and Feedstock handling system (i.e., disinfect and wash down the tipping floor, conveyors, cleanout of sumps and drains, etc.) would be performed.
- General cleanup of the Site and buildings would be performed.
- A closure certification would be prepared by a registered professional engineer and submitted to the NDEP for approval that the Facility has been closed in accordance with the approved Closure Plan.

Upon determination that the Facility would cease operation, a notice would be filed with the NDEP and the Storey County Planning Department that would outline the schedule for closure of the Facility. The anticipated schedule and steps to be taken to close the Facility are as follows:

- No later than 180 days prior to initiation of closure activities of the Facility, Sierra BioFuels would provide written notification to the NDEP and the Storey County Planning Department of the intent to close the Facility.
- Barriers or gates would be installed at access points following the closure date to prevent unauthorized entry into the Facility. Padlocks would be installed on the gates and the building doors would be locked or padlocked.
- Closure activities at the Facility would be completed (as described above) within 180 days following the initiation of closure activities.
- Within 10 days after completion of closure activities, a documented certification, signed by an independent registered professional engineer, would be submitted to the NDEP and the Storey County Planning Department. This certification would verify that final closure has been completed in accordance with this Closure Plan. This certification would include all applicable documentation necessary for certification of closure. Once approved, this certification would be placed in the Facility's operating record.

Since all materials would be removed from the Site, there would be no requirement for a post-closure period. As such, consistent with the NDEP rules, as part of the closure certification, the Facility would request the NDEP confirmation that a post-closure period would not be needed. This request would include a documented certification by an independent professional engineer verifying that post-closure care maintenance would not be necessary in view of the closure procedures (e.g., removal of all materials from the Site and the other closure steps as noted above) that have been implemented at that time. In any event, the Facility would retain the right of entry and maintain all rights-of-way for the closed facility for a period of at least 5 years after completion of closure unless the Facility is put to some other use or divested to a third-party.

2.1.6 Permits, Approvals, and Authorizations

A status of permitting associated with the Facility is provided in **Table 2-3**.

2.2 No Action Alternative

Under the No Action Alternative, the DOE would not provide a loan guarantee to Sierra BioFuels for construction of the Facility. In this scenario, the DOE assumes, for purposes of this EA, that the Facility would not proceed as scheduled without the Proposed Action, as the Facility's viability would remain uncertain. Although construction and operation of a waste-to-ethanol facility might be possible at the Site with alternative means of financing, that scenario is not analyzed because it would not provide for a meaningful No Action Alternative, as it would be identical to the Proposed Action and, as a result, it is assumed that the Facility would not be built or operated.

2.3 Alternative Sites or Operating Parameters Considered but Eliminated

Another parcel located within the TRI Center, northeast across Peru Drive from the current Site, was considered as an alternate site. However, the proposed Site was determined to be better suited to accommodate the Facility's equipment layout, land use requirements (e.g., minimum setbacks, required parking spaces), and the Facility's operating criteria.

Table 2-3 Permit Summary

Agency	Permit	Details	Status
Discretionary Permits and Authorizations – Prior to Construction			
Federal			
No Federal Permits Required.			
State: Nevada			
NDEP – Bureau of Air Pollution Control	Class II Air Quality Operating Permit to Construct	Typically for facilities that emit less than 100 tons per year for any one regulated pollutant and emit less than 25 tons per year total hazardous air pollutant (HAP) and emit less than 10 tons per year of any one HAP. Nevada's air quality control regulations provide for permitting construction and operation in a single permit (operating permit to construct).	Final Issued: August 23, 2010 Facility Id. No. A0921 Permit No. AP 2869-2382
NDEP – Bureau of Water Pollution Control (BWPC)	Authorization to Discharge Permit for Industrial Wastewater Retention Basin	Owner/operator must have an Authorization to Discharge Permit for the discharge of industrial wastewater to a retention basin to be built by Sierra BioFuels and located on the Site. The retention basin will constructed with a double liner and leak detection to assure that no discharge to groundwater occurs.	Final Issued: November 24, 2010 Permit No. NEV2011500
Local			
Storey County Planning Commission	Special Use Permit (SUP)	SUPs are approved upon a determination that a parcel of land is suitable in terms of location, topography, adjoining land use, physical and environmental characteristics, and size and shape for the Facility that is proposed.	Issued: March 5, 2009 SUP No. 2009-034 Extended: March 5, 2010. Additional 1-yr extension approved on February 15, 2011

Table 2-3 Permit Summary

Agency	Permit	Details	Status
Discretionary Permits and Authorizations – Prior to Operations			
State			
NDEP – Bureau of Waste Management (BWM)	Process Facility Solid Waste Operating Permit	Permit applications for the Process Facility must include: 1) design report; 2) operational plan; 3) Closure Plan; and 4) financial assurance. A Process Facility must not be constructed until the application has been approved by the NDEP-BWM.	Application for the Process Facility Solid Waste Operating Permit is complete. To be submitted upon obtaining control of new site.
Administrative Permits and Authorizations – Prior to or in Conjunction with Construction Activities			
State			
NDEP – BWPC	NPDES Storm Water Discharge Permit - Construction General Permit	Owner/operator of a construction site must have a NPDES Storm water Discharge permit to cover construction activities prior to construction.	At least two days prior to construction, submit NOI and implement SWPPP.
NDEP – BWPC	NPDES Storm Water Discharge Permit – Industrial Activity General Permit	Owner/operator must have a NPDES Storm Water Discharge permit to cover operation prior to commencement of operations.	At least 24 hours prior to Operations start-up, submit NOI and implement SWPPP.
Division of Industrial Relations, Mechanical Unit	Pressure Vessel Permit	A contractor must receive a permit prior to installing a boiler or pressure vessel	Prior to Construction

Table 2-3 Permit Summary

Agency	Permit	Details	Status
Local			
Storey County Building Department	Grading Permit	Involved with all facets of grading plan check and permit issuance of industrial grading plans to ensure sufficient local area drainage, surface mines and landscaping for the purpose of mitigating the adverse effects of erosion.	Prior to Construction.
Storey County Building Department	Building Permits	Prior to obtaining a building permit, design packages are submitted to the Storey County Building Department for reviews. Once all proposed work, existing site conditions and adjoining public facilities have met the requirements of applicable Storey County building codes, an approval would be granted and the permits issued.	Prior to Construction.
SCFD	Fire and Life Safety Plan	All businesses applying for license in Storey County shall be reviewed and inspected to current Fire and Life Safety Standards, applicable to the construction and operation of the Facility.	Prior to Construction.
SCFD	Hazardous Materials Inventory Statement	Anyone storing, handling, and/or using any amount of hazardous materials is required to submit a Hazardous Materials Inventory Statement (HMIS). The approved HMIS serves as a Fire Department Permit.	To be submitted 30 days prior to the storage of hazardous materials.
SCFD	Fire Alarm System Detection permit	Submitted with Fire and Life Safety Plan.	Prior to Construction.
SCFD	Fire Suppression System Permit	Submitted with Fire and Life Safety Plan.	Prior to Construction.
TRI Center – Architectural	ARC Design Approval	ARC reviews and approves all development proposals for conformance with the TRI Center's Declaration of	Concurrent with Building Permit

Table 2-3 Permit Summary

Agency	Permit	Details	Status
Review Committee (ARC)		Covenants, Conditions and Restrictions and Development Handbook (TRI Owners Association 2000).	application submittal.
TRIGID	Water "Will Serve" Letter	Each Facility is required to submit a written request for service to TRIGID. Upon review, TRIGID would issue a "Will Serve" letter.	Issued: June 7, 2010
TRIGID	Sewer "Will Serve" Letter	Each Facility is required to submit a written request for service to TRIGID. Upon review, TRIGID would issue a "Will Serve" letter.	Issued: June 7, 2010

3.0 Affected Environment and Environmental Effects

The Facility will be located in the TRI Center, a 107,000-acre industrial park located approximately 15 miles east of Reno, Nevada, that was established in 1999. The TRI Center, a portion of the former Asamera Ranch, is private land owned by Tahoe-Reno Industrial Center, LLC, comprising approximately 63 percent of the land area of Storey County. The TRI Center currently consists of approximately 6,000 acres zoned for industrial use, and may expand in the future, subject to Storey County approval. The entire 107,000 TRI Center is zoned "I-2 Heavy Industrial" under the Storey County zoning ordinance, which allows almost all types of industrial and commercial uses. Development at the TRI Center is guided by a development agreement between the master developers and the county, which incorporates the Development Handbook (TRI Owners Association 2000) and the Storey County Zoning Ordinance.

The Site is a 16.77-acre parcel that currently does not contain any structures, but approximately 5 acres of the parcel adjacent to Peru Drive was cleared and graded in 2008. Fill has also been added to the site to make it more usable for potential industrial clients. The site has also been disturbed through road and other infrastructure improvements prior to Sierra BioFuels' purchase of the property. The Site consists of a single parcel (Assessor Parcel Number 004-153-69) and is located at 3600 Peru Drive, McCarran, Storey County, Nevada, on the western side of Peru Drive in the southwest corner of Section 11, Township 19 North, Range 22 East. **Figure 3-1** provides a location map for the Site. The following subsections provide a description of the Site and associated resources and the potential environmental effects associated with construction and operation of the Facility. Required permits and design and process measures are identified, where necessary, that could reduce or eliminate potential adverse effects on the environment.

3.1 General Site Description

The Site is located in a high desert environment at an elevation of approximately 4,600 feet above mean sea level (amsl) south of the Truckee River Corridor. The Site is situated within the foothills of the Virginia Range on an alluvial fan near the mouth of a canyon. Regional topography slopes in a northeasterly direction with an approximate slope gradient of 5 percent and elevation difference across the Site of approximately 30 feet. Vegetation across the Site consists of sparse to moderately dense low lying shrubs and grasses.

The eastern portion of the Site (approximately 350 linear feet) has been graded, and four small fill material stockpiles are near the northeastern corner of the property. Low-lying desert vegetation covers the remaining portions of the Site. A dirt access road traverses the northeastern property boundary, from east to west. The Site is bordered on all sides by undeveloped private lands that are individual parcels for sale as industrial sites within the TRI Center. A railroad spur parallels the northern border of the Site. Easements are in place for additional railroad spurs located south and west of the Site, but these spurs have not been constructed yet. Peru Drive, the primary access point to the Site, borders the property on the east. Photographs of the Site are provided in **Figure 3-2** and **Figure 3-3**.

Figure 3-1 Facility Location

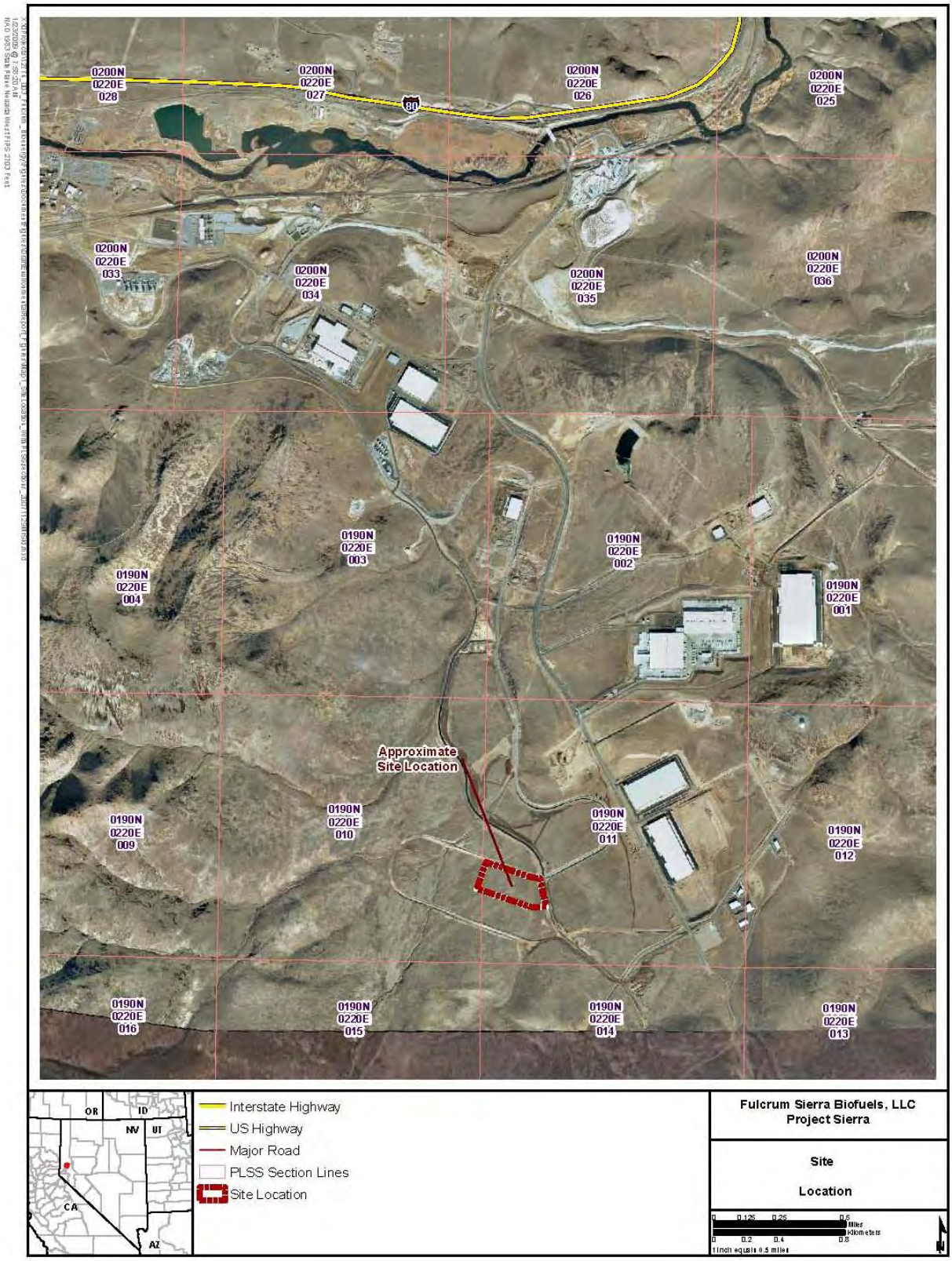


Figure 3-2 Photographs of the Site

PHOTOGRAPHIC LOG

Client Name: Fulcrum BioEnergy, Inc.	**Site Location:** 16.77-acre parcel located at 3600 Peru Drive, McCarran, Storey County, Nevada	**Project No.** 12774-003-210

Photo No. 1	**Date:** 12/2/08

Direction Photo Taken:

Facing northwest

Description:

Subject Site

Photo No. 2	**Date:** 12/2/08

Direction Photo Taken:

Facing west

Description:

Subject Site stormwater culvert

Figure 3-3 Photographs of the Site

PHOTOGRAPHIC LOG

Client Name: Fulcrum BioEnergy, Inc.	**Site Location:** 16.77-acre parcel located at 3600 Peru Drive, McCarran, Storey County, Nevada	**Project No.** 12774-003-210

Photo No. 3	**Date:** 12/2/08

Direction Photo Taken:

Facing west

Description:

Subject Site dirt access road

Photo No. 4	**Date:** 12/2/08

Direction Photo Taken:

Facing north

Description:

Subject Site graded area

3.2 Land Use and Special Management Areas

3.2.1 Affected Environment

3.2.1.1 Land Use

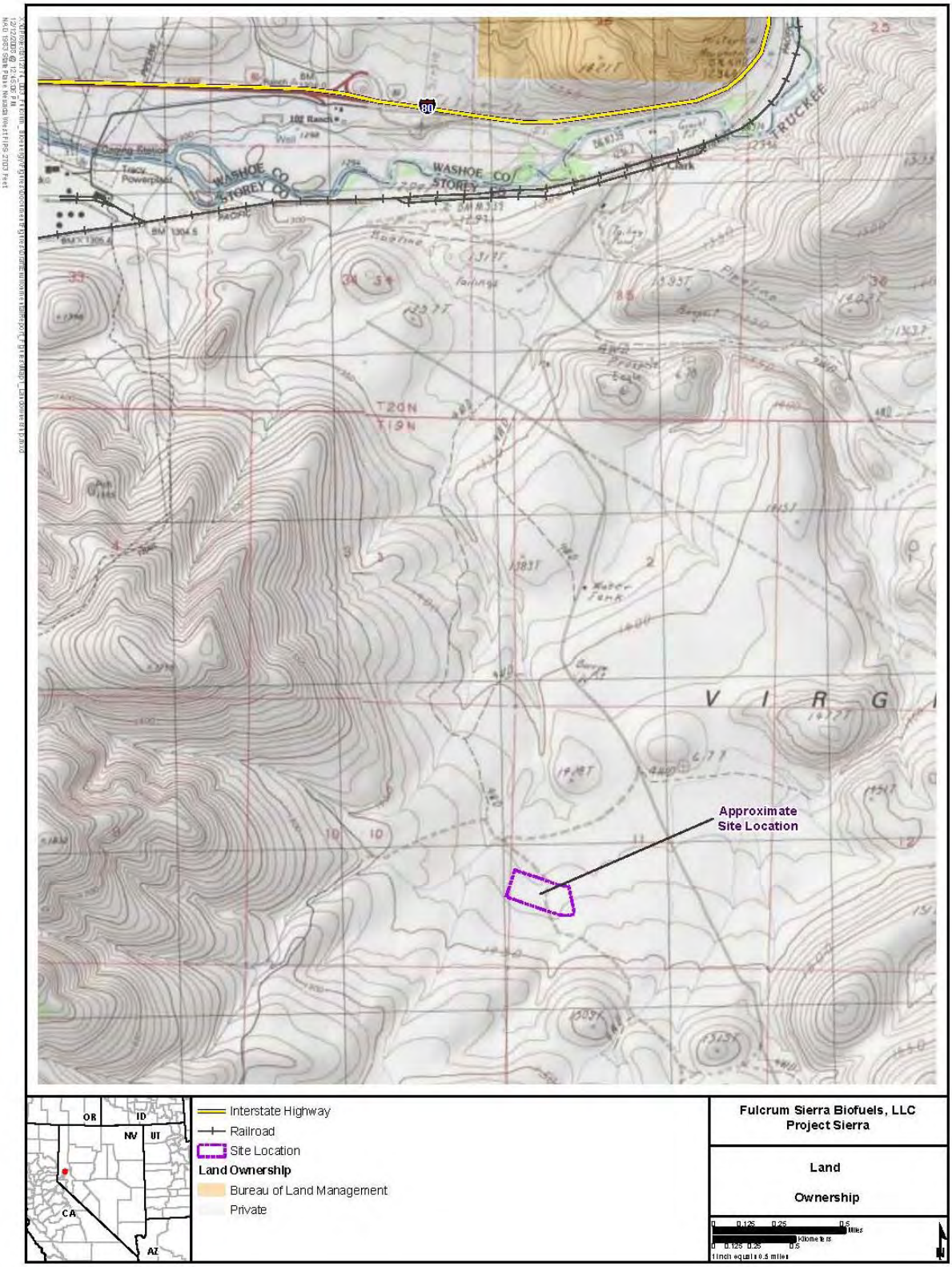
The Site and adjacent properties are privately owned by the Tahoe-Reno Industrial Center, LLC (TRI Center, LLC). Sierra BioFuels and the TRI Center, LLC, entered into a Purchase and Sale Agreement on December 23, 2008, for the purchase of the Site and closed on the property on July 2, 2009. The nearest Federal land is managed by the Bureau of Land Management (BLM), approximately 2 miles to the north and to the south. There are no state-, county-, or city-owned lands in the area. **Figure 3-4** depicts landownership in the area.

