minnesota department of natural resources

final environmental impact statement

proposed inland steel taconite operation · st. louis county · minnesota

march 22, 1974

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

FINAL ENVIRONMENTAL IMPACT STATEMENT

Proposed Taconite Operation by Inland Steel
in St. Louis County, Minnesota

March 22, 1974

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IN ST. LOUIS COUNTY, MINNESOTA

I. DESCRIPTION OF ACTION

The proposed project involves the development of two large open pit mines in the Biwabik Iron Formation northerly and northeasterly of the City of Virginia in St. Louis County, Minnesota, for the production of crude magnetite taconite ores. The ores so produced would be crushed, concentrated and agglomerated in on-site facilities to yield high-grade oxide pellets for shipment to the Indiana Harbor Works at East Chicago, Indiana. This steel plant, the third largest in the Nation, obtains its raw materials for steel production from Inland Steel's wholly or jointly-owned sources in the States of Michigan, Wisconsin and Minnesota and in the Canadian Provinces of Ontario and Newfoundland. The taconite operation proposed for the Virginia area is deemed to be a suitable and desirable replacement for Inland's largest present source of ore, the Caland Ore Company Limited's operation in Ontario--the reserves of which will be economically exhausted by 1978.

The beneficial effect on area economy through construction and operation of a taconite facility has been clearly demonstrated by prior installations on the Mesabi Range. The proposed operation, like those of its predecessors, would require the expenditure of millions of dollars for facilities and, during construction period, would provide employment for scores of skilled and semi-skilled workmen in a variety of crafts. Upon completion of the facilities and initiation of operations at the anticipated production levels, a staff of about 500 people would be gainfully employed on a year-around basis with continuing opportunities for improvement of skills and betterment of jobs or positions. In addition, the constant demand for supplies and service essential for production would provide work and profit for the satellite industries--many

of which are located on the Mesabi Range or elsewhere in Minnesota.

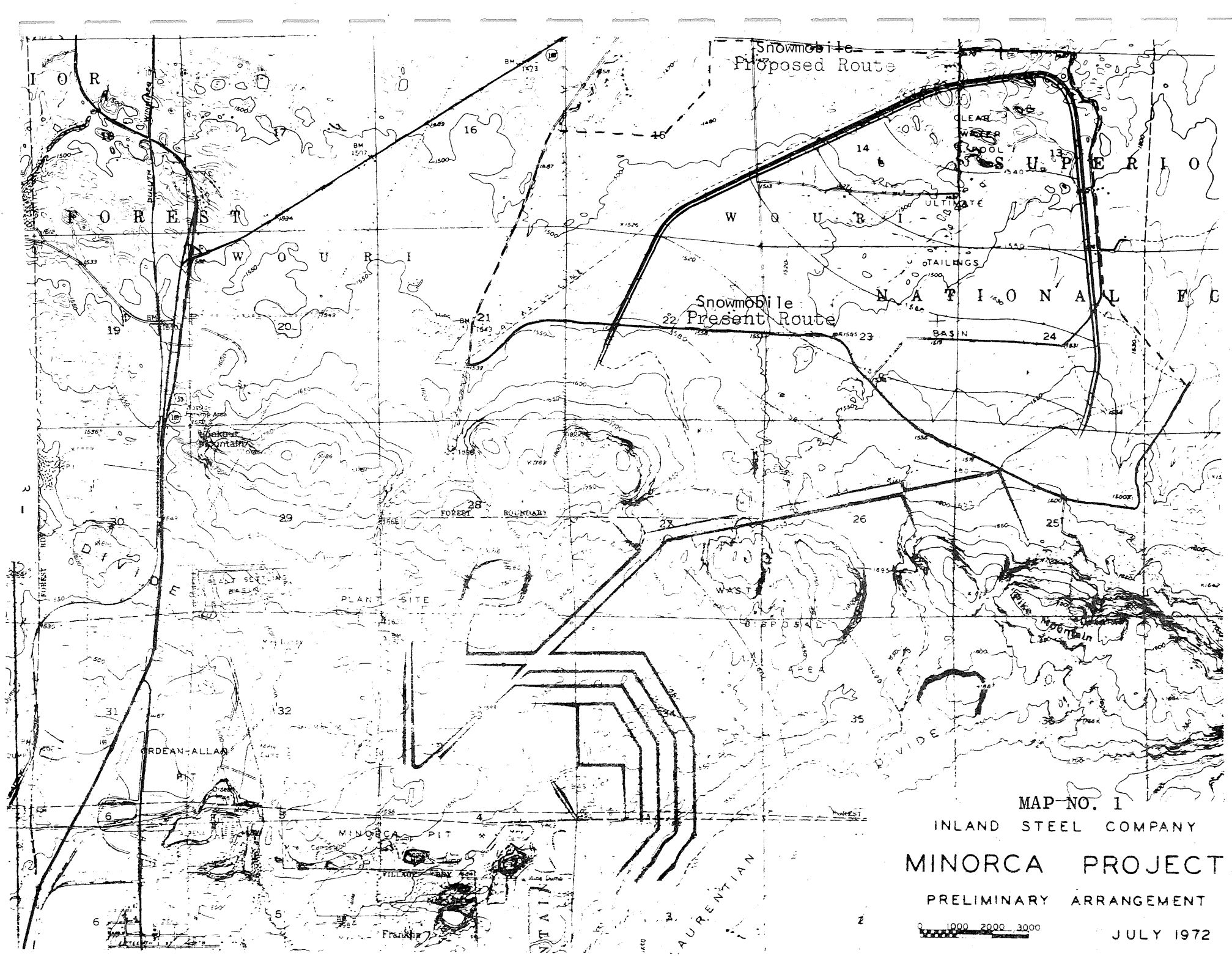
However, installation and operation of the proposed facilities will bring about changes in the environmental setting both within and proximate to the specific areas of involvement. In recognition thereof, every effort has been made in planning for that operation to minimize or eliminate possible adverse effects and to maximize the beneficial aspects of the necessary changes in the setting as is described or defined as follows. The proponent of the action is:

Inland Steel Company
P. O. Box 100
Ishpeming, Michigan 49849

A. OBJECTIVE OF ACTION

Inland Steel's control of minerals in the Biwabik Iron Formation north and east of the City of Virginia is through mining lease of a block of lands containing approximately 1,800 acres of which about 260 acres are owned in fee by the State of Minnesota. Exploration by diamond drill and subsequent laboratory testing of drill core indicates that these lands might contain as much as 280 million gross tons of minable magnetite taconite that, upon benefication, would yield about 80 million gross tons of pellets of merchantable quality. Inland anticipates that this reserve of crude taconite would be made available by development of the "Ordean-Allan" and "Minorca" open pits within the ultimate limits depicted on Map 1.

The tentative plan for development of the reserve is that mining operations would be initiated in the Minorca Pit and continue through to its depletion with the Ordean-Allan Pit being brought into production only when its crude ore would be needed to augment that available from the waning reserve in the Minorca to meet daily plant requirements. Operations in both pits would be by use of accepted techniques using conventional open pit mining equipment.



MAP NO. 1

INLAND STEEL COMPANY

MINORCA PROJECT

PRELIMINARY ARRANGEMENT

0 1000 2000 3000

JULY 1972

Overburden and waste rock from the mining operation would be trucked over well maintained haul roads to the waste disposal area for controlled deposition in stockpile while the crude ore would be hauled to the truck dump pockets in the crushing plant on the plant site for beneficiation by crushing, grinding, concentration and agglomeration to produce pellets for shipment via unit trains of a common-carrier railroad.

Concentration of the crude ore would also produce a plant waste, called "tailings", which would be separated into two size fractions for disposal. The coarse fraction would be dewatered at the plant and truck hauled to either the waste disposal area for deposition in stockpile or to the site of its use for the other purposes, such as stemming for blasting, road surfacing, tailings dam construction and highway construction aggregate. The fine fraction of the tailings, mixed with water to form a slurry, would be pumped to a tailings basin for settlement of the tailings and release and clarification of the water.

Waters so released would be returned to the plant for reuse as process water along with any new waters entrapped by and impounded within the tailings basin. These new waters from surface runoff within the watershed area of the basin and that reclaimable from fine tailings deposition, to the extent that they exceed the losses from the basin through evaporation and seepage, would be the primary source of water to meet plant requirements.

2. DESCRIPTION OF THE ENVIRONMENTAL SETTING

1. SOCIO-ECONOMIC SETTING

The area affected by the proposed project is widespread because of many factors which are unique in this northeastern portion of the state. Major taconite plant construction or expansion constitutes development of regional significance. The impact of existing taconite and other mining operations extend throughout a major portion of the Arrowhead Region.

The area directly affected is a linear strip of contiguous semi-urbanized development known as the Iron Range community or sub-region. "The Iron Range sub-region, dividing St. Louis County at its midpoint, is a chain of cities and villages which follows the snake-like pattern of the Mesabi Range. As people are willing to commute to work up to 40 miles, the direct economic influence of the Range extends a considerable distance from the area of the mines. Though the Vermillion Range is now completely inactive in actual mining, many workers from Ely, Tower and Soudan areas are employed on the Mesabi Range. Many workers also have rural homes a considerable distance from their work."[1]

The 1969 pattern of urban service and activity centers shows some 48 settlements with a total population of about 110,000 persons or about the size of the City of Duluth. Current Iron Range Region population, including farm and rural non-farm housing, is estimated to be 118,000 as compared to the 1960 Census total of 120,185. This is a very low population when it is realized that the Range is approximately 100 miles long and encompasses 2,750 square miles. Overall density is only 43 persons per square mile.

The decline in population is consistent with the trend throughout the entire Lake Superior Basin which has shown a 4.1 percent decrease from 1960 to 1970. The population of Virginia decreased 11.3 percent while Eveleth decreased 17.5 percent during this period. There are no up-to-date population projections for 1980, but a sustained emigration for the past 20 years, in spite of new expected industrial and commercial developments in the next decade, will probably mean a stable population fluctuating $\pm$ 3 percent.

The economic stablility of the Range has improved substantially since development of the taconite industry. However, the overall area has had a gradual decline in population in recent years. The new taconite industry is more automated and not as labor-intensive as the older mining operations. A high percentage

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[1]"Land for Land Exchange Proposed by Inland Steel Company" U.S.D.A. Forest Service Draft Environmental Statement, 1973.

of young people leave the area for work in the larger cities.

Numerous efforts are being made to diversify industry in the Range area. Various types of small manufacturing plants, commercial-service industry and tourism are being promoted. Several industrial parks are in different stages of development and operation. However, with the prospects of increased transportation costs and fuel shortages, shipping to distant markets as well as tourist travel may be sharply curtailed.

The annual values of three major economic activities in the seven county Arrowhead Region during 1971 are estimated as follows:

TABLE I. MAJOR ECONOMIC ACTIVITIES IN NORTHEASTERN MINNESOTA

Mining	$640,000,000
Recreation	$320,000,000
Timber	$390,000,000

Current 1973 employment distribution by major categories in the Hibbing-Virginia Areawide Planning Jurisdiction (APJ) indicate a high proportion of commercial-service and government employment.

TABLE II. EMPLOYMENT STATISTICS

Mining and Taconite Processing	29.6%
Construction, Manufacturing and Wholesale	15.5%
Retail Trade, Service, and Finance	34.4%
Transportation, Utilities and Government	20.5%
	100.0%

Many studies and reports have been made on the economic impact of the taconite mining, the tremendous investments involved, the amount of employment, and the satellite industries that have been developed. There is little question that the taconite industry is of great importance to this area.

Taconite mining development is an expensive proposition as is indicated by the fact that over one-billion dollars have been invested to date in the Mesabi Range taconite plants. Because more highly skilled workers are needed and the average wage for this industry is high, employment is secure. In 1973 there were 12,335 people directly employed by the taconite mining industry. Inland Steel Company's proposed facility, a 2.3 million ton per year plant, is expected to involve an investment of in excess of $70,000,000, and provide employment for about 450 people.

The natural ore industry still employs a considerable number of people on the Mesabi Range, but these operations are expected to be phased out completely within the next 20 years. To maintain the economy of the area, these jobs will have to be replaced and the best chance of replacement is from expansion of the taconite industry.

The steel companies decisions to develop or expand their ore sources are based on many and complex factors. In 1964, a Minnesota Constitutional Amendment was passed insuring that the taconite industry would not be taxed inequitably compared with other industries. This was a major factor favorable to the present extensive development on the Mesabi Iron Range. An increase in taxes above the rates in other areas would be a factor against expansion in this area. Low prices for foreign ores must be balanced against possible unreliability of the supplies.

The tonnage of iron ores imported from foreign countries has been rising rapidly in recent years. Ores from as far as Australia can be priced competitively at the steel mills. The unfavorable balance of payments is a serious problem to the national economy. Development of domestic sources of iron ore would help in reducing this problem.

