

CHAPTER 6
LONG- AND SHORT-TERM
ENVIRONMENTAL USES

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6. The Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

6.1 Coal

The proposed coal gasification facility would require about 270,000 tons of lignite per week or about 351 million tons over the projected 25-year life of the plant. About 200,000 tons/week are used for direct conversion to SNG; the remainder would be burned in the Basin Electric powerplant. This coal consumption would be a short-term use of resources in that it could not be reconstituted or used for any alternative process. This short-term use of the resource must be related to its long-term value if not used at the present time. The short-term benefit of the use of the coal now would be the production of 250 MMcf/day of natural gas -- for a period of at least 25 years. For the 25-year period this would amount to 2.28 Tcf of gas, or more than 2 quadrillion Btu's of energy. This is equivalent to 377 million barrels of oil.

The long-term benefits of not using the coal are: (1) it avoids the environmental and social impacts that would be associated with the construction and operation of the plant, and (2) it preserves the coal as a resource that could be developed at some future date. Future development has the potential advantage that new technologies could be developed with higher conversion efficiencies.

6.2 Water

The use of 17,000 acre-feet of water annually would constitute the temporary use of a resource. Only about 15 percent, or about 2,550 acre-feet, is actually consumed annually; the remainder would be returned to the natural hydrologic cycle as water vapor. The use of the water would not reduce the world supply, but would preclude its use in the Missouri River Basin during the life of the plant, such as for the generation of about 8 million kilowatt-hours (1 MW) of hydroelectric power annually. Upon termination of the water service contract, the water would become available for irrigation or industrial uses depending upon the laws and regulations in effect at the time.

Mining activities would destroy a lignite aquifer in the area with a possible resultant water level drop in wells adjacent to the mine. The aquifer cannot be restored; thus, the short-term use of the coal would preempt the long-term use of water from the aquifer for rural agricultural purposes.

Over 16 million tons of ash would be deposited in the mined-out area and some leaching into nearby aquifers could possibly occur. If such leaching did occur, the use of water from affected aquifers for domestic purposes would also be preempted for the foreseeable future.

6.3 Oxygen

Large quantities of oxygen would be consumed in producing gas, operating various support systems, and burning the SNG in the service area. The use of the oxygen is short-term and most of it would likely be recycled from CO₂ to oxygen by natural processes and returned to atmosphere.

6.4 Atmosphere

The atmosphere would be the source of oxygen used in producing the SNG and burning it in the service area, and a sink for deposition of emissions from both processes. As a receptacle for emissions, the atmosphere would receive varying quantities of CO₂ water vapor, SO₂, NO₂, trace metals, and particulates. Except for CO₂, which should eventually be recycled by photosynthesis, these emissions are expected to oxidize or combine with water and settle to earth. The emissions would cause a short-term local deterioration of atmospheric quality but should not preempt its long-term use. However, the long-term effects of large quantities of emissions on the atmosphere are not well understood.

6.5 Land

About 14,000 acres of land would be disturbed by the proposed project. The use of the land is short-term, but even with successful reclamation there would be long-term changes in land use. Approximately 5,200 acres of natural prairie, 97 acres of natural wetland, and 46 acres of natural woodland would be lost. Much of the prairie would be converted to agricultural use; thus, only a small fraction would ever return to seminatural prairie, even in the long-term. There would also be a long-term disruption of soil structure of the mine area. Whether or not there would be an associated long-term impact on soil productivity would depend on reclamation success.

6.6 Economic and Social Aspects

The economic aspects of construction and operation of the gasification facility would be local and short-term. The impacts on social aspects could be longer lasting. The population increase in an essentially rural area for a period of at least 25 years could leave permanent changes in the existing social environment, even

after termination of the plant and the outmigration of persons associated with it. Whether or not these changes are adverse depends on the ability and desire of local citizenry and institutions to adapt to changes of these magnitudes.

6.7 Biota

Some adverse impacts would occur to the flora and fauna on the land used for the gasification plant and mine. What the long-term impacts would be cannot be precisely predicted because they would depend on how the land is reclaimed. Current trends in reclamation in North Dakota are to restore the land to agricultural uses, thus there would be a long-term loss of native prairie and wetland plant communities and the obligate wildlife associated with these communities. Animals and plants associated with agricultural areas would likely increase proportionately. The long-term effect on plants and animals associated with wetlands and woodlands would depend on the acreage of these habitat types established during reclamation, and that is not known at this time.

6.8 Cultural Resources

Some archaeological and historical sites may be destroyed on the land used for the gasification plant, mine, and associated facilities. Although these sites would be salvaged, some information would be lost that might be obtained by advanced techniques yet to be developed.

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