

A one-story, slab-on-grade steel framed control building approximately 50 by 120 feet would be constructed along the eastern portion of the expansion site. The transformer, capacitor banks, and cooling equipment would be supported on about 200 individual concrete spread foundations.

Construction of the substation expansion would require approximately six feet of fill over the entire area, or approximately 50-55 thousand cubic yards of fill. Construction of the access road would require approximately 20-25 thousand cubic yards of fill. Concrete footings and foundations would require approximately 1800-2000 cubic yards of concrete.

Site grading and foundation work would begin in August, 1992, and continue over a six-month period. During that period, the average number of fill trucks per day would range between 150 and 200. Approximately eight to ten trucks per day would deliver concrete to the site. The total workforce for the fill operation would range from ten to twenty, with as many as thirty drivers required during some periods.

Construction of steel structures, installation of electrical equipment, and testing of equipment would occur concurrently over a ten to eleven month period. These activities would require a workforce ranging between 15 and 45 people at the site, depending on the work phase. The workforce would be composed of skilled and unskilled laborers, electricians, and electrical technicians.

The estimated cost of the expansion of the Forbes substation is \$20,000,000. Because this would be a turnkey contract, it is not known how much of this amount would be used for local construction activities. However, NSP engineers indicate that the equipment to be installed at Forbes substation is expensive and would account for most of the budget.

2.1.2 Operations

The Forbes substation would not require a permanent operational staff. Operations would be monitored by computer on a continuous basis. Occasional on-site inspections of equipment would be conducted.

3.0 THE AFFECTED ENVIRONMENT

3.1 Topography and Soils

The area in the vicinity of the substation is relatively flat, with some gently rolling hills. The substation is located on a slight elevation (1350 ft. above mean sea level). The land slopes down on all sides from the substation. Within a quarter of a mile, elevation is 1320 ft. Within a mile, the elevation is approximately 1300 ft. There are several small lakes in the vicinity of the site. The West Two river, a small stream, flows southeast into the St. Louis River. The West Two River passes about a half mile from the site, and the St. Louis River is approximately two miles away.

The proposed expansion site is currently intersected by two constructed drainage ditches which carry runoff water from the existing substation. One of these ditches runs along and parallel with the west side of the existing substation. The other begins approximately 400 feet from the southwest corner of the substation, and runs northwest for a distance of approximately 500 feet (see Figure 3). Both drainage systems empty into the cleared right-of-way underneath the 500 kV line. Soil borings taken at the site show black topsoil six inches to one foot deep over most of the site (Braun Intertec, 1992). Underlying the topsoil is a three to seven foot layer of fine grained silty sand.

3.2 Terrestrial and Aquatic Ecology

The terrestrial ecology of the Forbes Substation is characteristic of northern Minnesota. The dominant habitat types on this site are agricultural and woodlands. The various types of plant communities associated with this site are provided in Figure 4.

This type of habitat is capable of supporting a variety of upland birds and mammals. In general, bird species that may be found on this site include (but are not limited to) the following:

Goshawk	Evening grosbeak
Merlin	Purple finch
Philadelphia vireo	Pine siskin
Warblers	Crossbills
Barred owl*	Grouse
Black-backed three-toed woodpecker	Sparrows*
Northern three-toed woodpecker	Chickadees*
Olive-sided flycatcher	Winter wren
Common raven*	Swainson's thrush
Red-breasted nuthatch	

Additionally, various waterfowl and birds-of-prey may be present during migratory periods.

Mammals that may be present on-site include, but are not limited to the following:

White-tailed deer	Raccoon
Gray squirrel	Opossum
Cottontail rabbits	Skunk
Fox	Snowshoe Hare
Porcupine	

Finally, there is no aquatic habitat on the site.