2. Physical Characteristics of Area

The area affected by the taconite mining proposals generally parallels the Laurentian Continental Divide, with the Giant's Ridge forming the divide between Hibbing and Biwabik. Just north of Hibbing is a triple watershed; west and south the Mississippi Watershed, south and east the St. Louis River into the Great Lakes Watershed and north to the Rainy River and Hudson Bay Watershed. Between Biwabik and Aurora, the Embarrass River, a tributary of the St. Louis River, cuts the Giant's Ridge and the Continental Divide bends to the north, then loops south again across the Iron Range near Babbitt. The most prominent portions of the Giant's Ridge rise fairly sharply to 400-450 feet above the bordering plains with Lookout and Pike Mountains north of Virginia reaching elevations of 1,851 and 1,930 feet above sea level. Generally, the topography varies from level to gently rolling and hilly.

Physiography of this region is the result of glaciation. It is an area of morainic deposits and outwash plains. During one of the last periods of glaciation an ice lobe overrode the Giant's Ridge and is responsible for much of the present basic land forms. Soils are varied, ranging from sands to very poorly drained clays, and from organic bog soils to areas of rock outcrop. Some areas are extremely rocky and bouldery, especially along the top of the Continental Divide. Along the Mesabi Range in St. Louis County, lakes are few and scattered as compared with much of the area of the Superior National Forest. Because of the Range's position on the Continental Divide, streams are generally small.

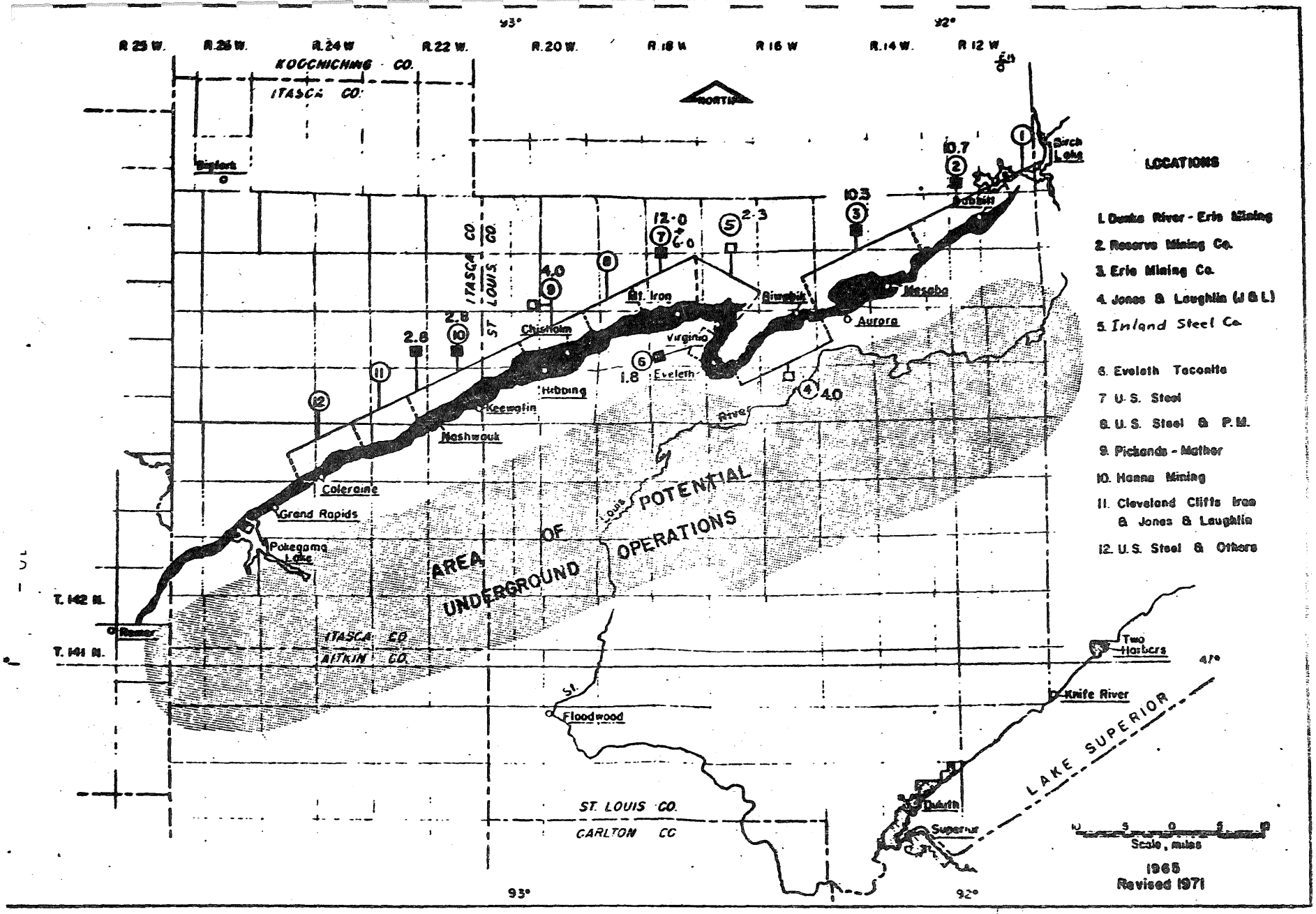
The entire area was almost entirely forested, with the original forest having considerable stands of large red and white pine. Logging and extensive fires have resulted in the present day forests being almost entirely second growth, predominantly aspen and birch with considerable areas of jack pine and other conifers. Almost all the timber is pulpwood size or less. The Minnesota Soil

Atlas, Hibbing sheet, shows the Mesabi Range geomorphic region as now having 45 to 50 percent forest, 40 to 50 percent mines and dumps, 5 to 10 percent pasture and meadow, and 4 to 6 percent urban area. The delineation of the Mesabi Range in this Atlas is somewhat different from what is often understood to be the Range. For example, the line is north of several Range towns and the region is shown extending north of the Giant's Ridge into the granite area. However, this does illustrate the general distribution of land use and the extent of the area disturbed by mining.

3. Geology

The iron formations in Minnesota occur in three areas. The Cuyuna Range is located in Aitkin and Crow Wing Counties near Aitkin and Brainerd. This area is considerably to the south and west and has little effect on the area. The Vermillion Range, located in St. Louis County between Tower and Ely, is currently completely inactive. The Mesabi Iron Range, about 110 miles long and 1 to 3 miles wide, runs in a northeast-southwest direction across St. Louis County from Babbitt to Hibbing and continues into Itasca County near Grand Rapids. (Map 2)

Just south of Giant's Ridge eastward to Birch Lake, is the iron bearing outcrop called the Biwabik Formation of the Mesabi Iron Range shown in Figure I. The width of exposure at ledge averages about 1¼ miles but in places is as great as 3 miles and in others as little as ¼ of a mile. The total area of the outcrop is approximately 135 square miles. From the north limit of the outcrop area at the boundary formed by exposure of the underlying Pokegama quartzite, the formation slopes gently to the south at a dip of from 5 to 10 degrees from the horizontal. The south limit of the outcrop area is formed by the north limit of the overlying Virginia slate except near the eastern end of the Range where a great intrusion of dark colored gabbro (called the Duluth Gabbro)



MAP 7

TACONITE OPERATIONS - MESABI RANGE - CURRENT & POTENTIAL

LEGEND: ■ Plants in Operation ☑ Plants under Construction □ Plants in Design Stage

[6.0 represents plant capacity in million tons annually
+6.0 represents plant expansion in million tons annually]

FIGURE I

lapped up over the iron formation and pinched it off at the eastern extremity - heavily affecting the iron formation by its cooking action in the process. On the western end the formation gradually thins out to the point where the overlying slate and underlying quartzite come together.

The sedimentary rocks of the iron formation are called taconite. The essential minerals in the order of their abundance are quartz (or chert), silicates, magnetite, siderite and other carbonates, and hematite, which are combined in all conceivable proportions. Depending on those proportions, the taconites could be and are called cherty taconite, silicate taconite, carbonate taconite, magnetic taconite, jaspery and hematitic taconites, banded and slaty taconites and slates. Where oxidized and exposed to the action of penetrating surface waters which leached out the silica and left the iron concentrated in place, the taconites have been altered to the magnetite and hematite-limonite ore deposits of the Mesabi Range. These deposits, which occur like "raisins in a cake" for a 70 to 80 mile length of the Range have yielded nearly three billion tons of so-called natural ore for the nation's iron and steel making furnaces. The mining operations that produced this ore over the past 80-plus years have served to deplete the natural ore in most of the deposits and much of what remains cannot compete in the iron ore market with the high grade oxide pellet that is being commercially produced from those unaltered taconites that contain a relatively high percentage of magnetite.

The great bulk of the Mesabi Range remains as hard magnetic taconite, and this is the ore now being processed by the new plants. Taconite ore varies in grade and composition but the ore currently being mined contains about 31 percent total iron of which 65 to 70 percent is the magnetic mineral magnetite. Most of the ore comes from the two cherty layers of the Biwabik formation, as the slatey layers contain iron in such fine particles that it cannot be commercially separated. The cherty taconite is a very hard rock that has a

streaked or banded appearance, the dark grey bands being the magnetite and the lighter bands mostly silica minerals.

Figure II illustrates the various stages of mining development on the Mesabi Iron Range.

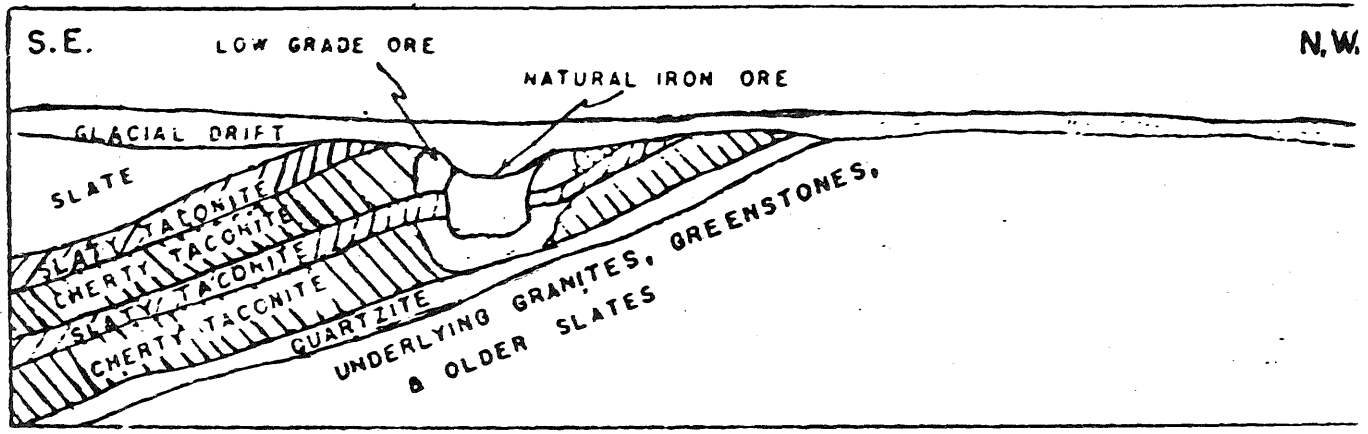
There are still natural ore operations on the Mesabi Range with 20 million tons shipped in 1970. These shipments are expected to drop to near zero within about 20 years. Since 1967 the total tonnage of taconite ore pellets has exceeded that of natural ore.

There are now six operating taconite processing plants with a capacity of 34.4 million tons per year and three new plants planned or proposed. The planned plants, plus known expansion plans for operating plants will add another 22.3 million tons per year capacity, to a total of 56.7 million tons per year.

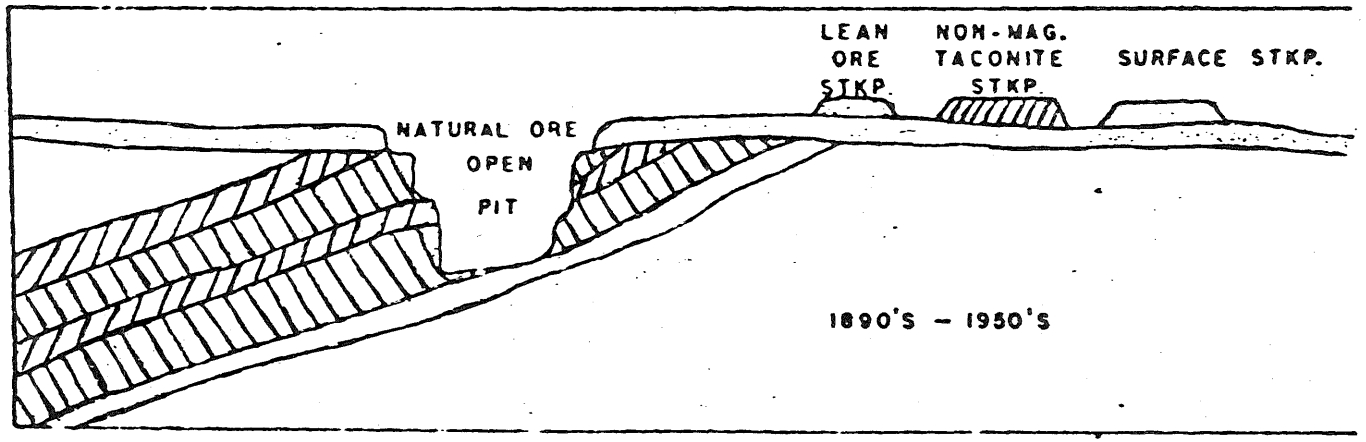
The very highest grade ores from the Mesabi Range could be shipped and used in the steel mills in their natural state, but from very early most ore was treated or "beneficiated". This was essentially a cleaning process and relatively simple compared with taconite processing. Taconite ore, with only 30% iron content, cannot be used directly in the steel mills; to be usable the iron content must be concentrated. Reduced to its essentials, the process is to crush the taconite so that the magnetite can be separated from the silica magnetically, then to agglomerate the resulting concentrated magnetite into pellets suitable for shipping and charging the blast furnaces.