The TRI Center is a portion of the former Asamera Ranch, a 107,000-acre tract of private land owned by one of the project master developers, TRI Center, LLC. The TRI Center area comprises approximately 63 percent of the land area of Storey County, a sparsely populated rural Nevada county of 264 square miles. Storey County is the smallest county in Nevada by land area. According to the Storey County Economic Development Department (http://www.storeycounty.org/economic/demographics.asp), the county population was 4,384 in 2008. Its small population is primarily centered in the Virginia City area, 25 miles southwest of the Site, which is not connected to the TRI Center by paved roads. The TRI Center, located in the unincorporated portion of the county, is intended to be a mixed-use, nonresidential development, consisting of a wide range of industrial, office, and commercial businesses. Since the TRI Center property was purchased for development in1998, a bridge over the Truckee River, a diamond interchange on I-80, 10 miles of a four-lane freeway, and 100 miles of roads throughout the park have been built. The self-sufficient center has its own fiber-optics cable service, water, and high-pressure natural gas pipeline.

The nearest residence is in Lockwood which is approximately 6 miles from the planned location of the Facility. The TRI Center has the capacity of 100-million-square-feet of industrial space. Companies already at the TRI Center include Kal Kan Pet Foods; APL Logistics, distributors of Dell Computers; Alcoa; James Hardie; Royal Sierra Extrusions; Golden Gate Petroleum; a Wal-Mart distribution center; Trans Western Polymers; and Frank-Lin rectifiers. Three power plants also are located at the TRI Center: NV Energy, Inc. (formerly Sierra Pacific Power); Barrick Mines; and Naniwa (a power plant that provides additional power support during peak hours). Currently, the closest developed property to the Site is an auto auction facility located 0.3 mile to the west.

Development of the TRI Center is guided by a development agreement between the master developers and Storey County, which incorporates the Development Handbook (TRI Owners Association 2000) and the Storey County Zoning Ordinance (adopted July 1, 1999). The entire TRI Center property is zoned “I-2 Heavy Industrial Zone” under the Storey County Zoning Ordinance Codes §§17.37.050 to 17.37.080, which allows almost all types of industrial and commercial uses. The terms of the development agreement and the Storey County Zoning Ordinance allow maximum flexibility for land uses, but provide for a consistent, compatible development theme among the various land use possibilities in the actual Facility siting.

Figure 3-4 Landownership in the Area



3.2.1.2 Special Management Areas

There are no special management areas near the Site. The closest special management area is approximately 8 miles west-northwest of the Site, the Pah Rah Basin Petroglyphs Area of Critical Environmental Concern located on BLM lands. The closest wilderness area is approximately 20 miles west of the Site, the Mount Rose Wilderness Area, located on U.S. Forest Service lands.

3.2.2 Environmental Effects – Land Use and Special Management Areas

3.2.2.1 Proposed Action

No effects to landownership, land use, or special management areas would be anticipated as a result of the Facility. The area would remain in private ownership and the land use associated with the Facility would be consistent with the "I-2 Heavy Industrial" Zone as defined by Storey County for the TRI Center. There are no special management areas in close proximity to the Site and therefore no effects will occur to these lands.

3.2.2.2 No Action Alternative

Without the Facility, the area would remain in private ownership and the land use would continue to be consistent with the "I-2 Heavy Industrial" Zone as defined by Storey County for the TRI Center. Since the proposed Site is in an industrial park, it is likely that an industrial use will ultimately be considered for this site.

3.3 Transportation Corridors, Infrastructure, and Utilities

3.3.1 Affected Environment

3.3.1.1 Transportation and Infrastructure

Adequate transportation infrastructure (e.g., access roads, railroad links) is in place as part of the TRI Center development. The USA Parkway interchange (formerly known as the Tracey-Clark interchange) along I-80 was recently upgraded and relocated to the east in order to be the primary entry to the TRI Center. The TRI Center is served by both UP and BNSF rail service providers. UP owns the main east-west line that traverses the State of Nevada along the I-80 corridor approximately 2.5 miles from the Site. BNSF has haul rights on the UP line.

3.3.1.2 Traffic and Access

Primary access to the Site is via the USA Parkway exit on I-80, approximately 2.8 miles north of the Site. The USA Parkway interchange (formerly known as the Tracey-Clark interchange) along I-80 was recently upgraded and relocated to the east in response to the predicted increase in traffic volume over the next 20 years associated with the current and planned development of the TRI Center.

Within the TRI Center, USA Parkway leads directly to Peru Drive. The main entrance to the Site is from Peru Drive. Streets within the TRI Center are designed and constructed to carry traffic associated with the "I-2 Heavy Industrial" zoning; thus, they are sufficient to meet the traffic patterns resulting from the Facility's daily operations. All improved public streets within the TRI Center have been transferred to Storey County who maintains them (including snow removal).

3.3.1.3 Utilities

There are currently no utilities installed on the Site, according to site visits (AECOM 2008) and verified by the Storey County Building Department. However, the TRI Center, as master developer of the industrial center, has installed utility infrastructure along Peru Drive that will serve the Site; this utility infrastructure is adequate to support normal and customary service loads planned for typical industrial/commercial uses under the" I-2 Heavy Industrial" zoning classification.

3.3.1.4 Electrical Interconnection

The TRI Center will provide access to an electric interconnection to support construction of the Facility through NV Energy Inc.'s (formerly Sierra Pacific Power Company's) Patrick #225 Substation electric distribution system. When it is in operation the Facility will generate most of its expected electric power demand internally, using syngas, as discussed above. For backup electrical supply, the Facility will also be interconnected to NV Energy's 120-kV electrical primary distribution system located approximately one mile to the north. NV Energy has completed the installation of the electric distribution system for the Site, and the TRI Center has dedicated easements for the expansion of the existing 120-kV electrical transmission system to loop through the TRI Center for industrial developments that would require an interconnection at a higher voltage. To reduce interruption resulting from power outages, NV Energy provides three levels of redundancy to the TRI Center, the looped distribution system, the substation transformer, and the mainline transmission feeder.

3.3.1.5 Natural Gas Interconnection

The TRI Center has installed natural gas pipeline infrastructure to provide interconnection access to NV Energy's distribution natural gas system throughout the TRI Center. The distribution system is sourced from the Tracey City Gate, operated by Tuscarora Pipeline. The Tuscarora Pipeline mainline is located approximately 4 miles north of the site, parallel to I-80. NV Energy's natural gas distribution system interconnects with the mainline and operates between 90 and 235 pounds per square inch, gauge. NV Energy has completed the installation of the natural gas distribution system in the Peru Drive alignment adjacent to the Site. A marker for a natural gas pipeline is located across Peru Drive on the northern side of the railroad spur (AECOM 2008). On March 31, 2010, a natural gas interconnection feasibility study completed by NV Energy determined that there is adequate pressure in the existing distribution system to serve Sierra BioFuels prior to on-site compression for use as back-up fuel in the Facility's turbine generator.

3.3.1.6 Storm Drainage

Major storm drainage improvements (i.e., flood channels and basins) are constructed by the TRI Center as development occurs at the TRI Center. The Facility has designed its storm water facilities to retain and contain a 100-year flood event on-site. Storey County will maintain major storm drainage improvements while parcel owners will own and maintain on-site improvements.

3.3.1.7 Water and Sewer Service

As a private utility company, the TRIGID supplies community water and sewer service to occupants in the TRI Center. The water comes from groundwater approved by existing state permits and is pumped from wells on the TRI Center property. Additional wells, tanks, and distribution lines are constructed as development occurs. Sewage treatment is provided for TRI Center by a

treatment plant within the TRI Center, and the effluent disposal system is designed for reuse in irrigation or industrial applications. The state approves all water and sewer facility designs, and Storey County has approved the TRI Center's operating rules and regulations, including connection fees and rates. On June 7, 2010, the TRIGID issued Sierra BioFuels a Will Serve Letter for water and sewer service.

3.3.1.8 Other Utility Services

Telephone and cable TV (as well as power) are supplied from overhead lines to individual sites. Nevada Bell provides telephone service and the TCI Center supplies cable TV. A buried fiber cable warning sign was identified along the southeast boundary of the Site (AECOM 2008). This level of service will be sufficient to meet the needs of the Facility.

3.3.2 Environmental Effects – Transportation Corridors, Infrastructure, and Utilities

3.3.2.1 Proposed Action

Table 2-2 provides a summary of the estimated maximum total daily vehicle trips associated with the Proposed Action. Increases in vehicle trips will occur with up to 21 trips per day associated with up to 53 staff, up to 5 trips per day associated with commercial service deliveries, up to approximately 20 to 25 trucks per day for Feedstock deliveries, and up to 4 trips per day for ethanol deliveries. During operation of the Facility, up to 83 round trip vehicle trips per day would be added to the existing transportation system. The Facility will use existing roads, railways, infrastructure, and utilities designed to accommodate a large industrial center. Since the Facility would be located in an area that was developed with the intent of housing a large industrial center, the demand on transportation corridors, railways, infrastructure, and utilities associated with the Facility will not overload the existing upgraded systems. Therefore, impacts are anticipated to be minimal.

Similarly, the TRI Center has already put in place the natural gas, storm drainage, water and sewer service, communications, and electrical infrastructure necessary to support the Facility and no effects are anticipated as a result of Facility connections to this infrastructure.

3.3.2.2 No Action Alternative

Since the Facility would be located in an industrial park that has been developed to support a large industrial center, it is expected that if the Facility is not built that a similar use would occur at the Site and that the effects would be the same as with the Proposed Action alternative, i.e., minimal effects since transportation corridors, railways, infrastructure, and utilities have already been upgraded to handle demand from this type of use.

3.4 Water Resources

3.4.1 Affected Environment

3.4.1.1 Surface Water

The Site is located south of the Truckee River within the foothills of the east-west trending Virginia Range. The regional topography slopes in a northeasterly direction toward the river with an approximate slope gradient of 5 percent. The elevation difference across the Site is approximately 30 feet.

No naturally occurring surface water features have been observed on the Site. Two small intermittent streams meet to form one intermittent stream in the northwest corner of the neighboring parcel to the west (Parcel 2008-13), approximately 1,000 feet northwest of the Site boundary. These intermittent streams are part of a local tributary system that eventually flows north and northeast to the Truckee River, approximately 2.5 miles north. Surface water resources are shown in **Figure 3-5**.

There are no water bodies or springs on the Site according to the U.S. Geological Survey (USGS) National Hydrography Database High-Resolution geodatabase. The closest defined water bodies are a small reservoir approximately 2.8 miles northeast and a wetlands area approximately 3.1 miles northeast.

A gravel storm water culvert is located at the northeastern corner of the Site near the intersection of Peru Drive and the existing railroad spur (AECOM 2008). There has been no evidence found on-site of historical septic systems or potable/process/monitoring water supply wells (AECOM 2008).

3.4.1.2 Floodplains

The Site is not located in a flood zone or floodplain.

3.4.1.3 Wetlands

National Wetland Inventory information indicates that no federally designated wetlands are located on or near the Site. No non-jurisdictional wetlands are on or near the site.

3.4.1.4 Groundwater

According to well database records from the State of Nevada Department of Conservation, the closest water well to the Site is located within the southeast quadrant of Section 10, which is approximately a mile from the site. This water well, completed in 1999, has a recorded static groundwater level of 759 feet below the existing ground surface. A water well was drilled to 800 feet within Section 10 for Tahoe-Reno Industrial Sewer and Water and groundwater was not encountered. This water well was not completed.

Based on information from the topographical map of the Site, groundwater flows north-northeast towards the Truckee River.

3.4.2 Environmental Effects – Water Resources

3.4.2.1 Proposed Action

Surface Water

Construction

Disturbance of the property during construction would have the potential for erosion and sediment transport during storm events. Despite the significant distance to surface water, there is a slight potential for storm water run-off from the property. Since the Facility will disturb more than 1 acre, it is subject to the requirements of NDEP's *General Permit for Stormwater Discharges from Construction Activities (*General Permit No. NVR10000). Sierra BioFuels will apply for a *Construction Stormwater Discharge Permit* from NDEP through the submittal of a Notice Of Intent

(NOI). In addition, the Facility will develop a SWPPP that will detail the Best Management Practices (BMPs) that will be implemented prior to the initiation of construction. Representative BMPs include:

- Installation of physical barriers such as silt fencing, straw bales, straw waddles, and/or riprap to minimize transport of sediment and other pollutants.
- Installation of storm water drains, culverts, and other constructed conveyances to collect storm water and direct flow in process areas to the evaporation pond and divert flow away from process areas where appropriate.
- Use of secondary containment for storage of oils and chemicals.
- Inspections of the site and BMPs once a week and after every rain event greater than 0.5 inch.
- Monitoring of construction entrances for significant sediment that could be tracked out of the construction site. The on-road sediment would be regularly cleaned up and removed.

In addition, the construction site will have temporary and permanent storm water detention basins to maintain the hydraulic flow characteristics of storm water that were present before site development.

All storm water BMPs will be maintained until construction activities are complete and site vegetation has returned to 70 percent of its original natural density. A Notice of Termination of the permit would then be submitted to the NDEP.

During construction, sanitary sewage from construction workers would be collected in portable facilities and removed by a contractor to an off-site treatment facility. Minor volumes of wastewater such as hydrostatic test water may be generated during construction but would be disposed of in the on-site evaporation pond.

As a result of these measures and the distance from any streams and water bodies there will be no potential for effects to surface water at the Facility location during the construction phase.

Temporary construction water will be obtained from the TRI Center's existing water supply system. It is estimated that approximately 1.7 million gallons of water will be consumed over the 52-week construction period. Minor volumes of water (less than 50,000 gallons) will also be used for hydrostatic testing of tanks and pipes.

Operation

Both the process water (i.e., water that is required for Facility operations) and potable water that will be used by the Facility will be provided by the TRI Center through supply piping connected to the existing TRI system. Process water will be used primarily for cooling tower make-up, scrubber system make-up, and in small volumes for various plant uses such as washdown water and dust control. Local surface water will not be used either to supply plant operations or for potable use. Demand from the Facility is not expected to exceed the established water right owned by the TRI Center. There may be times when the Facility will have excess water as a result of water generated from the Feedstock. Process water will be recycled to the maximum extent possible.

The Facility will construct and operate an on-site evaporation pond; excess wastewater generated by the Facility will either be discharged to the evaporation pond or to the TRI Center's sanitary sewage system. Storm water that accumulates in process areas will be collected and piped to the storm water retention pond. Storm water that could be potentially contaminated by Facility activities will remain on-site.

The evaporation pond is subject to NDEP's Groundwater Discharge Permit program. A permit application was submitted and approved; the final permit was issued on November 24, 2010. Design of the pond follows guidance provided by NDEP, WTS-37, *Guidance Document for the Design of Wastewater Detention Basins*. Approval of design and construction specifications would be obtained from the NDEP before construction of the pond is initiated. This pond is designed with no discharge outlet and an impervious liner, and no discharges are expected.

Once operational, the Facility will be subject to NDEP's *Stormwater General Permit for Stormwater Associated with Industrial Activity*, Permit No. NVR050000. Prior to plant start-up, the Facility will apply for a storm water permit by submitting a NOI. In addition, the Facility will develop a SWPPP that details the Best Management Practices (BMPs) that will be implemented during plant operation to minimize the potential contamination of storm water. Site-specific BMPs will be developed once the site layout, engineering specifications, and operating procedures are finalized. BMPs could include treatment requirements, operating procedures, and management practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage as well as erosion and sediment controls, stormwater conveyance and diversion, or treatment structures. The Facility's storm water drainage and management system would be designed in accordance with a grading and drainage plan approved by the Storey County Building Department.

Sanitary sewage generated at the Facility would be piped to the TRI Center's sanitary sewer system. The Facility will not operate any on-site septic or sewage treatment systems.