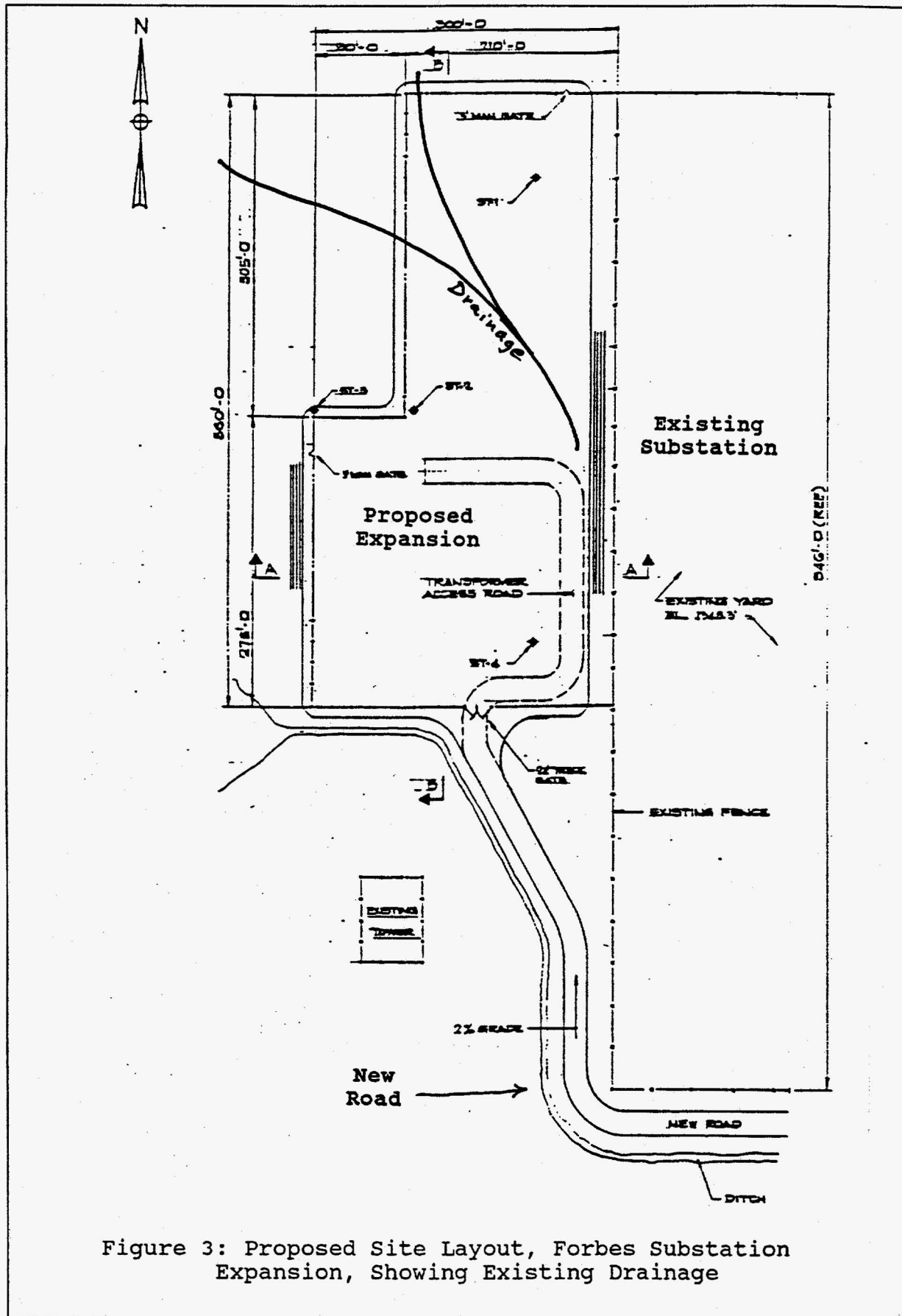


Figure 3: Proposed Site Layout, Forbes Substation Expansion, Showing Existing Drainage