Complicating this basic process are two physical characteristics of taconite. One is that taconite is extremely hard and dense with an average compression crushing strength of 55,000 pounds per square inch and an average weight of 2.45 long tons per cubic yard. The other is the fact that the magnetic particles are so fine that to free them for magnetic concentration takes grinding to minus 325 mesh, which is in the particle size of silt.

STAGES OF MINING ON THE MESABI RANGE



1. A cross section of the Mesabi Range, showing the relationship of natural ore, low grade ore, and taconite.



2. Early open pit mining resulted in the stripping of the drift (surface stockpile) and removal of the natural ore and most of the lean ore. Also stocked are some lean ore and non-magnetic taconite.

FIGURE II (Page 1 of 2)

Crushing and concentrating this ore requires massive and complex machinery and extremely expensive plant facilities. Reserve Mining Company's facilities required an investment of $310,000,000, including an expansion and Erie Mining Company required an investment of $350,000,000, also including one expansion.

Taconite is drilled with a jet flame piercing machine as it is too hard for effective use of conventional drill bits. It is then blasted and transported to huge crushing machinery, finally crushed to gravel size. Large rod and ball mills then grind it to powder and the magnetite is separated by magnetic means. The mud-like concentrate is formed into balls, then baked into hard pellets containing an iron content of about 60 percent.

For every ton of taconite pellets produced, about two tons of overburden and waste rock have to be moved and disposed of, and two tons of finely-ground "tailings" are produced and require disposal. The process also requires large volumes of water. Though much water is recycled in a closed system in most of the plants, considerable volumes of fresh water are needed to replace losses from the system. It is the need for large areas of land for the mines, waste rock and tailings dumps, and water supply impoundments that has the most direct impact on the surrounding land.

4. Soils

The outcrop area of the Biwabik Formation, like the adjacent areas on the south slope of the Giant's Range is covered with soils that range in depth from zero at the outcrop areas to slightly over 200 feet in the deeper areas. This overburden includes a variety of soils of both mineral and vegetable origin including sands, gravels, boulders, hardpan, silts, clays, loam and muskeg. Those deposits of mineral origin are drift associated with the Wisconsin glacier, with the Carey and Mankato substages being of primary importance. The glacial deposits are of limited extent and primarily occur in small outwash plains and eskers. In general, the soils of the Mesabi Range may be described as reddish brown, acid, moderately coarse textured and well to poorly drained glacial till and grayish to yellowish,

acid, coarse textured, excessively well to poorly drained glacial outwash. The dominant soil series is the Conic, Barto and Toivola soils which are somewhat acid and low in fertility.

The soils on the north slope of Giant's Range are described as grayish, slightly acid to calcareous, fine textured and well to poorly drained lacustrine deposits and deep, reddish-brown, acid, moderately coarse textured and well to poorly drained glacial till. The major soils of this region are Crosswell and Swatara soils and are characterized by being acid and also low in fertility.

More specifically, no detailed soil classifications are available for the proposed project area. The General Soils Map of the Superior National Forest shows two general soils areas that would be affected. Soil Area 8 is the type along the Giant's Ridge on the divide. Soil Area 5 is the type that would be affected by the north part of Inland Steel's project.

In soil area 5 the general soil is comprised of deep, grayish, slightly acid to calcareous, fine-textured and well to poorly drained lacustrine deposits and deep, reddish-brown, acid, moderately coarse textured and well to poorly drained glacial till. The dominant slope classes are 3-6 and 6-18 percent. The dominant soils are unnamed sandy loams. Management potential is fair to good, campsite suitability fair, and timber production potential fair to good.

In soil area 8 the general soil area is comprised of deep, reddish-brown, acid, moderately coarse textured and well to poorly drained glacial till and deep grayish to yellowish, acid, coarse textured, excessively well to poorly drained glacial outwash. Sand and gravel deposits are common. Eskers are located in the eastern 60% of the area. The dominant slope classes are 6-18% and greater than 18%.

The dominant soils are Iron River sandy loam, Toivola sandy loam, and unnamed sandy loams and unnamed gravelly loamy sands. Management use potential is moderate to good, campsite suitability fair to good, and timber production potential fair to good.

Beyond the areas actually used, no effect on soils are foreseen, and no erosion is expected as a result of the proposal.

5. Climate

The low-fertility condition of the soils acting with the adverse weather conditions limit agricultural development in the area. The climate is considered to be of the interior continental type. The average January temperature is 8.3°F while the average July temperature is 68.1°F. Recorded temperature extremes include -45°F in January and 103°F in July. The average annual precipitation at Virginia is 26.91 inches per year with 49% falling during the growing season. Rainfall intensity ranges from a one year 30 minute rainfall intensity of 0.8 inches to a one year 24 hour rainfall intensity of 2.1 inches. The snowfall averages 50 inches per year and there are an average of 140 days with one inch or more snow on the ground. May 28 is the average date for the last spring freeze and the first fall freeze normally occurs about September 16.

6. Wildlife

Virtually complete destruction of the virgin forest by clear-cutting and fires served to create a far more favorable habitat for wildlife such as deer and grouse in northeastern Minnesota than had previously existed. Wildlife communities and associations within Inland Steel's project area are typical of that of the general area and may be described as follows:

i. Species and Ecosystems

Wildlife communities and associations can be separated into three basic habitat groupings. These groupings are quite general and predator, prey and plant species often overlap between the different habitats. Also, there are crossovers between mammals and birds among the various trophic (feeding) levels.

Basic habitat communities are: (1) timbered areas consisting of pole stage and somewhat larger trees which generally cover about 85 percent of the land

and consist of stands dominated by white birch or aspen; (2) low lying areas which comprise about 3 percent of the area and which contain water for a large portion of the year and have as their principal species black spruce or black ash; and (3) openings and lowland brush which comprise less than 5 percent of the area and consist of abandoned fields being encroached upon by willows. Development covers the remaining 7 percent of the area.

Although there are three basic habitat types, the wildlife communities and associations are dominated by species which thrive in the prevailing timbered habitat. This results from the fact that the low lying wet and open brush areas are so small and scattered they cannot support a separate and distinct wildlife community. This is not to say these wet and open parcels do not influence the overall wildlife community, but the species utilizing them are largely those which thrive in the dominant forested habitat. For example, whitetailed deer are primarily reliant on the dominant timbered habitat but use the low lying conifer areas during severe winter periods and are attracted to the openings for succulent foods in the spring. By contrast, species such as sharp-tailed grouse, which require large expanses of open areas, and herons or mink, which require large amounts of wetlands and open water, are absent from the area or exist in low numbers. Song birds also are dominated by those species that thrive in wooded areas, including the least flycatcher, hairy and downy woodpeckers, chickadees, yellow warblers, etc. Species such as red-winged blackbirds, swamp sparrows, robins and cowbirds are absent or present in very low numbers. Table III describes dominant species of flora and fauna present.

Furbearers of commercial value include skunk, weasel and red fox. Mink and muskrat are of commercial value but occur in very low densities due to a shortage of either standing or flowing water. The location of an old beaver colony was observed but the site probably is no longer capable of sustaining a colony.

TABLE III. DOMINANT SPECIES

MAMMALS

Predators	Prey and Low Trophic Level Consumers
Coyote	Whitetailed Deer
Timber Wolf	Snowshoe Hare
Red Fox	Mice (several species)
Bobcat	Red Squirrel
	Flying Squirrel

BIRDS

Predators	Prey and Low Trophic Level Consumers
Broad-winged Hawk	Ruffed Grouse
Cooper's Hawk	Warblers
Great Horned Owl	Jays
Barred Owl	Thrushes
	Sparrows
	Other Woodland Song Birds
	Grosbeaks

UPLAND PLANTS

Trees	Shrubs	Groundcover
White Birch	Mountain Maple	Large-leaf Aster
Quaking Aspen	Round Dogwood	Bracken Fern
Large Toothed Aspen	Bush Honeysuckle	Violets
Balsam Poplar	Beaked Hazel	Anomone
Hard Maple	Juneberry	
Red Maple	Blueberry	
Balsam	Raspberry	
White Spruce		
Red Pine		
White Pine		
Jackpine		

LOWLAND PLANTS

Trees	Shrubs	Groundcover
Black Spruce	Tag Alder	Sphagnum Moss
Balsam	Willows	Pitcher Plant
Tamarak	Red-osier Dogwood	Cranberry
Black Ash	Leatherleaf	
	Labrador Tea	

Game providing significant hunting recreation are white-tailed deer, snowshoe hare and ruffed grouse. Waterfowl population of the project area is low due to a shortage of habitat but there may be some possibility of woodcock hunting in northern portions of the area during the fall migration.

At one time the area may have supported good white-tailed deer population, Presently, the population is dwindling. Successional changes have undoubtedly brought about deterioration of the habitat and relatively severe recent winters have contributed to a decrease in deer abundance. These population and habitat conditions are typical of this general area of northeastern Minnesota.

No specific information is available regarding abundance of ruffed grouse. Much of the area is suitable habitat and several miles of old roads and trails provide a favorable hunting opportunity. For this general area of northeastern Minnesota, the project area is considered to be no better than average from the standpoint of the grouse population and the quality of the habitat.

Snowshoe hare populations vary widely. Having passed the low point and now on the increase, snowshoe hare may now be moderately abundant in low lying areas.

Populations of coyotes, foxes and bobcat can be considered as moderate to sparse, with no one species being dominant. Timber wolves can be best described as occasional visitors to the area rather than permanent year-round residents.

ii. Fisheries Resource

Three streams are located in the project area. Wouri Creek arises within the proposed tailings basin area and runs north to join the Sandy River, which runs from the outlet of Sandy Lake eastward to Pike River. Laurentian Creek, originates in the valley south of Lookout Mountain and flows northerly to join Sandy River about one-half mile east of Sandy Lake. Sauntry Creek arises within the proposed waste disposal area and flows southwesterly to Virginia Lake.

Wouri Creek is a small, flowing stream reportedly containing minnows, dace (locally known as mud-minnows) and chubs. Suckers use the stream for spawning, and there are reports of brook trout in lower sections of the stream. The state does not stock the stream and fishing pressure, if any, is probably very low .

Laurentian Creek probably contains minnows, dace and chubs within the project area, but no fish have been observed in this headwater portion of the stream. Beginning about three miles downstream from the project area the creek attains sufficient size and has the other necessary characteristics to support brook trout. A fishable population of this species is maintained by the state through the stocking of catchable-size fish during the angling season. It is a state designated trout stream.

No known fish populations exist in Sauntry Creek. It probably contains a normal population of minnows and chubs. Since northern pike and common suckers are present in Virginia Lake, spawning runs of these species may occur each year.

7. Recreation-Aesthetic Setting

The Mesabi Range is one of the most interesting features of the northern Minnesota landscape. Many tourists pass through the area on their way to pursue lake-oriented recreational activities.

Although the activities of mining on the range are interesting historically and operationally, the visual impact from the air or ground is not aesthetically pleasing. Inland Steel has, however, done a good job in planning the layout of the proposed operation. They have taken advantage of natural features of the landscape to block the view of stockpiles and the tailings ponds. However, such prominent landscape changes will be visible from the air.

II. ENVIRONMENTAL IMPACT OF PROPOSED ACTION

A. Socio-economic Impact

The basic premise underlying this evaluation is that a single project cannot be evaluated in isolation from all other current expanding developments. With the depletion of the natural high-grade ore mines, the Mesabi Iron Range was in a state of depression, but the development of the taconite mining industry has revived and stabilized the economy of this area. Many studies and reports have been made on the economic impact of the taconite mining, the tremendous investments involved, the amount of employment, and the satellite industries that have been developed. There is little question that the taconite industry is of great economic importance to this area.