As a result of the design features discussed above and the distance from streams or waterbodies there is no potential for effects to surface water from the Facility location during the operational phase.

Groundwater

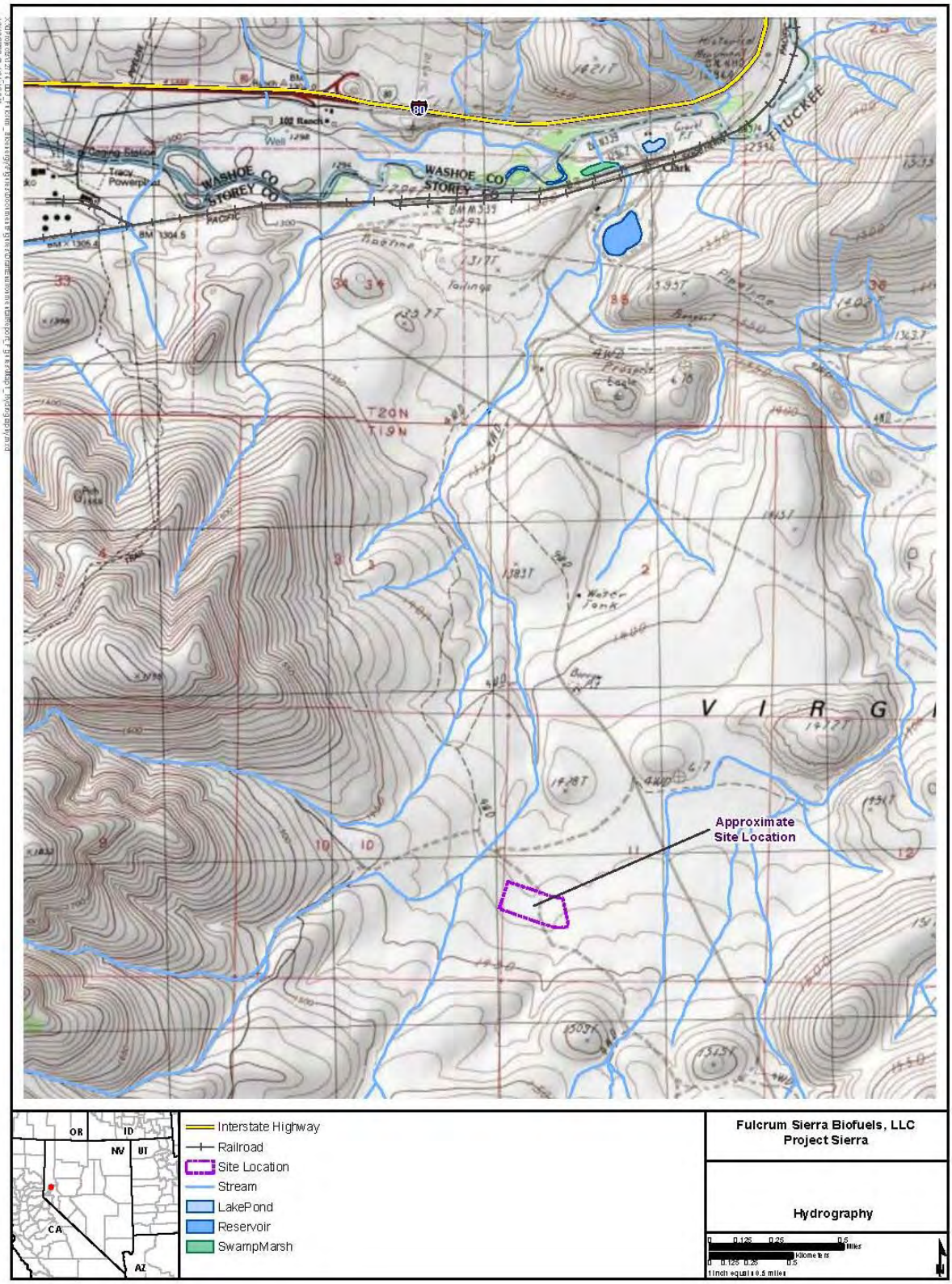
Sierra BioFuels will not be pumping groundwater as a source of water supply. The evaporation pond at the Facility will have an impervious liner designed to prevent potential transport of pollutants and contamination of groundwater. All plant chemicals and oils will be stored in tanks and containers in good condition and in areas equipped with secondary containment for added protection against spills and leaks. All plant areas are to be inspected on a daily basis for potential spills, leaks, or operating problems.

As mentioned in Section 3.4.1.4, groundwater at the Site occurs at depths greater than 700 feet below ground surface (bgs). In the unlikely event of a spill or leak, the potential to contaminate groundwater would be negligible given the depth of the water table.

3.4.2.2 No Action Alternative

Without the Facility, the Site would continue to be used as an industrial center. However, given the types of protective measures that would be required in the design of an industrial facility it is reasonable to expect that the potential impacts would be similar to the Proposed Action, i.e., little or minimal effects on water resources.

Figure 3-5 Surface Water Near the Site



3.5 Soils and Geology

3.5.1 Affected Environment

3.5.1.1 Topography

The Site is situated at an elevation of approximately 4,600 feet amsl and south of the Truckee River Corridor. Local topography of the Site is created by geomorphic features associated with an alluvial fan near the mouth of a canyon. The regional topography slopes in a northeasterly direction with an approximate slope gradient of 5 percent. The elevation difference across the Site is approximately 30 feet.

3.5.1.2 Geology

The Site is generally located within the western portion of the Basin and Range province of the Great Basin. Physiographic features of the Basin and Range are typified by north-south trending mountain ranges, which are separated by alluvial valleys. The Site is situated within the foothills along the northern terminus of the Virginia Range. Bedrock in the area consists of volcanic rock (Stantec Consulting Inc. [Stantec] 2008).

Geology at the Site is mapped as Quaternary Alluvium by the Southwest Regional Gap Analysis Project (SWReGAP[8]). Geology on-site includes Quaternary stream deposits, talus, slope wash, alluvial fan, and eolian deposits. Bedrock within the hillsides adjacent to the Site is mapped as Kate Peak Formation, which consists of various rocks associated with volcanic activity including basalt-type flows, flow breccia, tuff breccia, mudflow breccia, agglomerate, volcanic conglomerate and associated intrusive rocks ranging in composition from pyroxene andesite to rhyodacite (Bonham and Papke [1969] as interpreted by Stantec [2008]).

3.5.1.3 Soils

Stantec (2008) observed the predominant native soil unit as consisting of a coarse grained alluvial fan deposit of poorly graded gravel with silt, sand, cobbles, and boulders up to approximately 3 feet in dimension. An argillic horizon, composed of sandy fat clay with a thickness up to 1.5 feet, overlies this alluvial fan horizon.

There is no prime farmland as defined pursuant to the Farmland Protection Policy Act or hydric soils[9] on the Site.

3.5.1.4 Seismic Hazards

The Site lies near the eastern base of the Sierra Nevada Mountains, within the western extreme of the Basin and Range physiographic province. This is an area of known modern seismic activity. No mapped faults are located trending through the Site. The closest mapped fault zone is the

[8] SWReGAP is a multi-institutional cooperative effort coordinated by the U.S. Geological Survey Gap Analysis Program to provide coordinated mapping approach to create detailed, seamless GIS maps of land cover, all native terrestrial vertebrate species, land stewardship, and management status, and to analyze this information to identify those biotic elements that are underrepresented on lands managed for their long term conservation or are "gaps."

[9] Hydric soils are soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part, and are part of the criteria for identifying wetlands.

Olinghouse Fault Zone, located approximately 5 miles north of the Site. The Olinghouse Fault Zone is associated with an estimated magnitude 6.7 earthquake and associated surface rupture in 1869 (Adams and Sawyer 1999; USGS and Nevada Bureau of Mines and Geology 2006).

Seismic hazards associated with ground failure during shaking include liquefaction and landslides. Liquefaction is a loss of soil shear strength that can occur during a seismic event, as cyclic shear stresses cause excessive pore water pressure between the soil grains that can result in catastrophic settlements of large structures. Due to the presence of dense granular soils and a deep groundwater table, liquefaction potential is negligible (Stantec 2008). The Site is identified by the USGS as having moderate landslide potential because of soil types present (USGS 2005); however, there is no risk of landslides at the Site due to the low relief on the Site and distance to any steep slopes.

3.5.2 Environmental Effects – Soils and Geology

3.5.2.1 Proposed Action

There is no potential for adverse impact to geology and soils at the Site. Design specifications as detailed in the geotechnical report (Stantec 2008) for the Site regarding seismic constraints and placement of fill material will minimize the potential for damage to Facility structures.

3.5.2.2 No Action Alternative

Since the Facility is in an industrial park it is likely that should it not be constructed another, similar use of the Site will eventually take place, in which case impacts should be the same as with the Proposed Action, i.e., no or minimal impact.

3.6 Vegetation

3.6.1 Affected Environment

Vegetation in the vicinity of the Site is shown in **Figure 3-6**. The Site is classified as "Inter-mountain Basins Big Sagebrush Shrubland" by SWReGAP. According to NatureServe (2008), this ecological system occurs throughout much of the western U.S., typically in broad basins between mountain ranges, plains, and foothills between 4,600 and 7,600 feet in elevation. Soils are typically deep, well-drained, and non-saline. These shrublands are dominated by *Artemisia tridentata* ssp. *tridentata*. Scattered *Juniperus* spp., *Sarcobatus vermiculatus*, and *Atriplex* spp. may be present in some stands. *Ericameria nauseosa, Chrysothamnus viscidiflorus, Purshia tridentata*, or *Symphoricarpos oreophilus* may codominate disturbed stands (e.g., in burned stands, these may become more predominant). Perennial herbaceous components typically contribute less than 25 percent vegetative cover. Common graminoid species can include *Achnatherum hymenoides, Bouteloua gracilis, Elymus lanceolatus, Festuca idahoensis*, *Hesperostipa comata, Leymus cinereus, Pleuraphis jamesii*, *Pascopyrum smithii, Poa secunda*, or *Pseudoroegneria spicata*. Some seminatural communities are included that often originate on abandoned agricultural land or on other disturbed sites. In these locations, *Bromus tectorum* or other annual bromes and invasive weeds can be abundant (NatureServe 2008).

Cheatgrass (*Bromus tectorum*) increases the likelihood of fire in mixed sagebrush-cheatgrass sites, but burning may produce dominance of cheatgrass and other weeds. Following a fire, sagebrush must reestablish itself from seed; growth and recovery are slow (Bunting et al. 1987). Fire favors

shrubs like *Ericameria nauseosus* that can re-sprout after fire. Fire suppression in montane grasslands could lead to conversion to *Artemisia tridentata* shrublands.

3.6.2 Environmental Effects – Vegetation

3.6.2.1 Proposed Action

The Facility will remove 16.77 acres of sagebrush vegetation and understory grasses for development of the Site. For purposes of this analysis, it is assumed that all this area will be disturbed during construction. Approximately 5 acres of the site was cleared and graded in 2008 and construction of roadways and other infrastructure has occurred over limited areas nearby. The sagebrush vegetation and understory grasses are typical of the surrounding area and do not contain any unique or significant vegetation species.

3.6.2.2 No Action Alternative

A portion of the Site is already disturbed as a result of filling and grading. Roadways and infrastructure have already been constructed adjacent to the Site or nearby. Since the Site is zoned for industrial development, removal of sagebrush vegetation and understory grasses on the remainder of the 16.77 acres will likely occur in the future under the No Action alternative. Therefore, it is expected that impacts will be similar to those described under the Proposed Action.

3.7 Wildlife and Fisheries

3.7.1 Affected Environment

The following descriptions of both resident and migratory wildlife include species that have either been documented near the Site or those that may occur in western Nevada based on habitat associations. Wildlife species occurring near the Site are typical of the intermountain semi-desert shrublands of the Truckee River valley. Information regarding wildlife species and habitat near the Site was obtained from a review of existing published sources, U.S. Fish and Wildlife Service (USFWS), Nevada Department of Wildlife (NDOW) file information, and Nevada Natural Heritage Program database information.

3.7.1.1 Big Game

The Site does not contain any important big game habitats such as migration corridors, critical winter habitat, or calving/fawning/lambing habitats (NDOW 2008a, c). Big game use of the Site is low and based on scat present, consists mainly of mule deer occasionally wandering through the Site. Big game population numbers in the western Nevada fluctuate slightly from year-to-year based on weather and habitat conditions. Water availability and amount of quality habitat are the limiting factors to big game populations within the project area. Human presence, water availability, forage quality, cover, and weather patterns typically determine the level of use and movement of big game species.

The Site has been mapped as containing Mule Deer Limited Range (**Figure 3-7**) and Potential Bighorn Sheep Range (**Figure 3-8**). Potential bighorn sheep range is present west of the Site (NDOW 2008a,c), but due to the industrial development in the vicinity, bighorn sheep are not likely to use the Site.