Figure 4: Plant Communities, Forbes Substation

Community Type	Dominant Species	Typical Associated Species*
Crop and pasture	agricultural crops and pasture species	Common weedy forbs and grasses.*
Shrub associations	willows, alders	Black ash, black spruce, tamarack, creeping snowberry sphagnum, starflower, gold-thread, twinflower, bunchberry, white cedar, bog birch, bog rosemary, bladderwort, sedges, pitcher plant, cottongrass, bluegrass,* Labrador tea,* reindeer moss.
Pine forest	white pine red pine jack pine	White spruce, balsam fir, white cedar, paper birch, quaking aspen red maple, northern pin oak, beaked hazel, fly honeysuckle, mountain maple, wintergreen, blueberry, juneberry, sweet fern, sarsaparilla, feather mosses, bedstraw, Canada mayflower.
Northern hardwood or mixed hardwood-pine	sugar maple American basswood	Red maple, red oak, American elm, black ash, bur oak, paper birch, balsam fir, white pine,* beaked hazel, mountain maple, red berried elder, Canada mayflower, sarsaparilla, twisted stalk, trillium.

Figure 4 (Continued): Plant Communities, Forbes Substation

Community Type	Dominant Species	Typical Associated Species*
Spruce-Fir	white spruce bassam fir	White and red pine,* white cedar, paper birch, quaking aspen, mountain ash, balsam poplar, beaked hazel, bush honeysuckle, speckled alder, mountain maple, dewberry, bishop's cap, raspberry,* blueberry, bunchberry, bedstraw, clintonia, large leaved aster, goldthread, starflower, sarsaparilla, Canada mayflower.

* Observed at the site. Other species are those typically occurring local in plant communities (DOE, 1979).

3.3 Wetlands/Floodplains

There are no wetlands associated with the site. However, there are wetlands in the general vicinity. The nearest one, according to the U.S. Geological Survey Map (USGS, 1969), is approximately one-half mile away on the other side of County Road 661.

Discussions with St. Louis County planning officials indicate that the Forbes site is not located in a 100-year floodplain.

3.4 Threatened or Endangered Species

There are no Federal or State threatened or endangered species recorded in the vicinity of this site.

3.5 Land Use

The southern portion of St. Louis County contains Minnesota's iron range. Low-grade iron ore is mined from open pit mines and processed into taconite. There are some open pit mines within a few miles of the site. St. Louis County also contains agricultural and forest land. Farms are typically smaller than in the more productive parts of the state. Forested land may be logged.

In the immediate vicinity of the site, land use is of three major types. The small town of Forbes contains a small number of residential and commercial structures. Within a mile of the site are small farms. Much of the land in the vicinity is either open land not currently used for farming, or forested with mixed hardwoods and pines. The site itself is bordered on all sides by forested land.

The existing substation and the site of the proposed expansion are both owned by Minnesota Power. Construction of the expansion on the proposed site would not require the acquisition of any additional property.

3.6 Socioeconomics

3.6.1 Population and Housing

The total population figure for St. Louis County was 198,213 in 1990 (see Table 1). The major population centers in the county are in the southern end. Duluth, approximately 40 miles away, had a population of 85,493 in 1990. Closer to the site are the cities of Virginia (population 9,150), Eveleth (4,420), Hibbing (19,030), and Cloquet (10,520). Forbes, approximately three miles from the site, has an estimated population of 50.

Of the 95,403 housing units in the county in 1990, 16,502 remained vacant.

**Table 1: Population and Housing
For St. Louis County*
1990**

Total Population	198,213
Housing Units	95,403
Vacant Units	16,502

***Source: Minnesota Department of Jobs and Training 1991b.**

3.6.2 Employment and Income

The services, trade, and government sectors were the leading sectors of employment in St. Louis County in 1990 and 1991 (see Table 2). Mining, manufacturing, transportation, and construction also account for substantial portions of total employment in the county.

The size of the labor force in St. Louis County fluctuated during the 1980's, decreasing from 101,998 in 1980 to a low of 89,343 in 1985, and eventually re-expanding to 93,812 in 1990 (see Table 3). In 1991, the size of the labor force remained stable. In 1990, employment countywide was 88,226, with 38,302 persons employed in the Duluth area. Total employment in the county and the Duluth area decreased in 1991, as Table 3 shows. While unemployment had decreased in the 1980s, the total number of unemployed increased throughout the county and in the Duluth area between 1990 and 1991 (see Table 3). In particular, there was a decline of employment in the construction industry of about 6 percent (see Table 2).