For the five-county Northeastern Minnesota economic region, the yearly value of the three major economic activities has been described in Table I. These figures are felt to be proportionately the same today, or if anything, mining having a great proportion. Mining is carried on in only a very small portion of the area while timber is supplied by a very large portion of the area. On a per acre basis, the dollar contribution to the regional economy is much greater for mining than for timber plus recreation and other associated uses.

Taconite mining development is an expensive proposition as is indicated by the fact that over $1,000,000,000 has been invested to date in the Mesabi Range taconite plants. The industry is not as labor-intensive as the older natural ore mining, but generally more highly skilled workers are needed and the average wage for this industry is high. In 1969 there were 9,600 people directly employed by the taconite mining industry. Inland Steel Company's proposed facility, a 2.3 million ton per year plant, is expected to involve an investment of in excess of $70,000,000 and employ about 400-500 workers with an annual payroll of about $4,000,000.

The natural ore industry still employs a considerable number of people on the Mesabi Range, but these operations are expected to be phased out completely within the next 20 years. To maintain the economy of the area, these jobs will have to be replaced and the best chance of replacement is from expansion of the taconite industry.

Future projections of mining and taconite activity indicate a possible increase of 42% or more of total existing employment in the APJ area. Recent announcements by major taconite mining companies and unannounced plans of other mining companies for major developments and expansions have indicated definite employment demands which will occur between 1974 and 1990. The impact of all these operations must be evaluated on a cumulative basis. The following table indicates conservative and known estimates of this required labor force.

TABLE IV. LABOR FORCE STATISTICS

	Construction Work Force	Permanent Employees
Hibbing Taconite Co. (Bethlehem & PM)	2,000	1,000
Minorca Project (Inland Steel)	1,700	500
Minntac Expansion (USS)	1,000	500
Copper-Nickel Development	1,500	1,100
Mining Support Industries	100	200
Concurrent Projects	3 6,300	3,300
Peak Constr. Work Force in Area	2,100	
Transient Construction Workers	-1,400	
Constr. Workers who Remain in Area	700	
Net Employment Gain	4,000	
Available Local Labor Force	-1,500	
In-Migration of Labor Force	2,500	

It would be expected that the additional people would, again, be made available from the declining natural ore operations across the Mesabi Range - many of whom would choose to commute from their present residence. Additional employment opportunities would be made available through the satellite industries which furnish the supplies and services essential for production.

Age levels in the current mining labor force and skill levels in the general area labor force indicate that a considerable number of steel erection workers and even permanent mining employees may be drawn from outside the APJ areas and from out state. It is difficult for the mining industry to estimate the probable numbers of imported labor force, but a calculated projection of future employees coming from outside the APJ area would be 2,500 out of a possible 4,000 maximum number required.

By far the most significant impact of the proposed operation on the environment will be its effect on the area economy. The proposed facility is expected to require an investment of some 70 million dollars which will be expended over a three-year construction and preproduction period for materials, labor and equipment for the proposed facility. During that construction period the labor force might be expected to peak out at approximately 2,000 skilled and semi-skilled transient workers, most of whom would be purchasing housing, food, clothing and entertainment in the immediate area. Commercial and industrial establishments on the Range would be furnishing goods and services. Some of the materials required for construction, specifically concrete aggregates, would undoubtedly be supplied from local sources. Some of the plant equipment would be manufactured either on the Mesabi Range or elsewhere in Minnesota. During this construction period, Inland Steel would be building up its permanent labor force for preproduction stripping and mine development. These people would undoubtedly be drawn from the ranks of the unemployed natural ore miners.

Upon completion of the Inland facility, the preproduction work force would have to be expanded to provide a staff of approximately 500 people for initiation and continuation of the operation. It would be expected that the additional people would be made available from the declining natural ore operations across the Mesabi Range - many of whom would choose to commute from

their present residence. Additional employment opportunities would be made available through the satellite industries which furnish the supplies and services essential for production.

For the mining of taconite, those supplies and services involve the purchase of explosives, drill bits, dipper teeth, fuels and lubricants, electric power, tires, maintenance and miscellaneous supplies. The crushing and concentrating of taconite require the purchase of power, lubricants, crusher liners, screen cloth, mill liners, grinding rods and balls, conveyor belting, material handling wear liners, starch, caustic and miscellaneous supplies. The agglomeration of the concentrates requires the purchase of power, natural gas or fuel oil, bentonite, grate castings, refractories, filter cloth, screen cloth and miscellaneous supplies. In addition, fixed and mobile equipment must be replaced at specified intervals. Besides benefiting the satellite industries, delivery of these materials would provide work and profit for rail and truck transport agencies.

This project will have some effect on the local transportation network in the immediate area. The access to the plant facility will be located in the NE NE of Sec 31, T59N, R17W. It will be an all weather two lane road that will be a little more then one mile in length. The road will handle about 400 vehicles in a 24 hour period. The plant will operate on three shifts and the two peak traffic periods are expected between 6:30 to 8:30 A.M. and 2:30 to 4:30 P.M. A much lighter shift change will occur between 10:30 P.M. and 12:30 A.M. Heavy commercial traffic will account for 5-10% of the traffic volume.

The surrounding local, county and state highways will also have corresponding increase in traffic volume due to the plant construction. It is possible that County Road 53 north of Virginia may be re-routed to the NW NE of Sec. 6, T58N, R17W. However, this is not anticipated to occur until 10 or 15 years in the future. Inland Steel will initiate action with city, county

and state officials at the appropriate time to discuss and plan this relocation.

The possibility of a railroad fill parallel to Highway 53 and 169 suggests a potential drainage problem. At this time, such a problem is not anticipated. It is reasonable to assume that the railroad would have considerable interest in maintaining drainage to protect their investment as well as the highway drainage. A ditch will exist between the two grades and all railroad grades will be vegetated.

Of significance, too, is the favorable economic impact of the proposed operation on the tax revenue accruing to the municipalities, school districts, counties, state, and the federal government from occupational royalty and taconite taxes assessed against the operation, and by sales, income and real estate taxes paid by employees directly or indirectly involved with the operation. The distribution of the taconite tax can be expected to be as shown in Table V.

TABLE V. ESTIMATED DISTRIBUTION OF TACONITE TAX

Taconite Property Tax Relief Account	47%
School District	27%
City, Village or Town	11.5%
County	11.5%
State	3%

Because the population of Virginia has decreased by 11.3 percent in the past decade, the slight population increase expected in the area should pose no serious burden on the public services available.

However, the influx of people into the area could well create a need for additional housing development with its attendant spur to the economy. Additional people mean added dollars spent for goods and services, thus expanding retail and wholesale trade in the area. Assuming an average of one family/dwelling unit per mining employee, and an average of three persons per household, the net population gain from in-migration of 2,500 employees would be 7,500, most of whom would not be directly related to this project.

It is reasonably conclusive that substantial new housing development will be needed between 1974 and 1984. It is extremely important that suitable locations should be encouraged instead of allowing scattered, uneconomical development to occur in marginal areas. The locations where new development might occur will be determined from the following factors: *proximity to employment centers, *proximity to commercial-service centers, *proximity to public facilities (such as sewer and water utilities, schools, fire and police protection, ect.) and *proximity to natural amenities (lakes, woods, rural tranquility) vs. the higher densities of urban settlements.

Existing historical urbanized areas in the APJ have reached a density saturation point as far as single family dwelling units are concerned. Available housing is severely limited. Various proposals for increased apartment building construction or even highrise structures have had only minimal response. The proliferation of mobile home parks is the most predictable development which might occur. Several fringe areas, between urban and rural settlements, have been identified as potential development areas because of the preceding considerations and existing water and sewer facilities which service most of these areas. About 45 percent of Virginia's nine square mile corporate limit is mining property. The city council is actively looking for more housing

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*Proximity in terms of driving time or commuting distance has increased since 1960 due to greater affluence, but with forthcoming energy (fuel) shortages this distance may shrink substantially.

development space and the mining companies are cooperating by providing some land. Presently there are about 200 acres of property available on the south edge of the city and 120 acres on the west side available for residential development.

Available private land suitable for residential development and properly zoned is also a prime consideration. The proximity factors listed above were final major determinants in identifying six areas where future development should and is likely to occur. The areas which have been identified include Hibbing, Town of Stuntz, Chisholm, Mountain Iron, Town of Fayal and Gilbert.

The proposed "Minorca" project by Inland Steel is in close proximity to the area between Mountain Iron and Virginia. The City of Virginia cannot absorb significant substantial growth, and the historic urbanized Village of Mountain Iron is destined for eventual relocation because of future mining activity. The area in-between is known as the South Grove-Mud Lake area and contains substantial available land which is suitable for development. Public utilities can be provided to this area based on existing plans for expansion and improvement for treatment plant facilities.

The significance of favorable economic impact of the proposed operation on the tax revenue accruing to the municipalities, school districts, counties, state and the federal government from occupational, royalty and taconite taxes assessed against the operation, and by sales, income and real estate taxes paid by employees directly or indirectly involved with the operation, must also be weighted against increased burdens on local governments. The fiscal capability of local governments, even with increased taxes and revenue sharing is usually not adequate to provide sewage treatment plants which meet EPA standards without major federal assistance.

The assimilative capacity of Iron Range communities to absorb this in-migration must be examined in relation to existing sewer and water service areas and available land in appropriate locations.

The City of Virginia has acquired funds and has completed a study of sewage system needs. Presently the city is letting bids for a sewage treatment facility, which will be one of the first in the state to comply with PCA regulations. It is of interest to note that Virginia has achieved phosphorus removal capability or its equivalent in its sewage treatment plant. Storm and sanitary sewer separation has been recommended and is likely by 1980 in Virginia.

Inland Steel has proposed an alternative emergency groundwater appropriation source the Mud Lake area consisting of 3 wells and a major pipeline which would bisect the area. Proper routing and screening can eliminate any conflict between the proposed pumps and pipeline and any residential development in the area. The groundwater sources for the emergency water appropriation is not desirable for domestic consumption according to Inland Steel.

In summary, current efforts have been initiated to advise the range communities that the prospects of future growth are very eminent and, that planning for orderly growth and change is a fiscal necessity as well as a major determinate in preserving the quality of life in viable communities.

Various mining companies have also been advised of their responsibility and ability to assist in guiding suitable development. In order to minimize any adverse effects of sudden growth, it is recommended that a working partnership be developed between government and private enterprise. This is not only possible but has already been discussed on a preliminary basis with representatives of the proposed taconite project.

The socio-economic and environmental impact of this and all development proposals would be most properly evaluated in the context of a regional land use development plan. The development of such a regional plan is the responsibility of local Regional Commissions. However, the local agencies are awaiting state land use planning guidelines. The state guidelines, when developed, will provide the framework within which the Regional Commissions will work.

B. Land

Figure III represents the daily material requirements for the taconite production at a production level of 2.3×10^6 tons per year. This rate of material flow necessitates utilization of a substantial amount of land. Table VI shows the breakdown of land use by specific use while Table VII shows the rate of surface area involvement.

TABLE VI. LANDS INVOLVED IN TACONITE PROJECT

A.	Total land controlled by Inland Steel	8,700 acres
B.	Total area disturbed by mining	5,517 acres
	-North of Laurentian Divide	
	Tailings Basin	2,810 acres
	Plant Site and Settling Basin	155 acres
	Pipelines, transmission lines, tracks, roads	45 acres
	TOTAL	3,010 acres
	-South of Laurentian Divide	
	Ordean-Allen Open Pit	297 acres
	Minorca Open Pit	458 acres
	Overburden, lean ore, Waste Rock and Course tailings dump	1,524 acres
	Sauntry Creek Settling Basin	56 acres
	Sauntry Reservoir	52 acres
	Pipelines, transmission lines, tracks, roads	120 acres
	TOTAL	2,507 acres

During the three-year construction and preproduction stage, the lands directly involved in preparation of the plant site and its settling basin, the Sauntry Creek settling basin, the Sauntry Reservoir, and as right-of-way for tracks, pipelines, transmission lines and roads will be totally committed. However, preproduction clearing, stripping and mine preparation will only involve about 180 acres of the Minorca Pit, deposition of waste stripping in the waste disposal area should only involve 150 acres; and construction of the initial tailings basin dam and impoundment of entrapped waters should not exceed 100 acres. Therefore, the total land area directly involved in the operations at the start of production is 858 acres. From that point on to the exhaustion of the reserve some 35 years later, there will be the following

MATERIALS FLOW FOR ESTIMATED INLAND STEEL DAILY PRODUCTION OF 6970 TONS OF PELLETS

(Based on 330 day annual operating period)