Figure 3-6 Vegetation at the Site

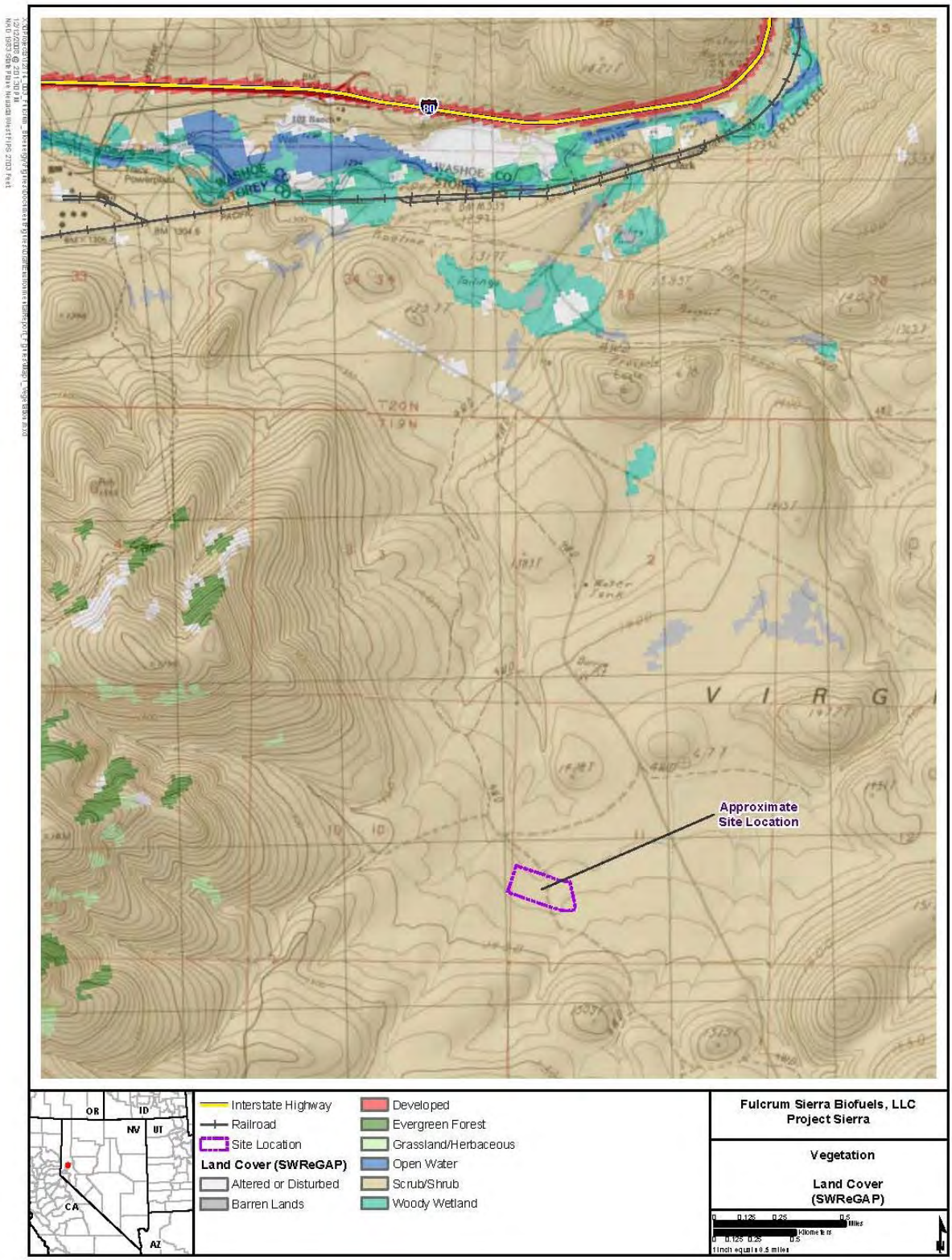


Figure 3-7 Mule Deer Habitat at the Site

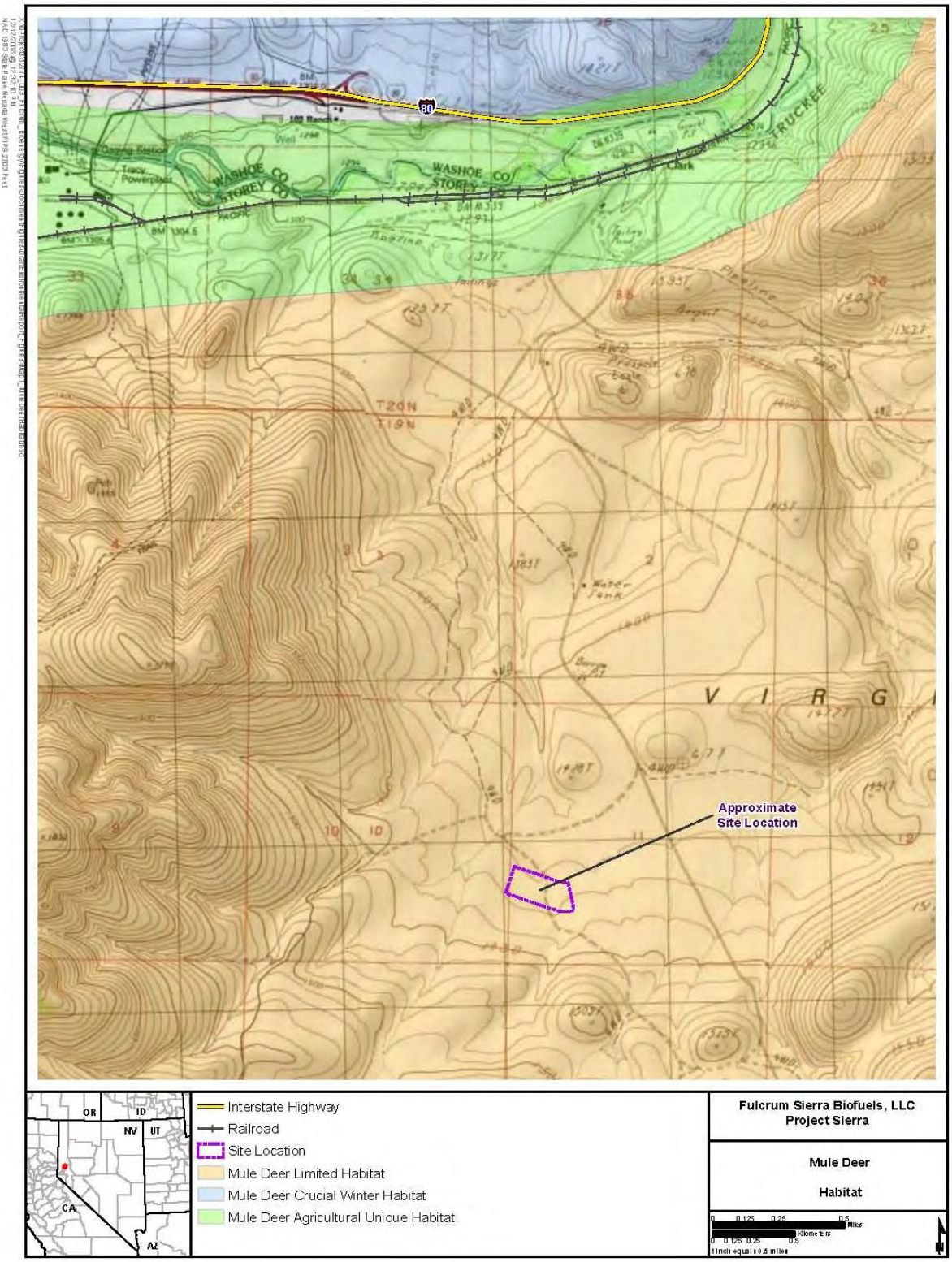
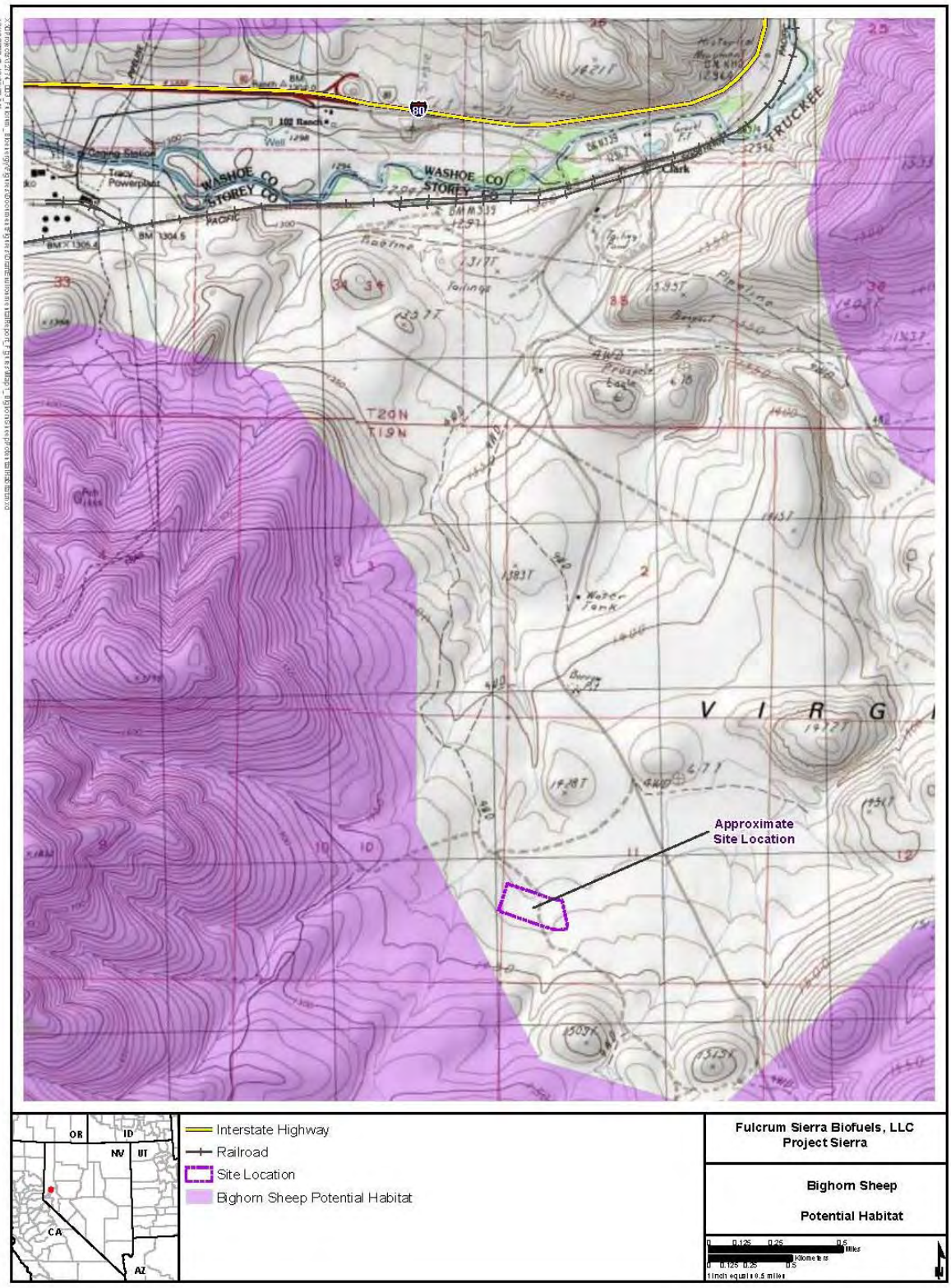


Figure 3-8 Bighorn Sheep Habitat at the Site



Mountain lions and black bears also are classified as a big game species in Nevada (NDOW 2008a, b). Both of these species are fairly common in western Nevada and typically occupy the higher elevations surrounding the Site; although they may travel through the Site if prey populations are present (NDOW 2008a, b).

3.7.1.2 Small Game

Small game species that could potentially occur near the Site include chukar, mourning dove, cottontail, and black-tailed jackrabbit (NDOW 2008b). Chukar are mainly found west of the Site, especially on rocky ridges and hillsides with cheatgrass (NDOW 2008b). Mourning doves are found in wide range of habitats in close proximity to water and are most likely to occur near the Site during spring, summer, and early fall. Furbearers that may occur near the Site include badger, red fox, and bobcat (NDOW 2008b).

Due to lack of habitat, waterfowl or shorebird concentrations are limited to ponds, springs, and wetlands located along the Truckee River approximately 4.5 miles north of the Site and are not typically found near the Site.

3.7.1.3 Nongame Species

A diversity of nongame species (e.g., small mammals, passerines, raptors, and reptiles) occupy a wide range of trophic levels and habitat types within the region. Habitat found on the Site (e.g., sagebrush shrubland) supports a variety of resident and seasonal nongame species. Nongame mammals include such species as deer mouse, western harvest mouse, desert woodrat, and Ord's kangaroo rat (Hall 1995). They provide a substantial prey base for the predators including mammals (e.g., coyote, badger, skunk), raptors (eagles, hawks, falcons, owls, vultures), and reptile species found near the Site. Representative birds that occur within the region are discussed in Section 3.7.1.4.

Several bat species may occur near the Site, including pallid bat, big brown bat, western pipistrelle, Yuma myotis, California myotis, western small-footed myotis, long-legged myotis, Brazilian free-tailed bat, and Townsend's big-eared bat (Bradley et al. 2006). The pallid bat and Brazilian free-tailed bat are Nevada protected species and the Townsend's big-eared bat is a Nevada sensitive species (NDOW 2008d). These species are discussed in more detail in Special Status Species (Section 3.8).

Other important nongame species that are found near the Site include several species of reptiles and amphibians. These species include the Great Basin whiptail, Great Basin rattlesnake, and Great Basin spadefoot (NDOW 2008b).

3.7.1.4 Migratory Birds including Raptors

See Section 3.8 Special Status Species regarding a discussion on migratory birds and Birds of Conservation Concern (BCC) protected under the MBTA.

3.7.1.5 Fisheries

No fisheries resources are found near the Site due to a lack of perennial water sources. Facility related activities will not affect fisheries in the Truckee River, due to the river's distance of approximately 4.5 miles north of the Site.

3.7.2 Environmental Effects – Wildlife and Fisheries

3.7.2.1 Proposed Action

Potential effects include surface disturbance or alteration of habitats, increased habitat fragmentation, animal displacement, changes in species composition, increased mortality due to poaching and harassment, and the increased likelihood of animal/vehicle collisions from increased traffic in the area. The severity of these effects on terrestrial wildlife depends on factors such as the sensitivity of the species, seasonal use patterns, type and timing of activity, and physical parameters (e.g., topography, cover, forage, and climate).

Direct effects will be the surface disturbance of approximately 16.77 acres of potential wildlife habitat. However, since the Site is zoned for industrial development, this impact will probably occur regardless of the development of the Facility.

Big Game Species

The Facility will result in long-term disturbance (greater than 20 years) and removal of mule deer habitat, and further fragment the limited habitat in the area for big game. The Facility also will result in increased noise levels, human presence, proliferation of weeds, and dispersion of dust during construction, which also would affect big game that may be in the area. Big game animals would likely decrease their use within 0.5 mile of surface disturbance activities (Ward et al. 1980). Big game will be displaced to adjacent habitats in the short term and to areas outside the TRI Center in the long term as more development occurs in the TRI Center. However, due to the current low likelihood of big game using the Site and availability of habitat outside the Site, impacts to big game are expected to be minimal.

Small Game Species

The Facility will result in the incremental disturbance and removal of habitat for small game (upland game birds, small mammals) and increased habitat fragmentation. Direct effects to small game species could include nest or burrow abandonment or loss of eggs or young. It is not likely that the expected losses would have a measurable effect on species populations due to the availability of suitable habitat outside the Site. Development will also discourage small game species at the Site as a result of increased noise levels and human presence, dispersal of noxious and invasive weed species, and dust effects from construction.

Nongame Species

Direct impacts to nongame species will include disturbance and removal of habitat and increased habitat fragmentation. Impacts also could result in mortalities of less mobile species (e.g., small mammals, reptiles, amphibians, and invertebrates), nest abandonment, and loss of eggs or young as a result of crushing from vehicles and heavy equipment. Nongame species will also be less likely to use the Site area as a result of increased noise levels and human presence, dispersal of noxious and

invasive weed species, and dust effects from construction. Impacts to nongame species populations are expected to be minimal due to availability of habitat outside the Site. Given that the Site is zoned for industrial development, this impact will likely occur regardless of the Facility.

Migratory Birds including Raptors

See Section 3.8 Special Status Species for a discussion of environmental consequences to migratory birds and BCC species protected under the MBTA.

Fisheries

There will be no effects to fisheries resources from the Facility, due to a lack of perennial water sources near the Site. Facility-related activities will not affect fisheries habitat in the Truckee River.

3.7.2.2 No Action Alternative

A portion of the Site is already disturbed as a result of filling and grading. Roadways and other infrastructure have already been constructed adjacent to the Site or nearby. Since the Site is zoned for industrial development, removal of potential wildlife habitat on the remainder of the 16.77 acre parcel will likely occur in the future under the No Action Alternative. Therefore, it is expected that impacts will be similar to those described under the Proposed Action.

3.8 Special Status Species

Special status species include species listed by the USFWS as threatened, endangered, proposed and/or candidate species under the Endangered Species Act of 1973 (ESA), species identified by USFWS as Birds of Conservation Concern (BCC) and wildlife species identified by State of Nevada as endangered, threatened, and sensitive (NAC 501.100-503.104). The USFWS' BCC includes birds that are protected under the Migratory Bird Treaty Act of 1918. Information regarding special status species near the Site was obtained from a review of existing published sources, USFWS, NDOW file information, and Nevada Natural Heritage Program database information.

3.8.1 Affected Environment

3.8.1.1 Federally Listed Species

There are no Federally listed plant or wildlife species known to occur at the Site. According to the Nevada Natural Heritage Database (2004), the nearest occurrence of a Federal threatened/endangered species is approximately 4 miles to the west-northwest of the Site for the Northwestern pond turtle, a species that is not likely to occur at the Site due to lack of habitat (i.e., water sources).

3.8.1.2 State Listed, Protected, Sensitive, and Migratory Bird Treaty Act Species[10]

Based on evaluation of habitat requirements and/or known distribution a total of six state listed special status wildlife species were identified as having the potential to occur near the Site (NDOW 2008d; USFWS 2008). These species are listed as either Nevada State Protected (NV-SP) or Nevada State Protected Sensitive (NV-SPS). These species include three mammals: the pallid bat, Brazilian free-tailed bat, and Townsend's big-eared bat; and three bird species: loggerhead shrike, sage thrasher, and Brewer's sparrow. Details on each species are described in the following subsections. There are no occurrences of state listed or sensitive plant species at the Site.

Seven species have been identified as Birds of Conservation Concern[11] by the USFWS. Two of these are also state listed bird species, the loggerhead shrike and Brewer's sparrow Five other BCC species may also occur at the Site: Ferruginous hawk, Burrowing owl, gray vireo, Virginia's warbler, and the sage sparrow.

Special Status Mammals

The pallid bat (NV-SP) is a year-round resident in Nevada. Found primarily at low and mid elevations (1,300 to 8,400 feet), this species occupies a variety of habitats such as piñon-juniper, blackbrush, cresote, sagebrush, and salt desert scrub (Bradley et al. 2006). This species feeds primarily on large ground-dwelling arthropods (e.g., scorpions, centipedes, grasshoppers), but also feeds on large moths (Bradley et al. 2006). The pallid bat is a colonial species, roosting in groups of up to 100 individuals (Arizona Game and Fish Department [AGFD] 1993). Roost sites consist of rock outcrops, mines, caves, hollow trees, buildings, and bridges (AGFD 1993; Bradley et al. 2006). The pallid bat is intolerant of roost sites in excess of 40 degrees Celsius (Bradley et al. 2006). This species has been documented in the region (Bradley et al. 2006). Based on its known range and suitable foraging habitat near the Site, the potential for this species to occur near the Site is considered high.

The Townsend's big-eared bat (NV-SPS) is a year-round resident found throughout Nevada from low desert to high mountain habitats (690 to 11,400 feet in elevation) (Bradley et al. 2006). The Townsend's big-eared bat primarily occurs in piñon-juniper, mountain mahogany, white fir, blackbrush, sagebrush, salt desert scrub, agricultural lands, and urban habitats (Bradley et al. 2006). This species prefers caves, mines, and buildings that maintain stable temperatures and airflow for nursery colonies, bachelor roosts, and hibernacula (Harvey et al. 1999). It does not make major migrations and appears to be relatively sedentary, not traveling far from summer foraging grounds to winter hibernation sites (Harvey et al. 1999). Its distribution seems to be determined by suitable roost and hibernation sites, primarily caves and mines. This bat is believed to feed entirely on moths (Harvey et al. 1999) and gleans insects from foliage and other surfaces (Bradley et al. 2006). This

[10] All native migratory birds of the United States are protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703-712 et. seq.). Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, directs Federal agencies to take certain actions to further implement the Act. In 2006, DOE and USFWS signed a Memorandum of Understanding (MOU) regarding the implementation of Executive Order 13186. This MOU requires DOE to integrate migratory bird conservation principles, measures, and practices into DOE activities. The MOU also commits DOE to avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources.

[11] For MBTA, the USFWS typically places the highest priority on Birds of Conservation Concern (BCC) (USFWS 2002).

species has been documented in the region (Bradley et al. 2006). Based on its known range and suitable foraging habitat near the Site, the potential for this species to occur near the Site is considered high.

The Brazilian free-tailed bat (NV-SP) is found throughout Nevada in a wide variety of habitats ranging from desert scrub to high elevation mountain habitats (680 to 8,200 feet in elevation) (Bradley et al. 2006). This species roosts in a variety of structures including cliff faces, caves, mines, buildings, bridges, and hollow trees. Some caves are used as long-term transient stopover roosts during migration (Bradley et al. 2006). The Brazilian free-tailed bat is known to travel long distances to foraging areas and often forages at high altitudes. This species has been documented in the region (Bradley et al. 2006). Based on its known range and suitable foraging habitat near the Site, the potential for this species to occur near the Site is considered high.

Special Status Birds

Birds listed as BCC in the Great Basin Region that are potential breeders near the Site include ferruginous hawk, burrowing owl, loggerhead shrike, gray vireo, Virginia's warbler, Brewer's sparrow, and sage sparrow.