3.7 Transportation and Traffic

Access to the Forbes substation is gained from St. Louis County Roads 661 and 16, both of which are two-lane paved highways. County Road 16 connects to State Highway 37 and U. S. Highway 53. These are the routes that are most likely to be used by workers commuting from nearby towns, and by the trucks bringing gravel backfill, concrete, and steel equipment to the site. A 1987 survey of traffic along county roads shows 215 vehicles per day at the intersection of Highways 16 and 661 (Minnesota Department of Transportation, 1987). Along Highway 37, the average number of vehicles ranges from 2,400 to 2,800 per day. Along Highway 53, the average number of vehicles ranges from 6,500 to 10,600 per day.

3.8 Noise

The primary man-made noise sources at the Forbes Substation include transmission line "hum" and occasional traffic from County Roads 16 and 661.

3.9 Cultural Resources

Cultural resources for the general region are described in Section 3.2.9 of the Final Environmental Assessment for the Amendment to Presidential Permit PP-63. No known cultural resources exist at the site.

Table 2: Employment and Income by
Industrial Sector, Fourth Quarter,
1990 and Second Quarter 1991 *

Sector	Units	Average Employment	Total Wages
Agriculture			
1990	49	313	1,282,002
1991	50	354	1,189,717
Mining			
1990	23	5,366	48,518,541
1991	22	5,365	54,296,279
Construction			
1990	424	3,296	24,455,426
1991	425	3,089	22,370,759
Manufacturing			
1990	267	6,970	40,100,963
1991	273	6,788	38,619,850
Transportation and Utilities			
1990	229	4,078	28,873,406
1991	228	3,949	28,144,465
Trade			
1990	1,724	20,055	68,397,142
1991	1,739	20,353	64,727,676
Finance, Insurance and Real Estate			
1990	399	2,807	14,752,246
1991	406	2,958	15,018,941
Services			
1990	1,645	20,762	100,541,598
1991	1,639	21,417	100,828,961
Government			
1990	389	17,630	101,482,776
1991	390	17,168	114,380,869
Total, All Industries			
1990	5,149	81,277	428,404,100

*Source: Minnesota Department of Jobs and Training (1991a; 1992)

Table 3: Labor Force and Unemployment
St. Louis County 1990 and 1991*

Area and Year	Labor Force	Employment	Unemployment
Total			
1990	93,812	88,226	5,586
1991	93,901	86,283	7,618
Duluth Area			
1990	40,400	38,302	2,098
1991	40,301	37,459	2,842
Balance of County			
1990	53,412	49,924	3,488
1991	53,600	48,824	4,776

*Source: Minnesota Department of Jobs and Training (1991a; 1992)

4.0 POTENTIAL IMPACTS

4.1 Topography and Soils

No impacts are expected to occur. The substation expansion and the extension of the access road will be surfaced with crushed stone, and appropriate drainage systems installed.

4.2 Terrestrial and Aquatic Ecology

The additional equipment to be placed on this site would increase the site's footprint from 30 acres to 35 acres. The addition to the present substation would require removal of approximately two to three acres of trees and shrubs. Consequently, there should be only minor impacts to the area's terrestrial plant communities.

The wildlife communities associated with this site are not expected to suffer any major adverse impacts due to the further development of this site. Displacement of several species of rodents such as field mice and cottontail rabbits may take place, however the surrounding ecosystem is substantial enough to absorb these animals.

Finally, there is no aquatic habitat on the site to be impacted.

4.3 Wetlands/Floodplains

There are neither wetlands nor floodplains associated with the site.

4.4 Threatened or Endangered Species

There are no threatened or endangered species on the Federal or State of Minnesota lists that occur in this area.