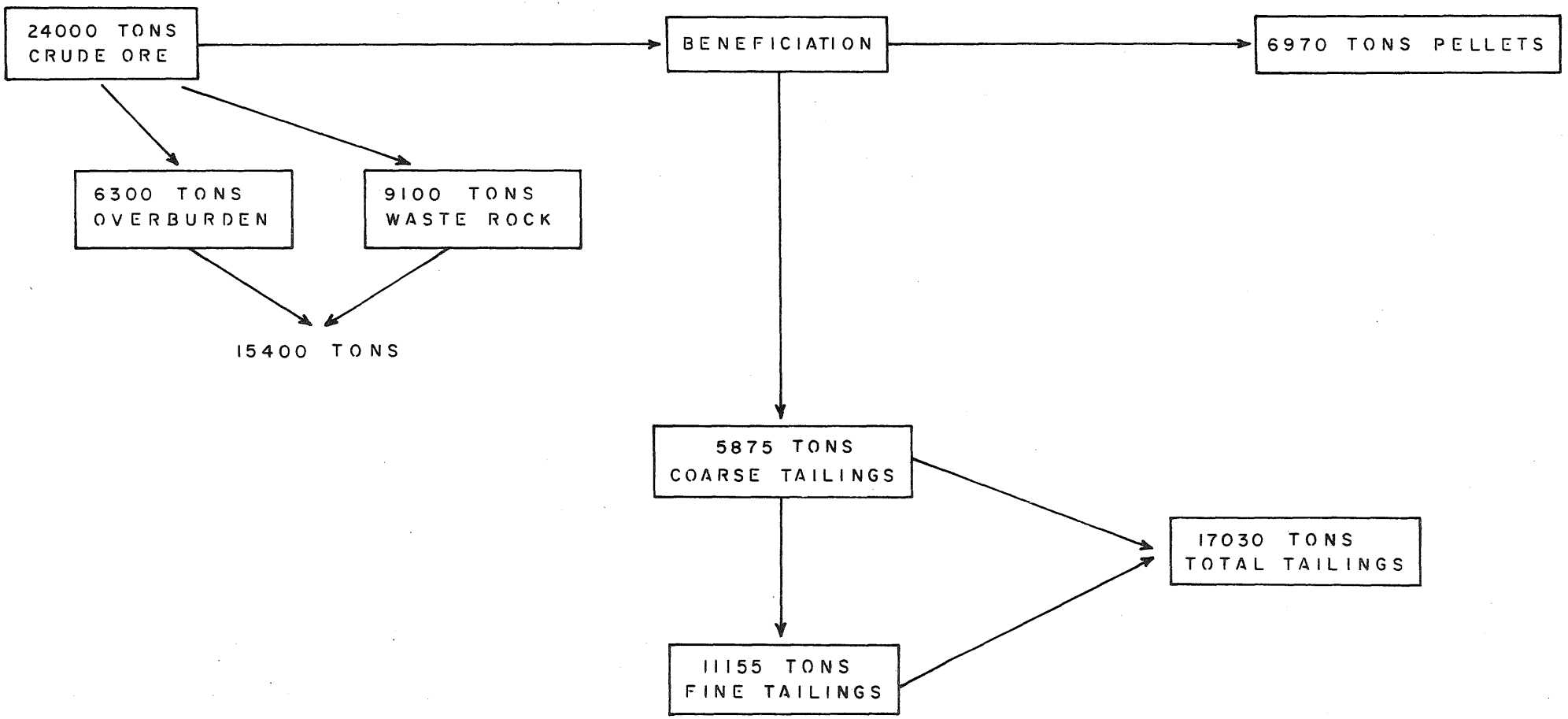


FIGURE III

GY : 3-74

gradual increase in the land area directly involved in the operation to the ultimate acreage heretofore designated:

TABLE VII. RATE OF SURFACE AREA INVOLVEMENT - ACRES

Year of Operation	Fixed Facilities	Mine		Waste Disposal Area	Tailings Basin	Total Area
		Ordean-Allen	Minorca			
5	428	20	425	745	560	2,178
10	428	80	458	944	1,100	3.010
15	428	285	458	1,140	1,650	3,961
20	428	297	458	1,452	2,100	4,735
Final	428	297	458	1,524	2,810	5,517

Development of the open pits and concurrent construction and operation facilities will make a drastic change in the environmental setting of the areas involved.

One mitigating factor is the phased development of a taconite operation. As the previous chart indicated, the amount of land subject to disturbance increases incrementally from a preproduction area of 858 acres to an end of production area of 5,517 acres. Reclamation will also proceed on an incremental basis.

In the same sense that areas are gradually committed to the various mining land uses, it can be assumed that an inventory of used and inactive areas ready for reclamation will build up during the life of the mine. While many areas such as the plant site, utility and transportation corridors, settling basins, and the surface of the tailings basin will remain active during the life of the mine, many areas such as the lift faces of the waste rock and overburden dumps and some sections of the tailings basin dike will become inactive long before the mine is exhausted. It is only reasonable to require that these inactive areas be progressively reclaimed.

There are three primary reasons for establishing an early and ongoing reclamation program:

1. Natural revegetation on the coarse waste materials is dubious. Previous studies have shown that such areas do not progress from pioneer to climax vegetation readily, but appear to retain a "steady state" of stunted pioneer volunteers. Progressive reclamation involving the use of soils available from continuous stripping as the mine pit expands may be necessary.

2. Reclamation techniques, successful or unsuccessful, will be identified at an early stage of the mining program.

3. The company will be able to write off the costs of reclamation during the mining instead of facing a large reclamation program during phase out.

Inland Steel will initiate and pursue reclamation on their lands not only to assist in complying with state reclamation standards but to determine desirable techniques in a successful program to restore the environment.

C. Physical Characteristics Impact

There will be some alteration of the physical characteristics of the area due to the mining. The greatest change will result from the tailings basin and the stock piles. During the operation, both these features will enlarge and change the landscape. The tailings basin, upon completion of filling, is expected to contain nearly 50 feet of tailings and will cover about 5 square miles. The waste disposal area containing the stock piles will cover an area of about 2.5 square miles. The open pits themselves will cover a little more than 1 square mile.

These will be the major changes in the physical features of the area. The nature of their raw appearance is expected to be improved by strict reclamation standards to be required by the State of Minnesota.

Naturally the geology of the area will be altered. Figure II presents

an insight to the nature of the expected change in the future geology in the area. Soils in areas to be covered with tailings or stock pile material will be lost until new reclamation laws require separation of overburden from waste rock. The purpose of the separation will be to utilize the overburden soil to provide a growing media for vegetation to be used for reclamation.

D. Water

1. Domestic Use

The City of Virginia has installed a well in the Virginia-Mud Lake Aquifer at the southwest corner of Section 12, 58-18 to serve as a standby source of waters under emergency conditions. To the DNR's knowledge, the City well has only been utilized on one or two occasions and then only for a short period of time because of the extremely high iron and manganese content of the water.

Prior to the development of this source under this permit, through installation of the three wells, one of which is at or near the same location as the City of Virginia well, Inland Steel shall perform such additional pumping tests as the Department of Natural Resources deems necessary to determine the possible impact of its operations, if any, on the output of the City well or on any private wells in the vicinity. Further, should those tests indicate that the proposed installation might have an adverse effect upon the productive capabilities of those wells, Inland shall take such remedial action as is necessary to eliminate or effectively minimize the effect of its operation on others.

2. Industrial Use

The United States Steel Corporation has been granted the right by the State of Minnesota to construct dams on the outlet streams from Manganika and Mashkenode Lakes and by means of interconnecting canals to divert waters from

those two lakes to its West Two Rivers Reservoir as a source of process water for its taconite operation at Mt. Iron, Minnesota. When and if construction is completed, this addition to U. S. Steel's process water system will serve to increase the tributary watershed area by 27.9 square miles to a total of 55.5 square mile area.

3. Plant Site Supply

To determine the availability of water for the proposed project, Inland Steel simulated taconite plant operations from 1928 through 1968 which is the period of the precipitation and runoff records available in the vicinity.

Climatological and hydrological information used include the following data:

1. Precipitation records from the U. S. Weather Station at Virginia, Minnesota from 1928 through 1969.

2. Flowage records from the U. S. Geological Survey on the Little Fork River at Little Fork, Minnesota from 1928 to 1968: flowage records from the Pike River near Embarrass from 1953 through 1964: flowage records from Sauntry Creek from 1958 through 1966.

3. Pit pumpage records from the Enterprise and Alpena Mines from 1952 through 1961 and pumpage records from the Enterprise and Sauntry Mines from 1963 through 1970.

The simulation model used summarized the data by quarter year increments. Such grouping of data has the disadvantage of clampering events of significant hydrologic importance which may provide significant additional water. Thus, it is reasonable to assume that such estimates utilizing quarterly totals are at least conservative.

Only one precipitation station was used in the analysis. Such records were applied to the local area and to the more distant watersheds of the Little Fork and the Pike Rivers. The runoff data was presented in runoff coefficients of cubic feet per square mile of drainage area. The runoff

coefficients for the Pike River were utilized for the tailings basin while those for Sauntry Creek were utilized for the mine and the plant site areas. The short runoff records for both the Pike and the Sauntry Creek were expanded by a graphic interpolation relating Little Fork runoff to Pike River and Sauntry Creek runoff. The groundwater contribution was estimated from mine pit pumpage records, estimated rainfall and runoff entering the pit and associated water levels observed. Figures IV and V summarize the sources of simulated process supply water required during the period of hydrologic record under normal and high seepage losses.

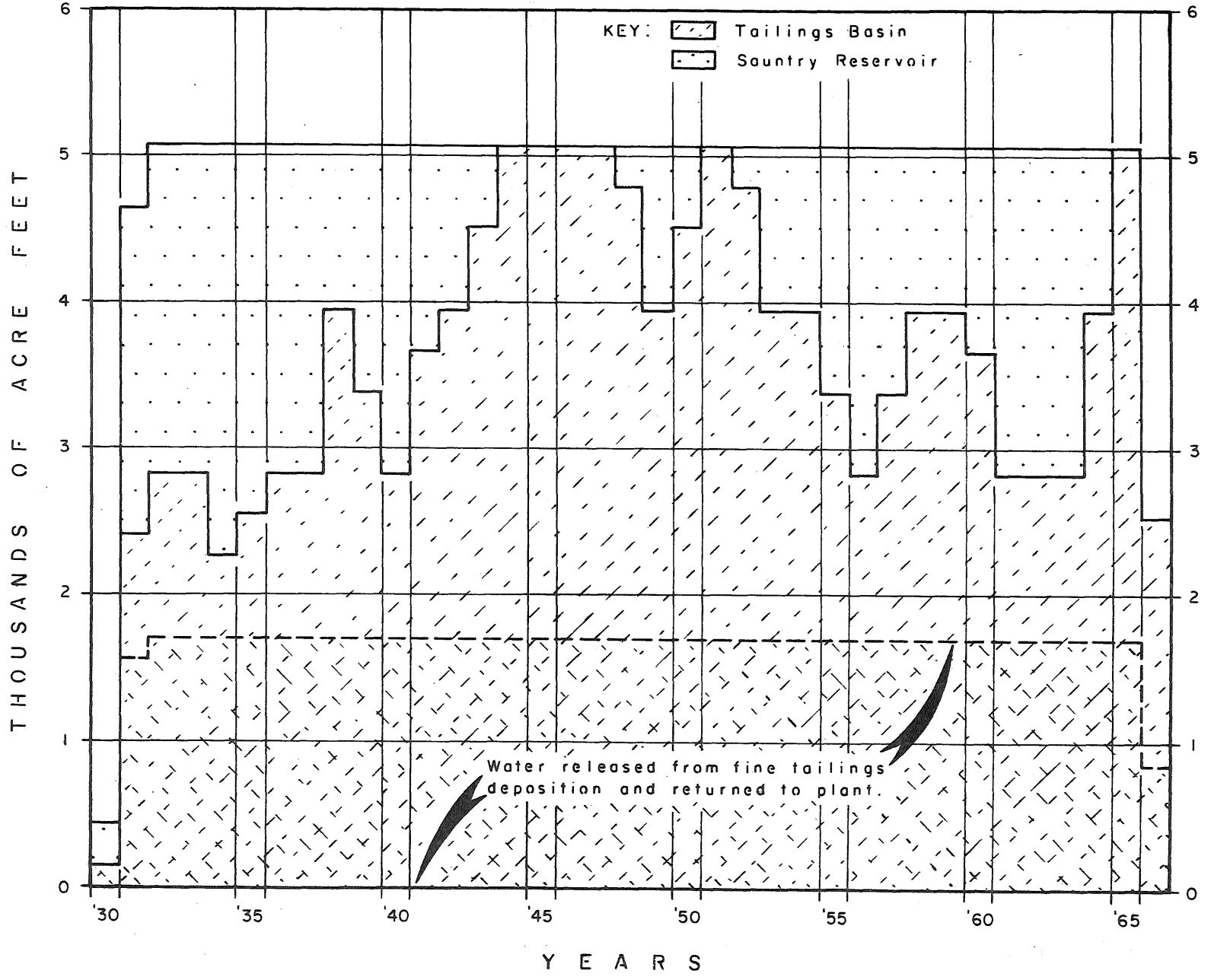
Of the 209 gallons of water requested per ton of crude ore, 54 gallons (26%) will be make up water from the Sauntry Reservoir Storage and 155 gallons (74%) will be obtained from the tailings basin which contains both return water as well as that stored due to average annual precipitation and runoff. This breakdown is based on what may be described as normal seepage loss from the tailings basin and the Sauntry Reservoir, which is anticipated to occur within 5 years from the project inception. Figure VI is a flow diagram showing the water input sources and water losses required for Inland Steel's estimated daily production.