Although suitable nesting and foraging habitat is present within and near the Site, the likelihood of nesting ferruginous hawks is very low due to industrial development in the vicinity. Ferruginous hawks are sensitive to disturbance and therefore typically nest away from developed areas (Schmutz 1984; White and Thurow 1985). Burrowing owls may nest near the Site, especially in areas with abandoned small mammal burrows.

Loggerhead shrike, gray vireo, Virginia's warbler, Brewer's sparrow, sage thrasher, and sage sparrow are neotropical migrants that may occur near the Site from spring through early fall. Their breeding season is approximately April 15 through August 1.

The loggerhead shrike (NV-SPS) is a common resident throughout Nevada. This species is found in open grasslands along valley floors and foothills of the Great Basin. In Nevada, it is commonly found in scrub habitat types such as sagebrush and greasewood. Loggerhead shrikes prefer shrubs or small trees for nesting, but nesting also can occur in piñon-juniper woodlands. This species can be found perching on wire, fences, or poles (National Geographic Society [NGS] 1983). There is suitable nesting and foraging habitat near the Site. The potential for this species to occur near the Site is considered high.

The sage thrasher (NV-SPS), Brewer's sparrow (NV-SPS), gray vireo (BCC), Virginia's warbler (BCC), and sage sparrow (BCC) are found throughout southern and western Nevada in low elevation habitats such as desert scrub and sagebrush grasslands. These species occur less frequently in mountain shrub habitats. These species nests near the ground under sagebrush and other shrubs (NGS 1983). Suitable nesting and foraging habitat exists near the Site. The potential for these species to occur near the Site is considered high.

3.8.2 Environmental Effects – Sensitive Species

3.8.2.1 Proposed Action

Federally Listed Species

Since there are no Federally listed plant or wildlife species at the Site, no impacts to Federally listed species are anticipated.

State Listed, Protected, Sensitive, and Migratory Bird Treaty Act Species

Impacts to special status wildlife species from surface disturbance would parallel those described in Section 3.7.2.1, resulting from the long-term removal of approximately 16.77 acres of potential habitat. These impacts would last until the Facility is decommissioned (estimated at 30 years), successful reclamation is completed, and vegetation is reestablished. Given that the Site is zoned for industrial development, this impact will probably occur regardless of the Facility. Further, if the Facility is decommissioned it is likely that another industrial plant would occupy the site.

Special Status Plants

Since there are no state listed or sensitive plant species at the Site, no impacts to special status plant species would be anticipated.

Special Status Mammals

Potentially suitable foraging habitat for the three species (pallid bat, Townsend's big-eared bat, and Brazilian free-tailed bat) exists near the Site. Construction and operation of the Facility could result in indirect effects to local bat species and their habitat. Indirect effects would include the long-term disturbance of foraging habitat, including approximately 16.77 acres of habitat. However, due to a lack of roosting habitat near the Site, impacts to sensitive bat species are expected to be minimal. Given that the area is zoned for industrial development, this impact would probably occur regardless of the Facility.

Special Status Birds

As discussed at 3.8.1.2 above seven species listed as Birds of Conservation Concern (BCC) are potential breeders near the site: ferruginous hawk, burrowing owl, loggerhead shrike, gray vireo, Virginia's warbler, Brewer's sparrow, and sage sparrow; one species, the sage thrasher, is a state listed special wildlife species but not a BCC.

Since construction and operation of the Facility will result in the long-term removal of approximately 16.77 acres of potentially suitable breeding habitat, impacts to breeding pairs of these species may occur. Noise and human presence could also deter use of the area by these species. During the breeding season (March 15 through July 31), development activities could also result in the abandonment of a nest site or territory or the loss of eggs or young, resulting in the loss of productivity for the breeding season. Development also would fragment habitat as a result of increased noise levels and human presence, dispersal of noxious and invasive weed species, and dust effects from construction. However, the degree of these potential effects would depend on a number of variables including the location of the nest site, the species' relative sensitivity, breeding phenology, and possible topographic shielding. As mentioned above at 3.6.1 the Site is classified as Inter-mountain Basins Big Sagebrush Shrubland. This ecological system occurs throughout the

Western U.S. and there is nothing special or unique about the Site habitat, particularly in view of its already disturbed nature. Habitat for these species also exists near the Site.

Potential impacts to breeding birds from development activities will be minimized during construction by avoiding removal of migratory bird habitat on currently undisturbed lands on the Site to the extent possible between March 15 and July 31. Should removal of habitat be required during this period, Sierra BioFuels will coordinate with the NDOW and the USFWS to determine if surveys and appropriate mitigation, such as buffer zones around occupied nests, may be needed. As a result of these measures and due to the large amount of suitable habitat in the vicinity of the Site and beyond the TRI Center, impacts to species populations are expected to be minimal. Finally given that the area is zoned for industrial development, this impact will probably occur regardless of the Facility.

3.8.2.2 No Action Alternative

A portion of the Site is already disturbed as a result of filling and grading. Roadways and other infrastructure have already been constructed adjacent to the Site or nearby. Since the Site is zoned for industrial development, removal of potential habitat on the remainder of the 16.77 acre parcel will likely occur in the future under the No Action alternative. Therefore, it is expected that impacts will be similar to those described under the Proposed Action.

3.9 Air Quality

3.9.1 Affected Environment

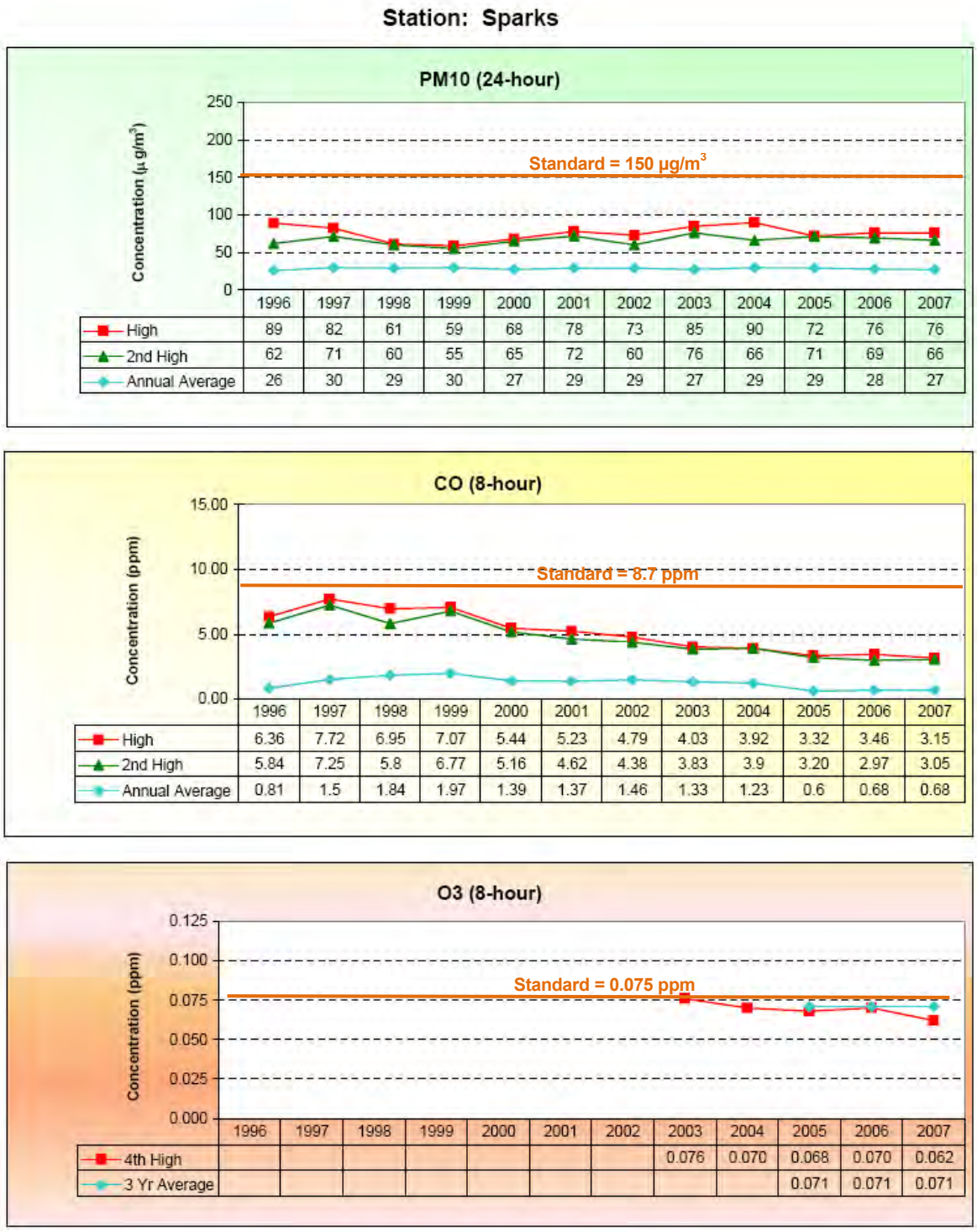
The Site is located near Washoe County, approximately 8 miles east of Sparks, Nevada. No air quality data are collected at the TRI Center. However, a monitoring site in Sparks, Nevada, operated by the Washoe Department of Health, provides ongoing measurements of particulate matter less than 10 microns in diameter (PM_{10}), CO, and ozone. Due to the proximity of the monitoring site to Reno-Sparks, the monitoring results from this station would be higher than the values registered at the more remote TRI Center area. However, the Sparks monitoring results provide an indication of air quality data at the Site.

Air quality monitoring data collected in Sparks, Nevada, through 2007 are provided in **Figure 3-9**, which shows the tabular readings of the highest and average levels since 1996 for PM_{10} and CO, and since 2003 for ozone. The PM_{10} levels for the highest 24-hour period are well below the applicable ambient air quality standard (150 micrograms per cubic meter [$\mu g/m^3$]). Although the annual standard (originally at 50 $\mu g/m^3$) has been rescinded, the data show continued annual average values are well below that level. The monitored levels of CO are continuing a gradual decline since 1997. The second-highest monitored values are generally about 3 parts per million (ppm) compared to the 8-hour standard of 9 ppm. Ozone has been monitored at the Sparks, Nevada, monitoring site since 2003. Data in **Figure 3-9** also show a slight decline in the fourth highest annual 8-hour value. The ozone standard is set at the fourth highest 8-hour daily ozone readings averaged over 3 consecutive years. The ozone standard is 0.08 ppm, and the 3-year average fourth-highest value at Sparks most recently measured 0.071 ppm. The new ozone standard is set at 0.075 ppm, and would be implemented over the next 3 years; however, the Sparks data also show compliance with that standard.

For other criteria pollutants (nitrogen dioxide [NO_2], sulfur dioxide [SO_2], lead, and particulate matter less than 2.5 microns in diameter) the air quality is designated as "unclassifiable" or "attaining the national standards." Data from other sites in the region, including some older data from Carson City (not shown here) also indicate that the ambient air quality meets the required state and federal standards.

The United States Environmental Protection Agency (EPA), promulgated the federal general conformity rule (40 CFR 51 and 93) to implement Section 176(c) of the CAA, which contains requirements that apply specifically to federal agency actions, including actions receiving federal funding, to ensure they are consistent with the CAA and applicable State implementation plans (SIPs). The purpose of a SIP is an attainment or maintenance demonstration to eliminate or reduce the severity and number of violations of national ambient air quality standards (NAAQS) and to achieve expeditious attainment of such standards. In general, the rule ensures that all criteria air pollutant emissions and volatile organic compounds (VOCs) are specifically identified and accounted for and conform with the SIP. The provisions of the general conformity rule do not apply in attainment areas, and because the proposed project in an attainment area (see 3.9.1 above), these provisions will not apply to the proposed project.

Figure 3-9 Air Quality Measured Values at Sparks, Nevada



3.9.2 Environmental Effects – Air Quality

3.9.2.1 Proposed Action

Construction

Stationary Sources

A *Class II Air Quality Operating Permit to Construct* (the "Air Permit") was issued to the original developer, IMS Nevada, LLC, under the NDEP rules for a minor source permit. The NDEP transferred the Air Permit to Sierra BioFuels on April 21, 2008. On September 23, 2009, a Revised Air Permit (No. AP2869-2382) was issued by the NDEP to reflect the changes in equipment design, operating efficiencies, and process improvements that Sierra BioFuels has made to the Facility. A subsequent application to modify the air permit addressing the emissions associated with self generation was submitted in February 2010 and deemed complete in March 2010. A revised permit was issued on August 23, 2010.

Construction Related Mobile Sources

A wide range of engine sizes and equipment types comprise the typical non-road mobile sources used during the construction of an industrial facility. The emissions generated by pieces of construction equipment are temporary and result in generally localized impacts on air quality.

EPA has developed a model for estimating emissions and/or emission factors from non-road equipment; NONROAD2008 is the latest version of this model. The model estimates volatile organic compounds (VOC), carbon monoxide (CO), oxides of nitrogen (NO_x), PM (including PM_{10} and $PM_{2.5}$), SO_2, and carbon dioxide (CO_2). The construction emissions associated with the Facility were estimated using the highest emission factor for each pollutant for engines from 25 to 500 horsepower (hp), using data for Tier II engines from the EPA's 2008 Non-road emissions database (EPA 2010)[12].

The construction of the Facility is anticipated to take place over a period of 13 months, and include a series of activities from site preparation with major earth moving equipment, through excavation, installation of concrete foundations, installation of utilities, hauling and lifting major unit equipment pieces, through cleaning, painting, and site regarding and landscaping. A variety of non-road construction equipment will be used at various points of the construction, including air compressors, dozers, cranes, trucks, forklifts, pumps, and packers. A complete listing of the types of equipment and their associated emission factors, hours of operation, and total emissions can be found in Appendix C to this document.

Table 3-1 summarizes the estimated emissions associated with construction of the Facility. The total emissions associated with the Facility's 13 month construction schedule are very small and temporary in nature.

[12] EPA 2010. *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling-Compression-Ignition* Report No. NR-009d. July 2010. Assessment and Standards Division EPA, Office of Transportation and Air Quality

Table 3-1 Sierra BioFuels Construction Emissions (13-month Construction Schedule)

	NO_x	SO_2	VOC	PM	CO	CO_2
Total (tons):	87	12	13	7	51	4,080

Fugitive dust emissions would also be generated by construction by moving construction vehicles and by earth moving, handling, and stockpiling activities. These emissions are short term, intermittent emissions that result in generally localized impacts to air quality. The Facility will employ the following best management practices to minimize fugitive dust generation during construction:

- Water spraying during excavations and earthwork loading operations;
- Intermittent spraying of material piles;
- Haul roads are maintained and watered;
- Trucks transporting construction materials are covered;
- Job site speeds will be maintained at 5 mph or less; and
- Excavated materials will be maintained away from active traffic lanes.

Operations

The operation of the Facility will require an operating permit to construct under the NDEP air quality regulations. Given the anticipated rate of the emissions, the Facility will operate under a Class II Operating Permit, as a minor source.

The Facility will operate a number of units that emit pollutants to the atmosphere. Emission points consist of both point sources and fugitive (non-point) sources. Specific emission points include the following:

- Three syngas gasification units that generate the syngas;
- Six separate natural gas-fired pre-heater burners that emit through a common stack, and fueled by only natural gas when operating used to heat the process units prior to startup or to maintain the temperature of the process units during brief down-times;
- A combustion turbine that is fired on syngas to generate electricity;
- A sulfur removal unit, with a separate vent, that removes sulfur from the syngas stream;
- An ethanol reactor and production plant, including a unit that captures and removes (or vents) CO_2, a distillation column that processes syngas into an ethanol product, a catalytic reactor purge stream, and other processes that clean the syngas and ethanol prior to shipment;
- Various storage tanks;
- Ethanol product loading areas;

- A "package" boiler that provides steam heat to the process units;
- Storage silos for chemicals used to treat the product and intermediates;
- A dust collector system on the fuel supply unloading areas; and
- Emergency diesel engines that are used for power generation or fire water pumps.

Table 3-2 lists the total emissions of the criteria air pollutants as well as the major hazardous air pollutants that would be emitted by the operations of the Facility's emissions units as permitted under the Air Permit No. AP2869-2382. The table shows that all emissions of all individual criteria pollutants would be less than 100 tons per year. According to NDEP classifications for operating permits, the anticipated emission rates from the Facility are a Class II (minor source) for air emissions. NDEP evaluated the emissions from the Facility and conducted a technical review to demonstrate compliance with ambient air quality standards.

The air permit application included an environmental report that evaluated air quality related impacts from the Facility. That report documents the emission rates associated with all of the sources at the Facility, along with the source release characteristics, and provides both the short-term (24-hour and less) and long-term (annual average) projected concentrations at the maximum receptor around the Facility. The model results show that all impacts are below the established ambient air quality standards. The air permit application included emissions modeling that addressed air quality related impacts from operating the Facility.

Table 3-3 provides a summary of modeled impacts of the emissions. It lists the individual pollutants that were evaluated, along with the maximum impact at any of the modeled receptors for each pollutant and for each time period. All short-term impacts reflect the maximum concentration for the applicable time period. The results of this modeling analysis demonstrate that the Facility would not cause or contribute to an exceedence of an ambient air quality standard.