4.5 Land Use

Since the land to be used for the substation addition is entirely owned by Minnesota Power, no land use impacts would occur.

4.6 Socioeconomic Impacts

4.6.1 Population and Housing

The work force involved in construction would create a small, short-term population impact in St. Louis County during the construction period. Because the work force is small, and because the site is located near several small towns, no population impact is anticipated.

Because the substation does not require a permanent operational work force, no long-term impacts would occur.

4.6.2 Employment and Income

Some positive impacts would occur during the construction phase. Since the land is already utility-owned, no long-term tax revenue impact is anticipated.

4.7 Transportation and Traffic

During construction, the number of vehicles carrying backfill and concrete may nearly equal total current traffic levels, but would remain below rated carrying capacity for two-lane paved roads.

4.8 Noise Impacts

Construction noise generated by machinery would constitute the primary noise impact. No long-term noise impacts would occur.

4.9 Cultural Resources

Because no known archeological sites are located within the area of the substation expansion, it is not anticipated that cultural resources impacts would occur.

4.10 Air Quality

Short-term impacts (fugitive dust) at the site would result from construction activities. No long-term impacts would occur.

4.11 Electrical and Magnetic Fields (EMF)

It is not anticipated that construction of an expansion to the west side of the Forbes substation would result in a significant change in electrical or magnetic fields. In general, the range and pattern of measurements documented in the **Final Environmental Assessment** and the distance to the nearest residence (one quarter mile) suggest that the potential for continuous human exposure to magnetic fields resulting from the proposed action would be minimal.

The **Final Environmental Assessment** noted that, "Because of our limited knowledge of the exposure parameters involved and the non-linearity of the dose/effect relationship, there is currently no scientific basis for regulatory action (DOE, 1992)." The limited potential for continuous human exposure at Forbes substation reinforces this perspective with respect to the proposed action evaluated in this Addendum. For the same reasons, an extensive program of mitigation is not warranted at this time.

5.0 MITIGATION MEASURES

Because implementation of the Proposed Action is not expected to cause any significant adverse impacts, few mitigation measures are warranted.

However, there are two areas of concern that should be taken into account in NSP's planning and implementation. They are:

- Control of runoff during construction and operation. As noted in the construction specifications (Asea Brown Boveri, 1992) the proposed work includes construction of appropriate drainage to control runoff and minimize erosion potential.
- Cultural resources. No cultural resource impacts are anticipated. NSP should provide properly trained site supervisors so that, if artifacts are discovered, appropriate mitigation measures can be implemented.

6.0 COMMITMENTS OF RESOURCES, SHORT-AND LONG TERM PRODUCTIVITY, AND CUMULATIVE IMPACTS

This chapter describes the irreversible and irretrievable commitments of resources, the relationship between short-term use of the land and long-term productivity, and cumulative and indirect impacts that would result from implementation of the proposed action.

6.1 Irreversible and Irretrievable Commitments of Resources

Implementation of the Proposed Action would not result in the removal of any cultivated farmland from production. Approximately 5 acres of wooded land would be used for the substation expansion.

6.2 Relationship Between Short-term Use and Long-Term Productivity

Wooded land to be used for the substation does not currently have any economic use.

6.3 Cumulative Impacts

As noted throughout Section 4.0, the Proposed Action does not appear to have significant adverse environmental impacts. Pursuant to NEPA and to 40 CFR 1500-1508, the cumulative impacts of the Proposed Action must also be addressed.

The proposed modifications at the Forbes site would occur in a predominantly rural setting. At this time, no other development projects are known to be planned in the vicinity of this site. It appears reasonable to conclude that construction activities associated with this site would not bring with them significant adverse cumulative impacts either in terms of the natural environment or in terms of the human environment.

7.0 REFERENCES

Asea Brown Boveri, 1992. Construction Specifications for the Proposed Substation Addition at Forbes, Minnesota.

Braun Intertec, 1992. Geotechnical Evaluation for Superior Engineering Corporation. Proposed Minnesota Power Substation Addition. West of Forbes, Minnesota.

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