Inland Steel's appropriation of surface runoff south to the Divide would be from 7.6 square miles of East Two River watershed or 13.75% of the total appropriation area allowed U. S. Steel; however, Inland's simulation of operations at the 2.3 million ton level of production indicates that its average appropriation from the 7.6 square mile area would be 1,314 acre feet per year of which 726 acre feet would be from ground waters not available by permit to U. S. Steel. Assuming that the average yield for the 55.5 square mile watershed area would be a rate of 0.71 cfsm, the total runoff per year would be 28,528 acre feet. The Inland appropriation of surface runoff for its purposes would reduce this amount by an estimated 2.06% and of total water by 4.61%

FIGURE IV

PROCESS WATER SUPPLY BY SOURCE FROM SIMULATED OPERATIONS

(Assumed Normal Seepage Losses)



THOUSANDS OF ACRE FEET

EXHIBIT "N"

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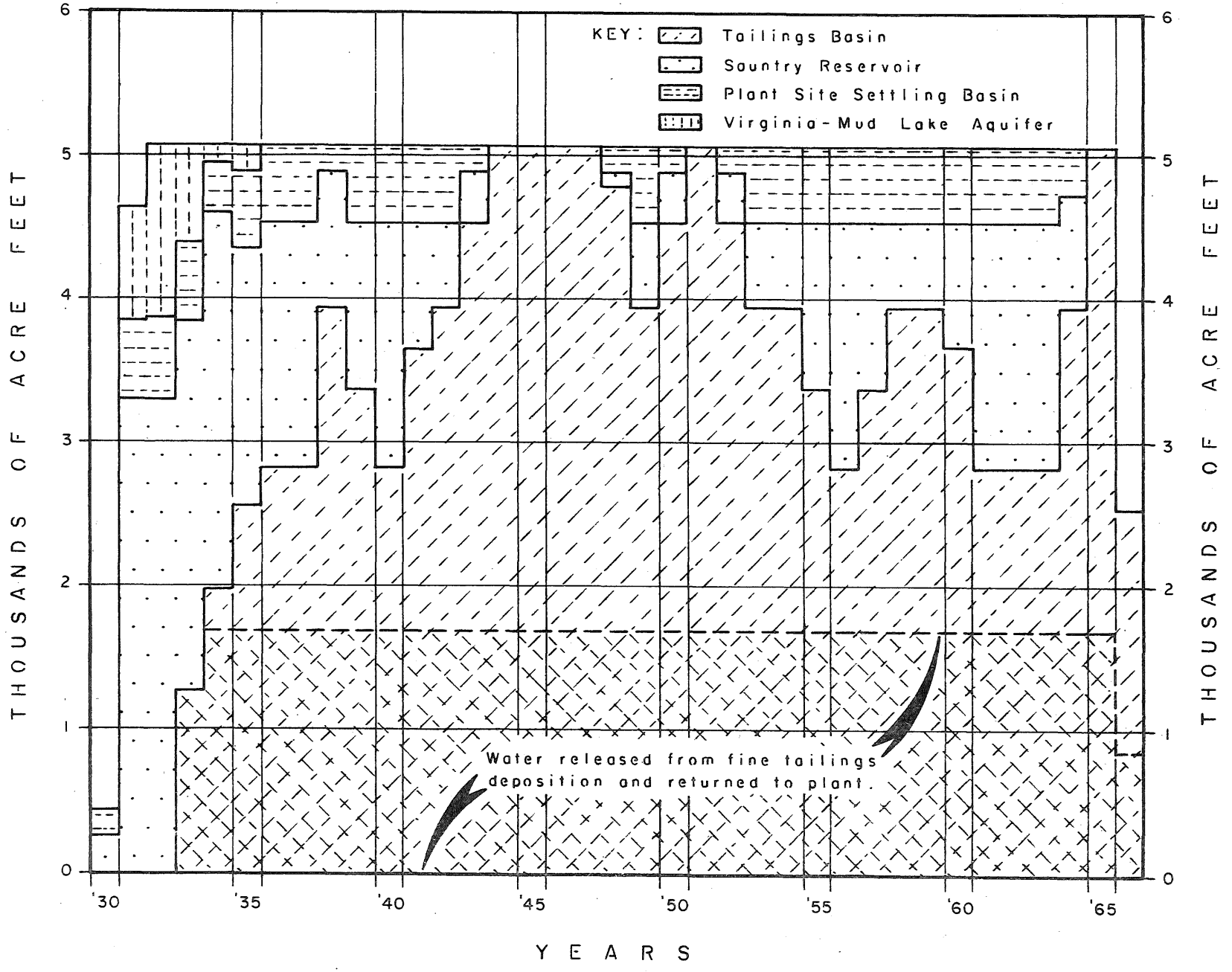
FIGURE V

PROCESS WATER SUPPLY BY SOURCE FROM SIMULATED OPERATIONS

(Assumed High Seepage Losses)



WATER REQUIREMENTS & LOSSES FOR INLAND STEEL ESTIMATED DAILY PRODUCTION OF 6970 TONS OF PELLETS

(Based on 330 day annual operating period)

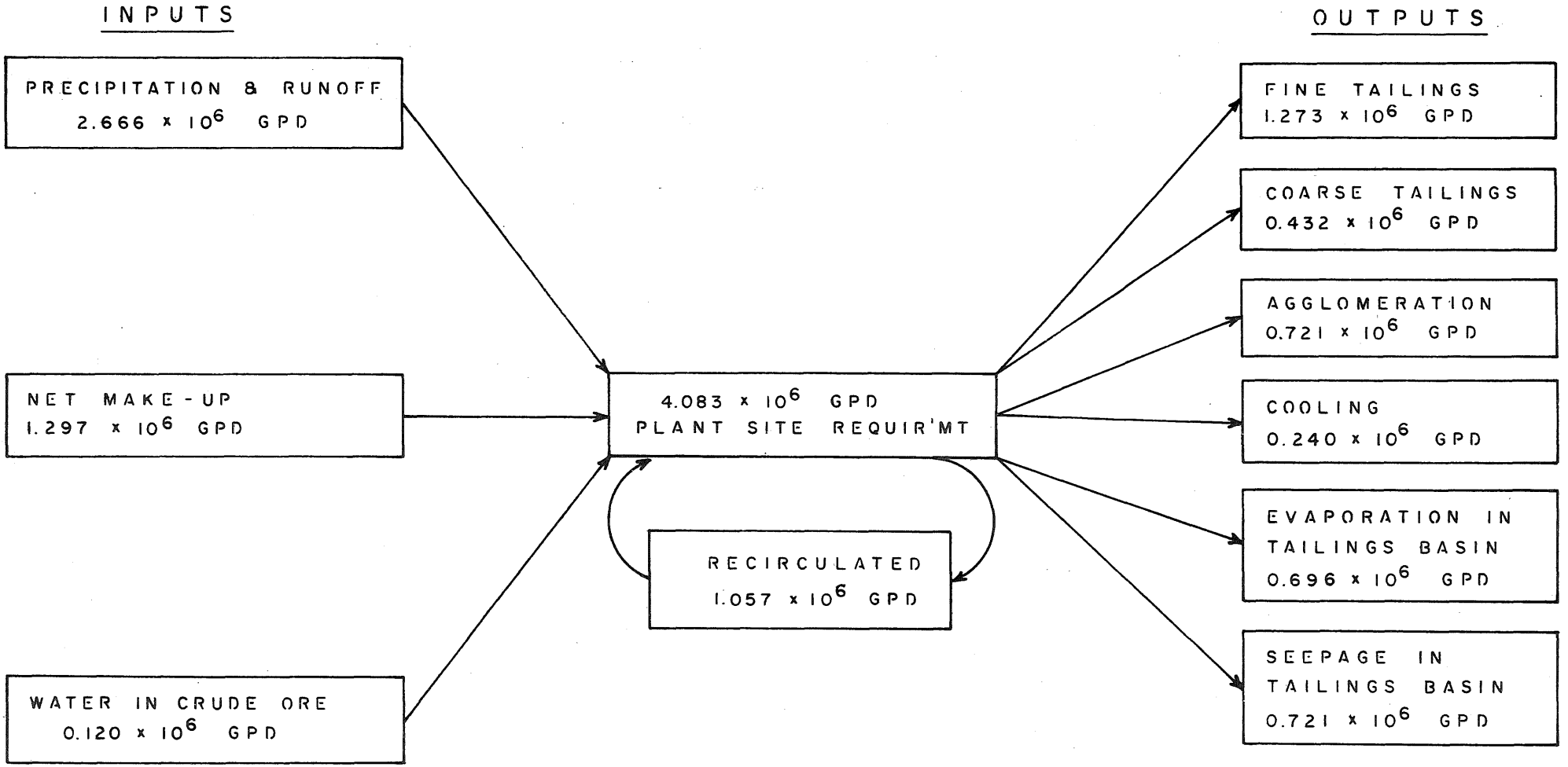


FIGURE VI

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In addition, Minnesota Power and Light and Northwest Paper and Wood Conversion all utilize waters from the St. Louis River near Cloquet. Inasmuch as the watershed area at Scanlon is 3,430 square miles, the Inland's proposed appropriation of a portion of the waters from the 7.6 square mile area (0.22% of the total) should not have any effect whatsoever on their operations.

4. Water Quality Monitoring

Mine waste dumps and tailings have very little effect on the quality of the water resource. The taconite and overburden rock itself is relatively inert and does not result in acidifying waters flowing from the dumps. The tailings ponds are composed of nearly all silica and are set up as closed water systems. Most of the water is recycled from settling ponds into the process. Some will be allowed to enter the surface drainage system, for low flow augmentation in Wouri Creek. There is some entry of water from the tailings ponds into ground water from seepage, of course, but this water appears to be no different from natural drainage water. Those old mine pits which have filled contain clear, clean water, some being used currently for municipal domestic water supplies.

In order to assure that the water quality of the streams in the area is not being significantly altered, the Minnesota DNR has requested that Inland Steel monitor Wouri Creek for the following information:

TABLE VIII. PARAMETERS TO BE MONITORED ON WOURI CREEK

Amonia - N	pH
Organic - N	Cl
Nitrite - N	Fe
Nitrate - N	Mn
Total - P	Cr
Ortho - P	Ni
Hardness	Cu
Alkalinity/Acidity	Zn
Total Solids	Hg
a) Dissolved	Turbidity
b) Suspended	Discharge
Specific Conductance	

The stream will be sampled monthly for one year. At that time the variability of the data will be evaluated to determine if monitoring needs to be continued or if the baseline established is sufficient.

Except for nitrogen and phosphorus, the same data will be collected on Sauntry Creek and such data will be subject to the same kind of analysis.

The changes of the surface contours, of course, do disrupt the surface drainage pattern. As the project is high on the Continental Divide, the disrupted streams are quite small and have only minor impact on the overall watershed flow. Inland's interruption of upper Wouri Creek could affect 3.3% of the volume of the Pike River at Vermillion Lake if low flow was not maintained. The deep and extensive mine pits have definite effects on the subsurface flow of water and continual pumping of them depletes the ground water stored in the surrounding aquifers. However, after a hundred years mining on the Mesabi Iron Range, this effect appears to have led to no major problems.

5. Aquatic Habitat

Wouri Creek, T59N, R17W, Sec 1, 12, 13, 14, 23 and 24, originates as a drainage from the hills to the south and flows north to the Sand River and then easterly to the Pike River. The creek has an east and west fork which join in Sec. 13 and just north of the fork is obstructed by an active beaver dam. This dam is about fifty feet long and has a two foot head of water. Each of the two forks originates in higher ground and flows north through low land.

Vegetation along the creek banks consists mostly of alder brush with swamp grass in the lower areas. Aquatic vegetation in the creek includes sedge, burreed and water moss. The average depth of the two forks is six inches and an average width of two feet. The water is dark in color with no suspended sediment visible.

North of the beaver dam the creek widens to an average of four feet with an average depth of ten inches. There are few riffles in the creek

with the more prominent being just below the beaver dam. Due to the narrowness and nature of the stream, there are few pools. The beaver dam temporarily acts as barriers to fish migration and no fish species have been observed. There is no indication of fishing pressure on the stream.

A few suckers and northern pike may migrate as far upstream as the beaver dam to spawn, with suckers being the most likely. The creek does not have the qualifications to be a trout stream. Northern pike may penetrate a short distance upstream to spawn, however with plenty of adequate spawning areas in the Sand River, this migration would be quite minimal.