Table 3-2 Facility-wide (Stationary Source) Potential to Emit Pounds Per Hour and Tons Per Year

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)
Total Particulate Matter (PM)	17.73	28.50
Particulates as PM_{10}	17.73	28.50
Sulfur Dioxide	83.79	10.97
Carbon Monoxide	115.35	30.26
Oxides of Nitrogen	64.33	65.57
Volatile Organic Compounds	44.51	24.20
Lead	--	--
Hazardous Air Pollutants (Specify Each Pollutant)		

Table 3-2 Facility-wide (Stationary Source) Potential to Emit Pounds Per Hour and Tons Per Year

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)
N-Hexane	0.090	0.218
Formaldehyde	0.060	0.247
Acetaldehyde	0.004	0.014
Ethylbenzene	0.002	0.011
Benzene	0.004	0.005
Toluene	0.011	0.044
Xylenes	0.006	0.022
Acrolein	0.001	0.002
H_2S	0.16	0.69
Other Regulated Pollutants (Specify)	n/a	n/a

Source: Class II Air Permit No. AP2869-2382

Table 3-3 Maximum Predicted Ambient Air Quality Impacts Compared to Ambient Air Quality Standards (Class II Air Permit No.AP-2869-2382)

Pollutant	Averaging Period	Maximum Predicted Impact ($\mu g/m^3$)[(1)]	Nevada/National AAQS ($\mu g/m^3$)
NO_2	Annual	28[(2)]	100
SO_2	3-hour	339	1,300
	24-hour	131	365
	Annual	7.9	80
PM_{10}	24-hour	90	150
	Annual	16	50[(3)]
CO	1-hour	785	40,000
	8-hour	241	10,000
Ozone	1-hour	29[(4)]	235[(5)]
H_2S	1-hour	9.2	112[(6)]

1 Maximum predicted impact includes background concentrations for NO_2, SO_2, and PM_{10}.
2 NO_2 concentration assume 100 percent conversion from NO_x to NO_2.
3 Annual PM_{10} is a state only standard.
4 Ozone concentrations predicted by Scheffe Method, as described in the application.
5 Represents the 1-hour ozone standard (in Nevada regulations). The modeled impact of 28 $\mu g/m^3$ for 1-hour assured compliance with the federal ambient air quality standard of 75 ppb or 147 $\mu g/m^3$ on an 8-hour fourth-highest impact.
6 H_2S standard is state-only.

Greenhouse Gases and Global Climate Change

While the scientific understanding of climate change continues to evolve, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report has stated that warming of the Earth's climate is unequivocal, and that warming is very likely attributable to increases in atmospheric greenhouse gases caused by human activities (anthropogenic) (IPCC Fourth Assessment Report, Climate Change 2007: Synthesis Report (2007 IPCC Report)). The IPCC's Fourth Assessment Report indicates that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts are linked to changes in the climate system, and that some changes may be irreversible (IPCC 2007).

Construction of the Facility will result in the minor emissions (a total of 4,080 tons per year of CO_2-equivalent) of greenhouse gases emitted as a result of construction and transportation activities related to the Facility.

Once operational, the proposed Facility will use sorted MSW to generate syngas and ethanol for consumption as a transportation fuel. Approximately one-third of the syngas generated at the Facility will be used as fuel in a combustion turbine and combined heat recovery steam turbine to generate electric power for use on the Site. The remainder of the syngas will be converted into ethanol for use as a transportation fuel, replacing gasoline as fuel in motor vehicles (or other similar uses). A comparative calculation of greenhouse gas emissions, in CO_2-equivalent was made between the Facility-produced ethanol and conventional gasoline to determine the annual net savings in CO_2-equivalent GHG (Unnasch and Wiesenberg 2009). In producing ethanol, and ultimately combusting the ethanol as a replacement for gasoline, the total annual GHG emissions will be 18,300 tons per year. This effectively replaces 85,000 tons per year of GHG emissions that will be emitted from the production and combustion of conventionally produced gasoline, resulting in a net savings of 66,700 tons of CO_2-equivalent GHG per year.

The release of anthropogenic greenhouse gases and their potential contribution to global warming are inherently cumulative phenomena. Greenhouse gas emissions from the proposed Facility are relatively small compared to the 8,026 million tons (7,282 million metric tonnes) of CO_2-equivalent greenhouse gases emitted in the U.S. in 2007 (Energy Information Administration, Report # DOE/EIA-0573 [2007]) and the 54 billion tons (49 billion metric tonnes) of CO_2-equivalent anthropogenic greenhouse gases emitted globally in 2004 (IPCC 2007). The GHG emissions from the proposed Facility in combination with past and future emissions from all other sources would contribute incrementally to the climate change impacts described above. However, the GHG emissions caused by construction and operation of the proposed Facility will be more than offset by the annual net savings in CO_2-equivalent (66,700 tons per year) that will result by the production and consumption of the Facility-produced ethanol. At present there is no methodology that would allow DOE to estimate the specific impacts (if any) this increment of climate change would produce in the vicinity of the Facility or elsewhere. The process to be used at the Facility could also address the issue of impact on food availability and price due to use of food crops for ethanol production since the feedstock would be MSW which is typically disposed of in landfills or by incineration.

The Facility would produces 10.5 million gallons of ethanol annually; use of corn for this level of production would require 3.5 million bushels of corn.[13]

3.9.2.2 No Action Alternative

Given that the Site is zoned for industrial development, emissions from existing developments at the Site would continue and new emissions would be created as additional developments are approved. Fugitive dust would continue to occur on-site as travel on unpaved roads and construction of other facilities nearby continues. The benefits of avoided emissions and other air pollutants by replacing fossil-fuel-fired electric generation would not occur.

3.10 Cultural Resources

3.10.1 Affected Environment

Cultural resources include "historic properties" as defined in the National Historic Preservation Act (NHPA) of 1966, as amended, "archaeological resources" as defined in the Archaeological Resources Protection Act (ARPA) of 1979, as amended, and "cultural items" as defined in the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990. Cultural resources include, but are not limited to, the following broad range of items and locations:

- Archaeological materials (i.e., artifacts) and sites that date to the prehistoric, historic, and ethnohistoric periods currently located on, or buried beneath, the ground surface;
- Standing structures that have an important technological, architectural, or local significance;
- Cultural and natural places, select natural resources, and sacred objects that have importance for Native Americans; and
- American folk life traditions and arts (DOE 2006).

3.10.1.1 Regulatory Framework

Federal historic preservation legislation provides a legal environment for documentation, evaluation, and protection of cultural resources that may be affected by federal or private undertakings operating under federal license, with federal funding, or on federally managed lands. These include, but are not limited to, the NHPA, ARPA, and Archaeological and Historic Preservation Act of 1974. Executive Order 11593 also provides necessary guidance on protection and enhancement of cultural resources.

The NHPA requires Federal agencies to take into account the effects of their actions on properties listed on or eligible for listing on the National Register of Historic Places (NRHP). Section 106 of the NHPA establishes a four-step review process by which cultural resources are given consideration during the evaluation of proposed undertakings. The regulations require that federal agencies initiate Section 106 early in the project planning, when a broad range of alternatives can be considered (36 CFR 800.1[c]).

[13] See http://chooseethanol.com/pages/quick-facts/

The effects of federal undertakings on properties of religious or cultural significance to contemporary Native Americans, including traditional cultural properties, are given consideration under the provisions of the American Indian Religious Freedom Act of 1978, NAGPRA, and recent amendments to the NHPA. As amended, the NHPA now integrates Indian tribes into the 106 compliance process and also strives to make the NHPA and NEPA procedurally compatible. Furthermore, Indian tribes are granted a measure of authority over procedures that are to be taken when unmarked human remains of Native American affiliation are discovered on federal lands.

Section 106 of the NHPA requires that Federal agencies take into account the effect of an undertaking on historic properties and provide the Advisory Council on Historic Preservation an opportunity to comment. Historic property, as defined by the regulations implementing Section 106, means "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the NPS." The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria.

Potential impacts to historic properties are assessed using the "criteria of adverse effect" (36 CFR 800.5[a] [1]), as defined in the implementing regulations for the NHPA. "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." Adverse effects include not only the physical disturbance of a historic property, but also may include the introduction, removal, or alteration of various visual or auditory elements, which could alter the traditional setting or ambience of the property.

3.10.1.2 Eligibility Criteria for Listing Cultural Resources on the NRHP

The NRHP, maintained by the National Park Service (NPS) on behalf of the Secretary of the Interior, is the nation's inventory of significant cultural resources. The NPS has established three main standards that a resource must meet to qualify for listing on the NRHP (age, integrity, and significance). To meet the age criteria, a resource generally must be at least 50 years old. To meet the integrity criteria, a resource must "possess integrity of location, design, setting, materials, workmanship, feeling, and association" (36 CFR 60.4). Finally, a resource must be significant according to one or more of the following criteria:

- Be associated with events that have made a significant contribution to the broad patterns of U.S. history (Criterion A);
- Be associated with the lives of persons significant in U.S. history (Criterion B);
- Embody the distinctive characteristics of a type, period, or method of construction or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction (Criterion C); or
- Have yielded, or may likely yield, information important in prehistory or history (Criterion D) (NPS 1995).

3.10.1.3 Cultural Overview

Traditionally, the Northern Paiute inhabited eastern California, western Nevada, and southeast Oregon. Their pre-contact lifestyle was well adapted to the harsh desert environment in which they lived. Each tribe or band occupied a specific territory, generally centered on a lake or wetland that supplied fish and waterfowl. They lived a seasonal semi-nomadic life style. In the winter, they occupied dome-shaped, mat-covered houses, while in the summer they utilized windbreaks or sun shades. Subsistence strategies included hunting, plant gathering, and fishing. Pine nuts, various seeds, roots, and berries were important plant resources. Communal hunting utilizing traps or corrals were used for large game such as antelope, deer, and desert bighorn sheep. Small game included rabbits, marmots, ground squirrels, grouse, waterfowl, and insects (e.g., grasshoppers) (Fowler and Liljeblad 1986).

Relations among the Northern Paiute bands and their Western Shoshone neighbors generally were peaceful. In fact, they were culturally similar with no clear distinction between the two. However, relations with the Washoe people, who were culturally and linguistically very different from the Northern Paiute and Western Shoshone, were not so peaceful (Bengston 2003).

Contact between the Northern Paiute and Euroamericans came in the early 1840s, although the first contact may have occurred as early as the 1820s. Although the Northern Paiute had already started using horses, their culture was otherwise unaffected by Euroamerican influences at that time. As Euroamerican settlement of the area increased, several violent confrontations occurred, including the Pyramid Lake War of 1860, Owens Valley Indian War 1861-1864, Snake War 1864-1868, and the Bannock War of 1878. These conflicts generally started as disagreements between settlers and Paiutes over property, retaliation by one group against the other, or a result of the depletion of the tribe's traditional food base (Bengston 2003).

The Malheur Reservation was established in eastern Oregon for the Northern Paiute on September 12, 1872, with the intent of concentrating the Indians of the area on this reservation. However, the strategy failed. Due to the distance of the reservation from the traditional lands of the Paiute, and poor conditions on the reservation, many Northern Paiute refused to relocate, and those that did soon left. The Paiute held onto their traditional life styles as long as possible, but when the depletion of their traditional resources made that impossible, they took jobs on white farms and ranches, or in cities, and established small Indian colonies (Bengston 2003). Later, large reservations were created at Pyramid Lake (1874) and Duck Valley (1877), but by that time the pattern of small colonies near cities or farm districts had been established. Starting in the early 20th century, the U.S. government began granting land to these colonies, and under the Indian Reorganization Act of 1934, these colonies gained recognition as independent tribes.

The Reno-Sparks Indian Colony, which is located approximately 15 miles west of the Site, is a federally recognized Indian Tribe located near Reno, Nevada (http://www.rsic.org/). The Colony was established in the early 1900s and formed a more formal tribal government in 1935 under the Indian Reorganization Act. Membership consists of over 900 members from three Great Basin tribes: Paiute, Western Shoshone, and Washoe. The reservation lands consist of the original 28-acre residential Colony located in downtown Reno and the 1,960-acre Hungry Valley Reservation located 19 miles north of the downtown Colony.

The Facility will be located in Storey County, where, in 1859 gold was discovered, prompting a rush from the mining districts of California. Soon after, a rich gold strike (the Comstock Lode, containing 57 percent silver, 42 percent gold) was discovered in Gold Hill by "Old Virginia" H.T.P. Comstock. With the Comstock Lode, the area became known as "The Richest Place on Earth." Storey was made a county by an act of the first territorial legislature on November 25, 1861. It was named after Captain Edward Faris Storey, one of the first residents of Virginia City and a commander in the Pyramid Lake War of 1860. Mining declined over the next several decades and has since given way to tourism as the leading factor in the county's economy (http://www.regionaldatacenter.com/RDC/ Storey County/ index.aspx).

3.10.1.4 Cultural Resources Investigations

On November 19-20, 2008, Summit Envirosolutions, Inc. (Summit) conducted a Class I files search through the Nevada Cultural Resources Information System and Nevada State Museum (Summit 2008). The files search was conducted to identify any previously conducted cultural resource inventories or previously recorded cultural resources within a 1-mile radius of the Site. Historic maps, General Land Office plats, and the Nevada Division of State Lands database also were examined for possible historic features (e.g., roads, ditches, trails, structures) in the files search study area.

No cultural resources have been found on the Site. Within one mile of the Site, a cultural resources inventory was conducted that identified one archaeological site and six isolated finds. The archaeological site is a small prehistoric lithic scatter consisting of four flakes. The isolated finds include four prehistoric flakes, one historic canning lid band, and a historic cadastral marker (a metal marker used to create, mark, and define, retrace, resurvey and reestablish the boundaries and subdivisions of the public lands of the United States). None of these previously recorded cultural resources are eligible for the NRHP. With the exception of two unimproved two-track roads, no historic features were identified in the files search study area. The literature search and the previous survey near the Site indicate that the potential for undiscovered significant cultural resources on and near the Site is very low. The Site is located outside the foothills of the Virginia Range, which is rich in both prehistoric and historic-period resources, and is situated in an area of desert pavement with low shrubby vegetation where the potential for intact significant cultural resources is limited. In addition, since the Facility is sited on a tract of land that already has been developed for the TRI Center, there is a low probability of any intact resources remaining at the Site. The Site has been modified through extensive grading and filling of the surface terrain; and service utilities, including roadways and rails, are already constructed to serve the Site.

3.10.1.5 Tribal Consultation and Coordination

On December 28, 2010 DOE wrote to six Native American Tribes in Nevada that have an historical interest in Storey County, Nevada (Appendix B). DOE extended the Tribes an opportunity to engage with DOE in government to government consultation on the proposed Facility. DOE provided a description of the project and a map with its letter. No Tribes indicated an interest in consultation with DOE on the proposed Facility loan guarantee.

3.10.2 Environmental Effects – Cultural Resources

3.10.2.1 Proposed Action

Since no cultural resources have been identified at the Site and the Site has been heavily disturbed as a result of previous grading activity and nearby industrial development, no direct impacts to cultural resources are anticipated. Activities associated with constructing the Facility could possibly adversely affect undiscovered cultural resources. If a cultural resource is encountered during construction, construction will cease within the vicinity of the discovery until the Nevada SHPO and interested Tribes can evaluate the discovery. Construction would not proceed until authorized by the State Historic Preservation Officer (SHPO). Treatment of any discovered cultural material would be handled in accordance with SHPO policy.

If construction or other Sierra BioFuels personnel discover what they believe to be human remains, funerary objects, or items of cultural patrimony, construction will cease within the vicinity of the discovery, a reasonable effort would be made to protect the items discovered, and local law enforcement officials would be notified of the find. Treatment of any discovered human remains and associated funerary objects would be handled in accordance with the provisions of NAGPRA and/or applicable Nevada law. Construction would not resume in the area of the discovery until the SHPO has issued a notice to proceed.

On January 14, 2011, DOE advised the Nevada SHPO of its determination that the proposed construction and operation of the Facility would have no adverse effect on historic properties (see letter at Appendix D). On February 14, 2011, the SHPO concurred with DOE's determination (see Appendix D).

3.10.2.2 No Action Alternative

Given that the Site is zoned for heavy industrial development, impacts to any possible cultural resources at or near the Site would continue from existing and new developments proposed within the TRI Center industrial park.

3.11 Socioeconomic Impacts

3.11.1 Affected Environment

The Site is located in an industrial area that is isolated from communities. The Site is 8 miles east of Sparks, Nevada, and north of the Virginia City community, which is not directly accessible from the TRI Center. Due to the isolated and unpopulated nature of the area, there is no accurate depiction of socioeconomic data for the Site. The U.S. Census Bureau and Bureau of Labor Statistics group the Site and TRI Center with Sparks.

3.11.2 Environmental Effects – Socioeconomics

3.11.2.1 Proposed Action

The Facility would add additional employment during construction and operation (up to 53 full-time jobs), and socioeconomic benefits to the surrounding areas will likely occur. Businesses and work forces in the nearby communities of Sparks and Reno, Nevada, would be the likely benefactors. Due to the unpopulated and remote nature of the TRI Center industrial area, no other socioeconomic effects will occur that would affect existing communities or populations.

3.11.2.2 No Action Alternative

Without the Facility, socioeconomic benefits as a result of the Facility would not occur; however, employment may be added as a result of other proposed developments at the TRI Center.

3.12 Environmental Justice

3.12.1 Affected Environment

The Site is located in an industrial area that is isolated from communities. There are no residences, churches, schools, cultural centers, parks, or playgrounds within 5 miles of the Site and the nearest residence is 6 miles from the Site in Lovelock Nevada. There is no foot traffic in the Site area. The Site is 8 miles east of Sparks, Nevada, and north of the Virginia City community, which is not directly accessible from the TRI Center.

3.12.2 Environmental Effects – Environmental Justice

3.12.2.1 Proposed Action

Since there are no communities in proximity to the Site, there are no environmental justice population concerns present.

3.12.2.2 No Action Alternative

In view of the isolated nature of the Facility there will not be any environmental justice concerns if the Facility is not built, or if the site is used for another industrial purpose.