Approximately six miles of Wouri Creek's flowing water will be eliminated by the tailings basin, including both branches of the Creek which join near the center of Section 13, T59N, R17W. The creek watershed area exceeds 5.0 square miles. Ordinarily, the elimination of this portion of the creek could be expected to substantially decrease the flow in the stream immediately downstream from the project area. However, most of this potential loss will be offset by underground seepage from the tailings basin. Any net loss that may result will be maintained by low flow augmentation of 0.5 cfs.

Laurentian Creek, T59N, R17, 18W, Sec 7,18,19,30,1,12,13,24 and 25, is a designated trout stream, stocked and managed for brook trout by the State of Minnesota, Department of Natural Resources. The stocking and management of trout is well downstream from the project area. In the project area, the stream originates in a small valley and flows northwesterly to the Sand River, then easterly to the Pike River. It originates mainly from seepage and runoff from the surrounding hills and there are few, if any, small springs. The creek flows mainly through low woodlands consisting of balsam, aspen and black spruce. Some birch and conifers are found near the extreme source.

The stream bed is of gravel-sand with scattered boulders, and becomes sand and muck near Highway 53. There are a few scattered small riffle areas with small pools. Water has a slight brownish color, with no suspended sediment visible. The creek, in the project area, averages two feet in width and six inches in depth. About 1½ miles downstream the creek widens to three feet and the depth increases to one foot.

There were no fish observed in the stream and there are no barriers to fish migration. Trout are stocked in the lower reaches of the stream and is so designed upstream through and including Sec. 24, T59N, R18W. In this area there is evidence of moderate fishing pressure. Trout could migrate up to the project area of the stream; however due to summer time warm waters in this portion, few, if any, would inhabit this area of the creek.

Because of the delicate nature of this stream, the Minnesota Department of Natural Resources will allow no discharge related to any mining activities or processing to enter Laurentian Creek. Natural runoff from undisturbed watershed is the only water that will be allowed in this creek.

Sauntry Creek, T58, 59N, R17W, Sec. 4, 5, 8, 33, 34, 35, originates northeast of Virginia and flows in a southwesterly direction to Virginia Lake. Beginning at Virginia Lake the creek has been dredged and has become a diversion ditch through the mining area for a length of approximately two miles. This portion of the creek averages approximately five feet wide and six inches deep.

Upstream from the old mine pit the creeks natural bed flows through woodland consisting of aspen, birch and scattered conifers. Some alder line the immediate banks of the creek. There is one low swamp area on the upper end of the west fork with alder and marsh grass. The creek in the upper reaches averages about three feet wide and gradually narrows closer to the source. The entire stream has little or no turbidity at this time, but could become slightly turbid during a period of heavy runoff. The water is

quite dark in color, but this is not due to suspended sediments.

The creek bed in the upper portions of the stream is primarily sand and gravel with scattered boulders. Some pools and riffles are present in the upper area, while riffles are quite numerous in the diverted portion due to its straight configuration. Vegetation in the creek itself is very sparse.

There are no barriers in the creek and no fish life has been observed. Due to the lack of northern pike spawning areas, it is doubtful that northern pike are present. Suckers would migrate from Virginia Lake up the creek and spawn in the small areas where rapids are available. These suckers would return to Virginia Lake, with minnows remaining as the only fish in the creek. Turbidity in this stream will be controlled by a settling basin capturing stock pile surface runoff.

The upper one and one-half miles of Sauntry Creek lying above the Sauntry Creek settling basin will be eliminated by the waste disposal site. However, the portion of the stream lying downstream from the Sauntry reservoir as well as Virginia and Silver Lakes will be benefitted by the diversion of 1,0 cfsm of excess flows during wet periods and the augmentation of low flows during dry periods. This will decrease stream turbidity resulting from bank erosion and bottom scour, and will help to stabilize the lakes.

E. Air

The major effect the taconite industry has on the quality of the air is from the plant's drying furnaces and power plants--the smoke and fumes emitted from their fuel combustion. Figure VII illustrates the plant power requirements and the resulting air discharges on a daily production basis. The actual processing of the taconite ore to concentrated pellets is a mechanical operation - not a chemical one - and therefore causes no chemical air pollution.

POWER REQUIREMENTS & AIR POLLUTANT DISCHARGES FOR INLAND STEEL ESTIMATED DAILY PRODUCTION OF 6970 TONS OF PELLETS

(Based on 330 day annual operating period)

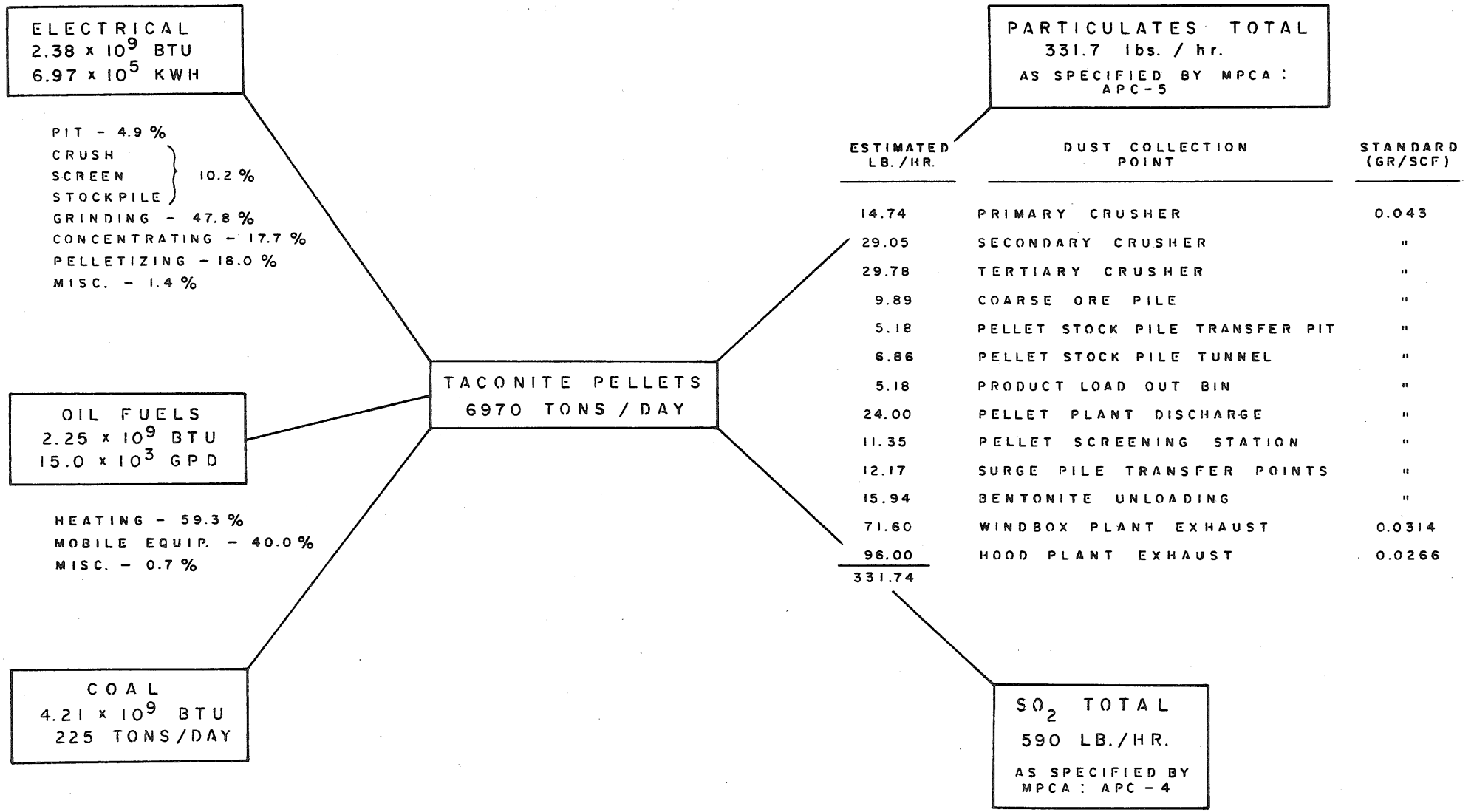


FIGURE VII

GY : 3-74

Dust can be a problem, but with the proper equipment and effort can be controlled. The actual crushing and pelletizing is a wet process and causes no problem. Blasting in the mines can obviously cause dust but many mines are actually within the city limits of the Range communities, and appears to cause little problem. The taconite tailings basins can become dry in places and dust is sometimes blown from them. Erie Mining Company has recently been planting annual grasses on portions of the basins likely to dry and blow even though these will be covered with fresh tailings in a short period. Inland will initiate similar control measures.

No effects on vegetation have been noted from dust or stack emissions from taconite plants. Dust from these plants has been at least a nuisance in adjacent towns.

Inland Steel recognizes that the tailings basin, the waste disposal area, the plant site and the open pits are all possible sources of air pollution and anticipates taking the following precautionary actions to eliminate or minimize the extent of that pollution.

1. Tailings Basin

The fine tailings in a slurry of 50% solids would be pumped to the north slope of the Laurentian Divide and released within the five square mile watershed of the tailings basin. Hillside discharge well above clear water pool elevation at a considerable distance from the pool would result in stacking of the tailings above water elevation as the coarser fractions would settle out with diminishing slurry velocities. If the tailings above water elevation are permitted to dry out and be exposed to action of the prevailing winds, wind erosion could occur and the atmosphere could become polluted with airborne solids. To minimize the possibility of this occurrence, even though the basin is remote from points of public usage or habitation, Inland will utilize the following control

measures:

1. Attempt to maintain a natural wind break by leaving the forest cover undisturbed within the tailings basin prior to deposition of tailings. The trees will eventually die but should still serve as a windbreak to reduce wind velocities.

2. Vary the points of discharge of the tailings to wet down the tailings slope.

3. Install snow fences or other artificial windbreaks and/or furrow the windswept surfaces.

4. Encourage revegetation by periodic planting even though the planted area will eventually be covered with fresh tailings. They do not discuss how often this will be done or with what type of cover.

2. Waste Disposal Area

The configuration of the overburden, waste rock, and coarse tailings stockpiles shown on Map 1 is intended to represent the ultimate appearance upon completion of the operation. This development is based on the premise that like materials produced from lands having varied mineral ownership may be commingled in stockpile and further, the stockpiles may abut each other provided precautions are taken to avoid excessive contamination of the iron formation materials. It is anticipated that each lift of the stockpiles would be restricted to a nominal 40 foot height with a drainage slope on the surface ranging from 0.1% to 0.2% to hold the runoff below the scour velocity of the material. The exposed slopes of the stockpiles would be terraced through control of the various lifts to enhance the appearance of the waste disposal area and to encourage revegetation. State reclamation standards will also be met once they are formulated. The site selected for the waste disposal area is well screened by terrain and forest cover from the prevailing winds to minimize the possibility of wind erosion of the exposed berms and slopes of the stockpiles with the resultant pollution of the atmosphere by airborne solids. To further minimize the possibility, Inland will revegetate the inactive slopes and berms at the earliest possible date. Further, Inland will

attempt to minimize wind erosion of the active stockpiles, should it occur, through erection of windbreaks of stabilization of the surface by water or chemicals acceptable to the Pollution Control Agency.

3. Plant Site

Fortunately the iron-rich amphiboles (Grunerite, Cummingtonite and Actinolite), which are believed to be the source of the asbestos-like fibers that could become a pollutant, are not present in the magnetite taconite of the Virginia area. They only occur on the eastern end of the Mesabi Range where the taconite rocks have been substantially altered by the cooking action of the gabbro and diabase intrusions. However, other possible sources of pollution from the plant site would be from the fuels used for agglomeration and heating, dust from the dry crushing operation and dust raised by vehicular traffic. Elimination of pollution from these possible sources will be accomplished through (1) installation of well-engineered dust collection and smoke elimination equipment meeting federal and state requirements; (2) hard surfacing of the plant site access roads and parking lots and periodic flushing of those areas into the plant site settling basin; and (3) surfacing of haul roads used by off-highway equipment with stabilized gravel and utilization of water sprays and/or applications of an approved chemical for dust control. Inland will meet all state and federal air quality standards.

4. Open Pits

Possible sources of pollution are fine cuttings from the rotary or down-the-hole drill rigs, road dust and exhaust fumes from vehicular traffic, and airborne particulates and gases from blasting operations.

Inland Steel will use water sprays to hold down the dust during the drilling operations and to control dusting of the haul roads. Blasting operations will be so controlled that the airborne solids and gases will be carried away

from areas of public usage and habitation. Haulage equipment will be maintained in good repair to minimize discharge of polluting gases.