3.13 Visual Resources

3.13.1 Affected Environment

The visual character of the Site has been highly modified from its natural state. Modifications to the natural setting include roads, rail spurs, utility infrastructure, and industrial developments. In addition to the substantial human modifications the overall existing scenic quality of the landscape is also considered low because it lacks a variety and contrast in natural features, landforms, and vegetation. Given that the Site is located on the interior of an industrial center, sensitive visual receptors are limited to other industrial developments at the TRI Center. There are no residences within the viewshed. Travelers on I-80 and other areas outside the site would see other industrial developments around the Site that are closer to the interstate, but would not see the Facility as it is 3 miles south of the interstate and shielded from viewers by surrounding topography.

3.13.2 Environmental Effects – Visual Resources

3.13.2.1 Proposed Action

Visual effects resulting from the development of the Site will introduce new elements into the visual landscape, and will alter the form, line, color, and texture that characterize the existing landscape. The proposed Facility will result in the introduction of structural elements that are visually similar to existing conditions and landscape character (i.e. a modified landscape with varying levels of industrial infrastructure). As such, the visual contrast associated with the Facility itself compared to the surrounding area would be low and would not attract the attention of the casual observer.

The Storey County Zoning Ordinance specifies that buildings within the I-2 Heavy Industrial Zone should not have a height greater than 75 feet and a special use permit would be required if the Facility exceeds these limits (Section 17.37.080). Since the original design of the Facility includes buildings that would exceed the zoning ordinance building height limitations, the Storey County Planning Commission authorized an exception to allow a building up to 90 feet tall through the original Special Use Permit. Fulcrum's redesign of the Facility does not include buildings above 75 feet in height, but the exception was retained in the Special Use Permit. Since the Facility will be located in an industrial park with low scenic quality, visual impacts of structures will be minimal.

3.13.2.2 No Action Alternative

Given that the Site is zoned for heavy industrial development, changes to the visual character of the landscape that alter the form, line, color, and texture will likely occur regardless of the Facility as a result of existing and new developments proposed within the TRI Center industrial park.

3.14 Noise

3.14.1 Affected Environment

Noise is often defined as "unwanted sound." Sounds are described as noise if they interfere with an activity or disturb the person hearing them. Sound levels fluctuate with time depending on the sound source audible at a specific location. Additionally, the degree of annoyance associated with certain sounds can vary by time of day, depending on other sound sources affecting a receiver and the activities of the receiver. For example, the interruption of sleep can be very annoying.

The Site is located within an existing industrial park, with the main sources of noise associated with industrial operations, construction of new buildings, and road traffic. There are no sensitive noise receptors near the Site, since the closest residence is approximately 6 miles away in Lockwood on the opposite side of I-80 from the TRI Center.

The Storey County Zoning Ordinance specifies that within I-2 zones "noise, smoke, odor, gases, or other noxious nuisances shall be controlled so as not to become objectionable, or adversely affect the properties in the vicinity, and shall not be detrimental to the public health, safety and welfare" (17.12.100).

3.14.2 Environmental Effects – Noise

3.14.2.1 Proposed Action

Noise is not anticipated to be an issue for surrounding landowners, as surrounding land-use in the area also is heavy industrial. Also, Feedstock processing operations would be performed in the enclosed Feedstock processing building, which would inhibit the propagation of noise from the process operations.

3.14.2.2 No Action Alternative

Given that the Site is zoned for heavy industrial development, industrial noise will likely occur regardless of the Facility as a result of existing and new developments proposed within the TRI Center industrial park.

3.15 Public Health and Safety

3.15.1 Affected Environment

A Phase I Environmental Site Assessment (AECOM 2008) completed for the Site revealed no evidence of recognized environmental conditions in connection with the Site. The Site was not identified on any database listings within the American Society for Testing and Materials-specified database report by Environmental Data Resources, Inc. The nearest property identified on the database report was located approximately 0.75 miles northeast and topographically downgradient of the Site.

The Facility would use and produce hazardous materials and industrial wastes, which are detailed in Section 2.1.4.10 and Section 2.1.4.11, and will be operated in accordance with the Occupational Safety and Health Administration (OSHA) standards[14].

3.15.2 Environmental Effects – Public Health and Safety

3.15.2.1 Proposed Action

The Facility would use and produce hazardous materials and waste. Ethanol produced by the Facility would be primarily marketed as a gasoline additive to various end-users (e.g., bulk terminals, refineries, etc.). The inert material and process residue would be transported to an appropriate disposal site. Residual metals would be stored in on-site containers until a sufficient quantity is developed to warrant transportation to a recycler.

Industrial chemicals used by the Facility would be stored, handled, and used in accordance with all applicable local, state, and federal regulations. While a potential for spills would exist at the Facility because of the nature of the operations, no direct effects would be anticipated as a result of the Facility since it will develop and implement an active program to clean up spills, require covered or enclosed delivery of Feedstock, and ensure adequate passive protection around all storage tanks at the Facility.

Routine operation and maintenance of the proposed Facility would require the use of several materials that require special handling. Operation of the Facility will be performed in accordance with the Site Safety Plan, which requires accident reporting, electrical safety, fire protection, and the use of personal protective equipment. This plan is expected to minimize impacts to workers' health and safety during operation. In addition, all operation activities would be carried out in compliance with OSHA requirements that would include personal protective equipment (e.g. masks, protective clothing) and standard operating procedures to reduce potential accidents.

There will be a potential for fire associated with operation of the Facility. However, a 600,000-gallon fire water storage tank will be constructed on-site. A fire protection plan will also be developed (see plan details at Section 2.1.4.15). These measures are designed to reduce the potential

[14] Occupational health and safety rights for both workers during the construction and operation phases of the Facility are protected through the federal Occupational Safety and Health Act (29 USC 651 et seq.). Under this act, Congress created the Occupational Safety and Health Administration (OSHA), an agency of the U.S. Department of Labor. OSHA's mission is to assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.

for fire associated with Facility operations. Further, there are no buildings or structures that would impede fire-fighting activities, and there would be no off-site abutting or nearby structures that would be directly affected by fires at the Facility. Finally, the nearest residence is more than 6 miles from the Facility and the nearest industrial/commercial structure is 0.3 miles away, which effectively eliminates the possibility of fire spreading beyond the Facility.

Intentional Destructive Acts

The DOE believes that the Facility would present an unlikely target for intentionally destructive acts (terrorism or sabotage) and would have an extremely low probability of being attacked. Protective fencing would be constructed around the perimeter of the Site within which all proposed activities would be confined. Public access to the host Site would be restricted to a gated single main entrance, which would be continuously monitored. Nighttime security lighting would be used, which would also benefit the safety of the workers and public in the operation of the Facility. The Facility would be continuously operated and under worker surveillance 24 hours a day, 7 days a week. All areas of the Facility buildings would be access controlled. All authorized personnel (employees and contractors) will be issued access key fobs to regulate entry into each closed Facility building, including office and processing areas. Storage and use of hazardous materials would comply with federal, state, and local regulatory requirements. Thus, the potential for impacts from intentionally destructive acts is considered to be very low. Nevertheless, if destructive acts were somehow to occur, the consequences would not exceed those set forth in the fire risk scenarios presented above.

3.15.2.2 No Action Alternative

Under the no action alternative, there would be no direct effects from public health and safety as a result of the Facility. It is possible that another industrial use would present similar potential health and safety effects.

4.0 Cumulative Environmental Impacts

The term "cumulative effect" is defined in the CEQ regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7).

This chapter provides an overview of relevant past, present, and reasonably foreseeable actions in the vicinity of the Facility and presents the cumulative effects analysis. Given the large area and isolated nature of the TRI Center development where the Facility is proposed, the area of potential impacts to resources is within the 107,000-acre development. The temporal boundary is the build-out of the TRI Center (25 years or more) and the 25-30 year life of the Facility.

The only areas where the Facility would make a measurable incremental contribution to a cumulative impact are vegetation, wildlife (including special status species), visual resources, and air quality. The sections below address these areas in more detail.

4.1 Past, Present, and Reasonably Foreseeable Future Actions

Before the TRI Center industrial development, the area was undeveloped land originally purchased by Curtis Wright Company in the 1940s and then by Gulf Oil (BC Environmental, Inc 2000). Most areas in the TRI Center are arid undeveloped open space and have not been previously used by man, except for sparse livestock grazing.

As stated in Section 3.2.1.1, the TRI Center is an active industrial center with a capacity of 100-million-square-feet of industrial space. Companies already at the TRI Center include Kal Kan Pet Foods; APL Logistics (distributors of Dell Computers); Alcoa (an aluminum micromill); James Hardie; Royal Sierra Extrusions; Golden Gate Petroleum; a Wal-Mart distribution center; Trans Western Polymers; and Frank-Lin rectifiers. Three gas-fired power plants also are located at the TRI Center: NV Energy, Inc., Barrick Mines, and Naniwa (a power plant that provides additional power support during peak hours). Currently, the closest developed property to the proposed Site is an auto auction facility located 0.3 mile south of the Site. Continued development of the TRI Center is anticipated to occur over an approximate 25-year period or until build out occurs on the 107,000 acre property. Of the 107,000-acre property, 30,000 acres are considered developable for industrial and manufacturing uses (sites with topography of less than 6 percent slope). The remaining 77,000 acres contain sloping topography that is not suitable for industrial buildings or warehouses, but is suitable for other types of developments including wind turbines and solar panels.

Other developments in the project vicinity include the former Tracy Power Plant, which had been located on adjacent land immediately north and approximately 3 miles from the Site. In addition, the Nevada Department of Transportation constructed a new I-80 interchange located approximately 3 miles north of the Site; this interchange is the current USA Parkway exit off of I-80 (Nevada Department of Transportation and United States Department of Transportation Federal Highway Administration 2002).

4.2 Cumulative Analysis

This analysis addresses resources that may be subject to cumulative impacts from the Facility in combination with other actions that have taken place or are expected to take place in the area.

4.2.1 Vegetation

Development of the Facility will remove the remaining sagebrush vegetation and understory grasses on the 16.77-acre parcel in an area that is already disturbed from other construction activities within the TRI Center and from grading that has already occurred on portions of the Site. The Facility's increment will remove less than 0.06 percent of the overall cumulative vegetation removal that will result from similar developments within 30,000 acres of the TRI Center and 0.02 percent of the overall vegetation within the entire 107,000-acre TRI Center. Since the area is zoned for industrial development, this impact will likely occur regardless of the Facility since another industrial facility will probably be built at the Site if the Facility is not built on this Site. The sagebrush vegetation and understory grasses within the TRI Center are typical of the surrounding area and do not contain any unique or significant vegetation species. This ecological system occurs throughout much of the western U.S. (NatureServe 2008). Consequently, no is significant cumulative effects from the project's removal of vegetation is expected.

4.2.2 Wildlife and Fisheries

Development of the Facility will remove the remaining potential wildlife habitat on the 16.77-acre parcel in an area that is already disturbed from other construction activities within the TRI Center and from grading that has already occurred on portions of the Site. This effect is 0.06 percent of the overall cumulative impact of removing approximately 30,000 acres within the TRI Center for similar industrial buildings and 0.02 percent of the overall disturbance that will occur within the entire 107,000-acre TRI Center.

The Facility will have no impact on fisheries resources due to a lack of perennial water sources near the Site. No significant cumulative effects on wildlife and fisheries are expected from the construction or operation of the proposed project.

4.2.3 Special Status Species

Since there are no federally listed plant or wildlife species at the Site, no cumulative impacts to federally listed species will occur. Since there are no known occurrences of state listed or sensitive plant species at the Site, no cumulative impacts to special status plant species will occur.

Development of the Facility will disturb the 16.77-acre parcel and remove potentially suitable habitat for state-listed or sensitive mammal and bird species, including migratory bird species. The Facility impact is part of a larger cumulative impact of the planned removal of 30,000 acres from similar industrial buildings and installing other developments such as wind turbines and solar panels on the remaining 77,000 acres. However, due to the large amount of suitable habitat in the vicinity of the Site and beyond the TRI Center, impacts to these species are expected to be minimal. The potential habitat consisting of sagebrush vegetation and understory grasses within the TRI Center are typical of the surrounding area and do not contain any unique or significant vegetation species. This ecological system occurs throughout much of the western U.S. (NatureServe 2008).

4.2.4 Air Quality

As discussed in Section 3.9.2, the Facility will emit less than 100 tons per year of any criteria pollutant, and is considered by NDEP to be a minor source for air emissions. The area currently meets ambient air quality standards. All projects are required to comply with NDEP air permitting requirements to prevent construction and operations emissions from exceeding applicable thresholds. Therefore it is not expected that there will be significant[15] cumulative impacts associated with Facility.

4.2.5 Visual Resources

The proposed Facility will result in the introduction of structural elements that are visually similar to existing conditions and landscape character (i.e. a modified landscape with varying levels of industrial infrastructure). This is a part of the cumulative effect on visual resources from converting unoccupied land into an industrial area. Given the unpopulated and remote nature of the TRI Center area, no significant cumulative effects are expected as no sensitive receptors will be affected by this change in the visual character of the area.

[15] Cumulative effects on air quality are addressed as part of the air permit application, by adding background concentrations (from other sources) to the modeled impact of the Facility. In its review of the air permit application, NDEP determined that the cumulative air quality impacts would not exceed the ambient air quality standards. The three power plants in the TRI Center are gas-fired and were included in the NDEP analysis of the incremental impacts of the Sierra BioFuels Facility.

5.0 List of Preparers and Reviewers

As required by NEPA regulations (40 CFR § 1502.17), **Table 5-1** lists the people responsible for preparing this EA. DOE has retained AECOM as a third-party consultant to assist with the preparation of this EA. AECOM has certified that it does not have any financial or other interest in the decisions to be made pursuant to this EA.

Table 5-1 List of Preparers and Reviewers

Contact	Qualifications	Role
U.S. Department of Energy, Loan Guarantee Program Office		
Matthew McMillen	MS, Natural Resources Development BS, Environmental Science Years of Experience: 26	Director, Environmental Compliance
Joseph Montgomery	IBM Years of Experience: 40	Consultant
Fulcrum Sierra BioFuels, LLC		
Jeanne Benedetti	BS, Chemical Engineering MS, Business Administration Juris Doctor Years of Experience: 25	Vice President
Ted Kniesche	BA, Economics Years of Experience: 7	Vice President
AECOM		
Jen Ashlin	BS Geology and Environmental Science Years of Experience: 10	Water Resources, Soils and Geology
Matt Brekke	BS Wildlife Biology Years of Experience: 4	Wildlife and Fisheries, Special Status Species, Vegetation
Bruce Macdonald	PhD Atmospheric Science MS Atmospheric Science BA Mathematics Years of Experience: 35	Project Lead, Air Quality
Melanie Martin	MS Environmental Policy and Natural Resource Management BS Agriculture, Environmental Protection Years of Experience: 13	NEPA Lead, Document Preparation
Kim Munson	MA Anthropology BA Anthropology Years of Experience: 18	Cultural Resources

Table 5-1 List of Preparers and Reviewers

Contact	Qualifications	Role
Todd White	MDP Masters in Community Planning MEn Masters in Environmental Science MA Anthropology BA Geology Years of Experience: 14	GIS

6.0 List of Agencies, Organizations, and Persons Contacted

The following sections identify the agencies and Native American tribes contacted during preparation of this EA.

6.1 State Agencies

Ronald M. James
State Historic Preservation Officer
State Historic Preservation Office
100 North Stewart Street
Carson City, Nevada 89701

Randy Phillips
Bureau of Air Pollution Control
Nevada Department of Environmental Protection
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701

Mark Kaminski, PE
Bureau of Water Pollution Control
Nevada Department of Environmental Protection
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701

6.2 Local Agencies

Storey County Board of County Commissioners
26 B Street
Virginia City, Nevada 89440

6.3 Native American Tribes

Fort McDermitt Paiute and Shoshone Tribes
PO Box 457
McDermitt, Nevada 89421

Paiute-Shoshone Tribe of the Fallon Reservation
565 Rio Vista Drive
Fallon, Nevada 89406

Pyramid Lake Paiute Tribe of the Pyramid Lake
PO Box 256
Nixon, Nevada 89424

Reno-Sparks Indian Colony
98 Colony Road
Reno, Nevada 89502

Walker River Tribe of the Walker River
PO Box 220
Schurz, Nevada 89427

Yearington Paiute Tribe of the Yearington Colony
171 Campbell Lane
Yerington, Nevada 98447

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APPENDIX A LETTER OF INTENT TO PREPARE EA

Department of Energy
Washington, DC 20585

NOV 2 4 2009

Clearinghouse Coordinator
Nevada State Clearinghouse
Department of Administration
209 East Musser St., Room 200
Carson City, NV 89701-4298

SUBJECT: Intent to Prepare an Environmental Assessment (EA) for a proposed Federal Loan Guarantee for a Biofuels Facility in Nevada

Under Title XVII of the Energy Policy Act of 2005 (EPAct 05), the U.S. Department of Energy (DOE) is proposing to provide a Federal loan guarantee to Fulcrum Sierra Biofuels, LLC (FSB) for the construction and startup of a waste-to-ethanol facility (the Facility) in McCarran, Storey County, Nevada. The decision to prepare an EA was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

The purpose of and need for agency action is to comply with DOE's mandate under Title XVII of EPAct 05 by selecting eligible projects that meet the goals of the Act. DOE is using the NEPA process to assist in determining whether to issue a loan guarantee to FSB to support the proposed project. The Facility would use state-of-the-art, non-combustion, thermo chemical conversion technology to convert feedstock composed of the organic component of municipal solid waste into cellulosic ethanol. The plant will produce 10.5 million gallons of ethanol annually along with 16 megawatts of renewable electricity by processing post-sorted municipal solid waste -- household garbage. When operational in 2012, the project will reduce dependence on foreign oil, lower carbon emissions and stimulate economic growth in Northern Nevada.

According to a life cycle analysis conducted by DOE based on information provided by FSB, the proposed project is expected to result in an avoidance of greenhouse gas emissions equivalent to 1,322,786 tons of carbon dioxide over twenty years compared to production of corn ethanol, currently the main feedstock for production ethanol.

DOE NEPA regulations provide for notifying host states and tribes of NEPA determinations and for the opportunity for host states and Tribes to review EAs prior to DOE approval. This process is intended to improve coordination and to facilitate early and open communication. DOE will provide the Draft EA to the state of Nevada as well as Storey County and interested Indian Tribes. DOE will request that comments be provided within a three-week review period.

Printed with soy ink on recycled paper

If you or your staff would like to receive further information concerning this project or DOE's NEPA process for Federal energy loan guarantees, please contact Mr. Matthew McMillen in DOE Loan Program Office at 202-586-7248 or email him at Mathew.McMillen@hq.doe.gov. You may also contact Joseph Montgomery, consultant to the DOE Loan Program Office at 202-586-7438 or email at Joseph.Montgomery@hq.doe.gov.

Sincerely,

Jonathan M. Silver
Executive Director
Office of Loan Programs

cc: Storey County Board of County Commissioners
Fort McDermitt Paiute and Shoshone Tribes
Paiute-Shoshone Tribe of the Fallon Reservation
Pyramid Lake Paiute Tribe of the Pyramid Lake
Reno-Sparks Indian Colony
Walker River Tribe of the Walker River
Yerington Paiute Tribe of the Yerington Colony

APPENDIX B GREENHOUSE GAS EMISSIONS DURING CONSTRUCTION

Fulcrum Sierra BioFuels LLC

Criteria and Carbon Dioxide Emissions from Construction

						Pollutant					
						NOx	**SO2**	**VOC**	**PM/ PM_{10}**	**CO**	**CO_2**
Emission Factor (lb/hp-hour)						0.0152	0.00205	0.0022	0.0013	0.009	1.15
Regular Work Week (days/week)			6								
UNIT	**Horse-power**	**Hours/ day**	**Days/ week**	**Unit - Weeks**	**Total Hours**	**Total Emissions (tons)**					
Air Compressors	175	10	6	12	720	0.96	0.13	0.14	0.08	0.57	72.45
Backhoes	75	10	6	11	660	0.38	0.05	0.05	0.03	0.22	28.46
Bob Cats	50	10	6	36	2,160	0.82	0.11	0.12	0.07	0.49	62.10
Concrete Pumping	75	10	6	24	1,440	0.82	0.11	0.12	0.07	0.49	62.10
Cranes	300	10	6	36	2,160	4.92	0.66	0.71	0.42	2.92	372.60
Dozers	100	10	6	8	480	0.36	0.05	0.05	0.03	0.22	27.60
Dump Trucks	600	10	6	8	480	2.19	0.30	0.32	0.19	1.30	165.60
Fork Lifts	75	10	6	104	6,240	3.56	0.48	0.51	0.30	2.11	269.10
Grout Pump	300	10	6	24	1,440	3.28	0.44	0.48	0.28	1.94	248.40
Site Graders	300	10	6	14	840	1.92	0.26	0.28	0.16	1.13	144.90
Road Graders	300	10	6	6	360	0.82	0.11	0.12	0.07	0.49	62.10
Scissor Lift	80	10	6	104	6,240	3.79	0.51	0.55	0.32	2.25	287.04

UNIT	Horse-power	Hours/ day	Days/ week	Unit - Weeks	Total Hours	Total Emissions (tons)	UNIT	Horse-power	Hours/ day	Days/ week	Unit - Weeks
Rollers	75	10	6	14	840	0.48	0.06	0.07	0.04	0.28	36.23
Track Hoes	100	10	6	11	660	0.50	0.07	0.07	0.04	0.30	37.95
Tractors	300	10	6	104	6,240	14.23	1.92	2.06	1.22	8.42	1076.40
Packers	25	10	6	14	840	0.16	0.02	0.02	0.01	0.09	12.08
Water Pumps	100	6	6	104	3,744	2.85	0.38	0.41	0.24	1.68	215.28
Water Trucks	300	6	6	104	3,744	8.54	1.15	1.24	0.73	5.05	645.84
Generators	25	10	6	104	6,240	1.19	0.16	0.17	0.10	0.70	89.70
Pressure Washers	11	10	6	12	720	0.06	0.01	0.01	0.01	0.04	4.55
1-Ton Pickup *	300	1	6	104	624	1.42	0.19	0.21	0.12	0.84	56.00
1-Ton Truck *	300	1	6	104	624	1.42	0.19	0.21	0.12	0.84	56.00
Compactors/Tampers	20	10	6	8	480	0.07	0.01	0.01	0.01	0.04	5.52
Concrete/Mortar Mixers	25	10	6	24	1,440	0.27	0.04	0.04	0.02	0.16	20.70
Trenchers	25	10	6	25	1,500	0.29	0.04	0.04	0.02	0.17	21.56
TOTAL CONSTRUCTION EMISSIONS			**(ton/year)**			**55**	**7**	**8**	**5**	**33**	**4,080**

***** Emissions from Diesel-fueled pickup and truck are based on 8 gallons/day for each unit.

APPENDIX C SHPO CONSULTATION

STATE OF NEVADA
DEPARTMENT OF CULTURAL AFFAIRS
State Historic Preservation Office
100 N. Stewart Street
Carson City, Nevada 89701
(775) 684-3448 • Fax (775) 684-3442
www.nvshpo.org

MICHAEL E. FISCHER
Department Director

RONALD M. JAMES
State Historic Preservation Officer

February 14, 2011

Matthew McMillen
Director, Environmental Compliance Division
LP-10
U.S. Department of Energy
1000 Independence Ave. S.W.
Washington, DC 20585

RE: Loan Guarantee to Fulcrum Sierra Biofuels, LLC for a Waste-to-Ethanol Facility in McCarran, Storey County (Undertaking #2011-1446).

Dear Mr. McMillen:

The Nevada State Historic Preservation Office (SHPO) reviewed the subject undertaking. The SHPO concurs with the U.S. Department of Energy's determination that the proposed undertaking will not pose an adverse effect to any historic properties.

The SHPO notes that consultation with the affected Native American representatives will be initiated. If this consultation results in the identification of properties of religious or cultural significance that could be affected by the undertaking, you must initiate additional consultation with this office concerning the National Register eligibility and possible effects of the undertaking.

If buried and previously unidentified resources are located during project activities, the SHPO recommends that all work in the vicinity cease and this office be contacted for additional consultation per 36 CFR 800.13.b.3. and NRS 383.150-383.190.

If you have any questions concerning this correspondence, please feel free to contact me at (775) 684-3443 or by e-mail at Rebecca.Palmer@nevadaculture.org.

Sincerely,

Rebecca L. Palmer

Rebecca Lynn Palmer, Deputy
State Historic Preservation Officer

Appendix D

Responses to Comments

Appendix D – Responses to Comments

Comment	Response	Action Taken
 US Department of Energy Attn: Mr. Joseph Montgomery 1000 Independence Ave. SW (Lp-10) Washington DC 20585 RE: Fulcrum Sierra Biofuels Environmental Assessment DOE/EA-1848 Dear Mr. Montgomery: I am Kres Bishop, and I am the Business Manager of Local 350 of the United Association of Plumbers and Pipefitters and HVAC Technicians. Local 350 represents the interests of hundreds of highly trained and skilled construction workers in the piping industry, who live with their families, and work throughout northern Nevada. Our work includes the construction and maintenance of facilities such as the proposed Fulcrum Sierra Biofuels project in Storey County, Nevada. Local 350 is very concerned about finding a proper balance in industrial development. We want to see vigorous economic development, along with the maximum levels of reasonable environmental protections. Our industrial consultant has informed us that the project will be on a previously disturbed site within an industrial park and is properly zoned. The conversion of garbage into fuel will not involve combustion so air emissions will be reduced. We are also informed that the project has already obtained an air permit. Currently the construction industry in Nevada is around 40-50% unemployed. A project like this would significantly help Nevada's economy out of this recession. In Summary, U.A. Local 350 supports the DOE's Decision to provide loan guarantees for the Fulcrum Project. Kres Bishop Business Manager U.A. Local 350 Mailing Address: Post Office Box 1037, Sparks, NV 89432 Street Address: 1110 Greg Street, Sparks, NV 89431 Phone 775/359-2142, Fax 775/359-2144	Thank you for your comment.	None.

Comment	Response	Action Taken
BRIAN SANDOVAL *Governor* **STATE OF NEVADA** ANDREW K. CLINGE *Director* **DEPARTMENT OF ADMINISTRATION** **209 E. Musser Street, Room 200** **Carson City, Nevada 89701-4298** **(775) 684-0222** **Fax (775) 684-0260** **budget.state.nv.us** April 25, 2011 Joseph Montgomery US Department of Energy 1000 Independence Ave. SW (LP-10) Washington, DC 20585 Re: SAI NV # **E2011-123** Reference: **DOE/EA - 1848** Project: **16MW waste-to-ethanol facility, Fulcrum Sierra Biofuels, Storey County** Dear Joseph Montgomery: Enclosed are comments from the agencies listed below regarding the above referenced document. Please address these comments or concerns in your final decision. ***Department of Transportation*** ***Department of Wildlife*** ***Division of Water Resources*** The following agencies support the above referenced document as written: ***State Historic Preservation Office*** This represents the comments provided to the State Clearinghouse regarding the referenced document, but does not purport to represent an exhaustive list of requirements that may be imposed by state agencies on this undertaking. Further, this document does not supersede existing regulatory requirements that may apply to your undertaking. If you have questions, please contact me at (775) 684-0213. Sincerely, R. Tietje Nevada State Clearinghouse	Thank you for your comments. Responses to individual comments are provided below.	None.

Appendix D – Responses to Comments

Comment	Response	Action Taken
Nevada State Clearinghouse **From:** Compton, Terri T [tcompton@dot.state.nv.us] **Sent:** Wednesday, April 20, 2011 2:02 PM **To:** Nevada State Clearinghouse **Subject:** RE: E2011-123 16MW waste-to-ethanol facility, Fulcrum Sierra Biofuels, Storey County - Please see NDOT's remarks in the comment section. Thanks, Terri AGENCY COMMENTS: For any work within the state right-of-way, a temporary and/or permanent encroachment permit will be required. Thank you. Thor. NEVADA DOT **Thor A. Dyson, P.E., CPM** **District II Engineer** 310 Galletti Way Sparks, Nevada 89431 (775) 834-8300 - phone (775) 834-8390 - fax	Thank you for your comment. All construction activity associated with the Sierra BioFuels project will be conducted on private lands within the Tahoe-Reno Industrial Center. No work will occur within a state right-of-way.	None.

Comment	Response	Action Taken
STATE OF NEVADA **DEPARTMENT OF WILDLIFE** 1100 Valley Road Reno, Nevada 89512 (775) 688-1500 • Fax (775) 688-1595 BRIAN SANDOVAL *Governor* KENNETH E. MAYER *Director* RICHARD L. HASKINS, II *Deputy Director* PATRICK O. CATES *Deputy Director* April 21, 2011 U.S. Department of Energy Loan Guarantee Program Office Washington, D.C. 20585 Subject: 16MW waste-to-ethanol facility, Fulcrum Sierra Biofuels, Storey County To whom it may concern; The Nevada Department of Wildlife (NDOW) is supportive of the development of increasing energy efficiencies, such as in the waste-to-ethanol, Falcrum Sierra Biofuels proposed project. NDOW's goal and responsibility is to identify potential impacts to wildlife prior to project implementation and to suggest mitigation measures to avoid and lessen impacts to wildlife. During our review of this project proposal, we have identified proposed measures to minimize and mitigate impacts to wildlife. **1** NDOW encourages construction activities to occur outside the migratory bird nesting season (March 15 – July 31) within currently intact habitat. Limiting construction activities during this time will reduce the potential for taking of a migratory bird species. As such, we recommend stating in table 1.1 that protective measures include "limiting habitat removal (i.e. ground disturbing activities) during the migratory bird nesting season". If ground disturbing activities must occur during this time frame, we request that appropriate surveys are conducted by a qualified biologist. If a migratory bird nest is discovered, please contact the United States Fish and Wildlife Service for direction. **2** NDOW is supportive of the facilities processed wastewater treatment program. Additionally, we support the odor, vector, and noise control methods that are being proposed. We encourage discussion with the proponent on how to resolve wildlife attractive nuisance issues if it is determined that the above mentioned methods have failed. Furthermore, we encourage a wildlife mortality monitoring program be implemented to guide adaptive management techniques that reduce wildlife mortalities. NDOW encourages that wildlife mortalities associated with the construction and operation of the biofuels facility be reported to NDOW on an annual basis. **3** NDOW encourages that a noxious and invasive species plan be developed and implemented to prevent the introduction and spread of undesirable species into adjacent habitat. Such a plan should include prevention measures, inventory, monitoring, and treatment. Noxious and invasive species plans ensure wildlife compatibility with new development by protecting and conserving adjacent habitat. **4**	1) Thank you for your comment. 2) Section 3.8.2.1 defines the protection measure noted for migratory bird nesting as "Potential impacts to breeding birds from development activities will be minimized during construction by avoiding removal of migratory bird habitat on currently undisturbed lands on the Site to the extent possible between March 15 and July 31. Should removal of habitat be required during this period, Sierra BioFuels will coordinate with the NDOW and the USFWS to determine if surveys and appropriate mitigation, such as buffer zones around occupied nests, may be needed" (page 3-28). The text is Table 1-1 will be revised to clarify the protective measure. 3) A section regarding "Wildlife Nuisance Control" has been added to Section 2.1.4.17 (page 2-25) that includes a monitoring program and annual reporting. 4) The Facility will be constructed in an active industrial park on partially disturbed areas with disturbed properties on adjacent lands. In addition, all areas disturbed	1) None. 2) Table 1-1, page viii: Revise last sentence in Special Status Species row to "Protective measures that limit habitat removal (i.e. ground disturbing activities) during the migratory bird nesting season will be implemented." 3) Add subsection at the end of 2.1.4.17, page 2-25: "*Wildlife Nuisance Control* The Facility will work with NDOW on wildlife attraction nuisance issues if wildlife nuisance becomes an issue. Facility personnel will monitor the grounds for wildlife mortalities during construction and operation. Any wildlife mortalities would be reported to NDOW annually." 4) None.

Comment	Response	Action Taken
NDOW is concerned regarding fire ignitions as a result of construction activities. Fires have occurred on rangelands in much of northern Nevada leading to cheatgrass dominated areas. These cheatgrass dominated rangelands have reduced the quality and quantity of wildlife habitat. These areas are prone to burning and are easily ignited. NDOW recommends using the best management practices and other tools to reduce the risk of fire ignitions during construction and operation of the biofuels facility. 5 NDOW is available for further discussion regarding the waste-to-ethanol, Falcrum Sierra Biofuels proposed project. Please let us know if you have any questions, concerns, or need additional information. Sincerely,  Mark Freese Supervisory Habitat Biologist	during construction will be developed. Since no reclamation activities are planned, a noxious and invasive species plan would not be applicable to this project. 5) As noted in Table 2-3, a Fire and Life Safety Plan that is applicable to the construction and operation of the Facility will be submitted to the Storey County Fire Department (page 2-30). The Plan will consider best management practices to reduce to risk of fire ignitions during construction and operation.	5) None.

Appendix D – Responses to Comments

Comment	Response	Action Taken
Nevada State Clearinghouse **From:** Donna Lamb **Sent:** Tuesday, April 12, 2011 8:08 AM **To:** Nevada State Clearinghouse **Subject:** FW: COMPLETED: E2011-123 16MW waste-to-ethanol facility, Fulcrum Sierra Biofuels, Storey County - Good Morning, Reese. Here are Mark's comments on E2011-123. AGENCY COMMENTS: Storm water retention ponds should be constructed in accordance with best design practices. See NRS 535. In addition to capacity and dam height, location can be a factor as to whether a safety of dams permit is required. Please check with the Nevada Division of Water Resources Engineering and Dam Safety Section. Signature: //s// Mark Sivazlian, Staff Associate Engineer I Date: April 11, 2011	Thank you for your comment. Sierra BioFuels will work with the NDEP Bureau of Water Pollution Control to obtain the appropriate permits and approvals for all retention ponds constructed on site. As stated in Section 3.4.2.1, "Prior to plant start-up, the Facility will apply for a storm water permit by submitting a NOI…Site-specific BMPs will be developed once the site layout, engineering specifications, and operating procedures are finalized…The Facility's storm water drainage and management system would be designed in accordance with a grading and drainage plan approved by the Storey County Building Department" (page 3-12).	None.

Comment	Response	Action Taken
Rebecca Palmer 1/14 **From:** Nevada State Clearinghouse **Sent:** Thursday, April 07, 2011 10:02 AM **To:** Rebecca Palmer **Subject:** E2011-123 16MW waste-to-ethanol facility, Fulcrum Sierra Biofuels, Storey County - 2011-1446 **NEVADA STATE CLEARINGHOUSE** Department of Administration, Budget and Planning Division 209 East Musser Street, Room 200, Carson City, Nevada 89701-4298 (775) 684-0213 Fax (775) 684-0260 TRANSMISSION DATE: 4/7/2011 State Historic Preservation Office **Nevada SAI # E2011-123** **Project: 16MW waste-to-ethanol facility, Fulcrum Sierra Biofuels, Storey County** ____No comment on this project _✓_Proposal supported as written AGENCY COMMENTS: Signature: Rebecca Palmer 4/15/11 1	Thank you for your comment.	None.