F. Wildlife Impact

Vegetation in the area of activity will be greatly modified. Changes will range from total destruction in the plant site, settling basin, waste disposal and tailings areas to minimal disturbance in portions outside the main area of activity. Following disturbance, weeds will volunteer and slowly begin the process of revegetation. Unless aided by reclamation efforts, the disturbed areas would not rapidly revert, through successive stages, back to the existing vegetative types. Some areas of concentrated use such as roads or in the vicinity of the plant site, may be unable to support abundant vegetation permanently.

1. Mammals

With the loss and alteration of habitat brought on by disturbance, most mammals will be forced to seek more favorable habitat. Smaller mammals not able to move long distances will face early destruction. As the healing process takes place over decades, they will undoubtedly repopulate the area to the extent that it becomes habitable. Larger animals such as white-tailed deer and coyote will be forced to seek new living space as their habitat is destroyed. Deer often will persist even in areas of intense activity as transients. Removal of portions of the overstory will promote growth of forage and browse species, thereby improving summer range. Ultimately, some deer habitat will be lost.

The principal factor affecting the northern Minnesota deer herd is the amount and quality of its winter range. Cold weather and deepening snows force deer to seek heavy coniferous cover where snow depths are less and temperatures are significantly higher. Such cover comprises a small

portion of the overall range and deer tend to concentrate where winter cover is most favorable. Since there are no major winter concentration areas within the tailings basin or, for that matter, within the entire project area, the project is not likely to greatly affect the overall deer population within a 20-mile radius. There is ample spring, summer and fall habitat throughout the general area, and deer surviving the winter in areas adjacent to or well removed from the project area will travel into the area and maintain the population.

Deer populations are estimated by the U. S. Forest Service in this area at 10 to 15 per square mile, with an annual harvest of 2 to 5 per square mile. The total project area covering former state, county and private lands as well as National Forest land is approximately 5,500 acres; so overall approximately 8.5 square miles would eventually be lost to wildlife production as well as timber production.

The population of furbearers in the area is unknown, but is thought to be low. An active beaver dam exists now on Wouri Creek. Although some furbearer habitat will be lost, it is doubtful that the loss will have a noticeable effect on the present population.

2. Birds

Because of the number of species and their diverse habitat requirements, it is difficult to assess the total effect the development will have on the total bird population. Segments of the habitat will be lost for some period of years and for this reason the overall bird population will decrease. Ruffed grouse habitat will decrease as the area of involvement increases and presumably the grouse population will decrease proportionately. There is a distinct possibility that geese and ducks, which presently are absent from the area, will use the tailings basin during spring and fall migrations. This has occurred at other tailings basins along the Mesabi Range and is considered

a favorable environmental aspect of those projects.

G. Timber

The timber in the proposed project area is entirely second growth and a considerable area cutover. Aspen-birch types predominate, with considerable areas of upland and swamp hardwoods and some black spruce swamps. Most of the timber is below merchantable size, with some pockets of good pulpwood-sized aspen. There are about 20 acres of white spruce plantation.

Areas used by the mining companies are usually harvested of their merchantable timber before use. Mining areas are then stripped of remaining timber; dump and tailings areas normally are not. Water impoundments are normally cleared before flooding under state regulations.

The net result is obviously the elimination of the timber, and in fact, all the vegetation of the area being used for mining. However, there are little or no effects on adjoining timber resulting from these activities. Healthy stands of timber can be observed within a few feet of mining waste dumps or tailings ponds. At least one of the mining companies has a multiple use management plan for all of its properties, managing those lands not actually being used for mining for timber production, wildlife, and recreation. Timber is harvested and some areas reforested. The mining companies also attempt to acquire enough land so that they are able to leave a screening strip of timber around their operations, both for security and for aesthetic reasons.

To put this project area's effect on the timber resource into perspective, it should be pointed out that St. Louis County has an area, including water, of 4,539,000 acres. Of this, 3,796,000 acres (83.6%) are classified as forest and undeveloped land. The total project area is about 6,000 acres. Therefore, the total project area is 0.15% of St. Louis County's forest land area.

None of the project area is known to have any unusual or especially significant vegetative types. The timber types are typical of the vast

forested areas found throughout northeastern Minnesota. Large percentages of these forested lands are in federal, state and county (tax-forfeited) ownership, and significant areas in large timber company ownership, all available for public use.

Timber growth would obviously be lost once the lands were used for mining, though this would not occur over the entire area for several years. Loss of this area should not have an appreciable adverse impact on the economy, particularly as the timber harvest in the region has not reached the level of allowable cut, especially in some species. Because of low value species or currently non-merchantable and small size, the timber on the requested land is considered to be barely merchantable except for a few patches. No cruise or appraisal is available at this time, but total merchantable timber value on the National Forest lands is estimated at $14,000 to $16,000.

H. Outdoor Recreation

Along with the timber cover and wildlife, the usual forest recreational uses of hunting, fishing, hiking, and snowmobiling will be eliminated by the proposed project. Hunter use on the Virginia District is quite heavy since it is accessible, near population centers, and is good upland game habitat. Because of the slight expected population increase, there will result a change in fishing and hunting pressure in the area. However, because of the uncertainty of the energy crisis and its effect, it is impossible to predict the net change on fishing and hunting activities.

Inland's proposal will cut off the popular and heavily used Laurentian Divide Snowmobile Trail. Company officials have indicated the company will cooperate in relocating the trail on the north side of the project area. The company will be required to reconstruct the snowmobile trail on a new location and acquire an easement for the relocated portion of the trail in the name of the United States.

The Sauntry Creek flows into Virginia Lake which is interconnected by culverts to Silver Lake. Once used for storage of saw logs for the Bailey and Virginia and Rainy Lake Mills as heretofore stated, both lakes have since been cleaned up and developed for recreational and park purposes. As a consequence, waters from Sauntry Creek are deemed essential by the City of Virginia to provide a continuing source of fresh water to the lakes.

Inland's plan for operation of its facilities should provide a beneficial rather than detrimental effect on the two lakes. Appropriation of waters from Sauntry Creek flowage would be only during the spring runoff when flood flows in excess of 1.0 cfsm would be diverted into the Sauntry reservoir but then only to the extent needed to replenish that reservoir. In addition, the Sauntry Creek settling basin would serve to entrap a portion of the spring runoff and store it until it could be drawn off as needed during the dry summer months. Its 942 acre feet of stored water (supplemented by drainage of process waters from the coarse tails stockpiles) could be drawn down at a rate of over 2,000 gallons per minute on a continual basis from June 15th through September 15th of each year to augment normal runoff from precipitation as a source of fresh waters for the two lakes.

The Applicant's plan for appropriation of waters from the sources north of the Divide would affect, to a nominal extent, the areas of the following watershed units whose flowage also serves the public for recreational uses:

TABLE IX. WATERSHEDS AFFECTED BY INLAND PROJECT

Watershed Unit	Drainage Area Square Miles	Portion Involved Square Miles	Portion Involved % of Total
Rainy Lake at International Falls, Minnesota	14,530	6.41	0.04
Vermilion River below Vermilion Dam	483	6.41	1.33
Pike River at Pike Bay on Vermilion Lake	194	6.41	3.30
Pike River near Embarrass, Minnesota	115	6.41	5.57

The involvement in the drainage areas of the above described watershed units would be through the tailings basin with its 5.35 square mile watershed area and the plant site settling basin with its 1.06 square mile watershed area. Of these, the only anticipated appropriation of waters under normal conditions at the 2.3 million ton production level would be from the tailings basin watershed unit where its impoundment of run-off should be appropriated to conform to the desires of the State of Minnesota Department of Natural Resources and the Pollution Control Agency. The extent of that appropriation would be governed by the extent of seepage losses from the basin and would form the primary source of water for the operation. The actual amount appropriated from the plant site settling basin to supplement this source would be entirely dependent upon the availability of make-up waters from the Sauntry reservoir.

I. Natural Beauty

This environmental factor is the one most obviously affected by the proposed taconite mining uses and also the most difficult to define and evaluate. The Mesabi Iron Range is a landscape characterized by the obvious effects of mining activities. Some of the huge open pit mines are tourist attractions and they are undeniably spectacular and awe-inspiring. The waste dumps are the most obvious features to people travelling through this area. They are large, flat-topped, steep-sided piles of rock and earth. A few of the older ones are more or less revegetated with aspen, birch, brush and some planted pines. Many are still bare of visible vegetation .

Most of the new taconite mines and tailings basins are not readily visible, being away from main roads and below or at ground level. The waste piles are more obvious. Inland Steel's proposed project would be highly visible from Virginia, not that this would be an unusual feature on the Mesabi Range. U. S. Steel's large Minntac plant is located on the ridge northwest of the city, and the city itself is surrounded by mines and dumps.

Field observation coupled with careful examination of the topography as depicted by contour lines on Map 1 indicate that with two exceptions the facilities are so sited that they will not be readily visible from any point of public usage or habitation and therefore should not detract from the scenic beauty of the area.

The exception is the Ordean-Allan Pit which would be visible from 17th Avenue North in the City of Virginia and from the relocated Business Route of Truck Highways 53 and 169. In the event that the rail spur serving the plant site is connected to the Duluth, Winnipeg and Pacific Railway mainline, the Ordean-Allan Open Pit would also be visible from the by-pass route of Trunk Highway 53 and 169. Rail service from either the Burlington Northern or the Duluth Missabe and Iron Range track systems would require the construction of a railroad fill parallel to but higher than the by-pass route. The grassy slopes of this fill would then provide an effective screen for the open pit. If the rail spur is not connected, Inland will plant trees along the highway to screen the view.

In summary, any mining operations are certain to have severe adverse effects on the natural beauty and aesthetic qualities of the area. Mining companies are recently more sensitive of the need to minimize these effects and it is felt that they will increasingly find it in their interest to do so.

J. Historical Sites

The St. Louis County Historical Society publication, "Exploring St. Louis County Historical Sites," by Charles E. Aguar, 1971, and the Minnesota Department of Natural Resources, Bureau of Planning booklet, "Natural and Historical Areas of Minnesota," September 1971, both show no historical sites as being in the proposed project area. There is no known archaeological significance that is presently listed in the National Register of Historic Places. Nor are there any now candidated for the National Register as defined by the National Historic Preservation Act of October 15, 1966 and Executive Order 11593.

III. UNAVOIDABLE ADVERSE IMPACTS

A. Reduction in Wildlife Habitat

The amount of habitat available to wildlife would be reduced by 5,517 acres through the operational period. Destruction would be far from total, however, and residual populations would re-invade the disturbed areas as they become revegetated. Vegetative types would be significantly changed in the tailings basin and waste disposal areas, and this would have an effect on wildlife populations in these areas. Until they again become forested, certain species might find the new vegetative types untenable. These areas can be rehabilitated, however, and in time would again be productive wildlife habitat for most of the same species. During the revegetative period, open upland habitat which is relatively scarce in the project area at present undoubtedly would be favored. The effects of habitat changes on the large mobile species would be much less drastic.

The mine pits would probably be a net habitat loss unless waste rock was utilized for shoal area development. Although they would undoubtedly fill with water, the steep banks and expected infertility of the water might preclude their management for fish. The chances of their becoming waterfowl rest areas would also be remote.

Nearly eight miles (three to four surface acres) of narrow, headwater streams would be lost, along with the minnow, dace and chub populations which exist in them. These streams will be reestablished when the operation is complete, but the downstream portions of the streams are not expected to be adversely affected, physically, chemically or biologically.

Some of the disturbance should be favorable to deer and grouse through removal of the timber overstory which ultimately would permit growth of herbaceous and browse species. In some areas this would also be favorable to snowshoe hare and other small mammals. In turn, predatory species, both mammals and birds, would be benefited.

Standing water in the settling basins and the clearwater pool would provide potential resting and feeding places for waterfowl where none now exist. Favorable habitat for shore birds also may develop and these species would be much more common in the area than at present. Management of the clearwater pool area and possibly the waste disposal area for geese would probably only benefit migrants.

B. Groundwater

Continued lowering of groundwater tables due to mining below aquifers may deplete the groundwater resource while the pits are being pumped. This has, however, not been a serious problem in the past and is suspected to pose no such problem here.

C. Loss of Timber Producing Base

Although timber salvage operations are presently underway in the site, about 5,000 acres of land will be lost partially or completely for the production of timber in the future. It is possible, that with proper reclamation, the tailings basin could sustain a harvestable timber crop in the future. However, the pit and waste disposal area will be unable to support any commercial timber operation in the future.

D. Reduction in Recreational Use

For the protection of its employees and to safeguard the public, Inland Steel must, of necessity, fence off its open pits and prohibit hunting and/or trespassing on certain of the lands in the project area. As a direct result, use of the area for hunting, hiking and snowmobiling would be drastically curtailed during the life of the operation. After the life of the operation, an open pit hazard will exist.

The heavily used Laurentian snowmobile trail is now located within the planned tailings basin area. Inland intends to relocate this trail around the north side of the tailings basin and make it available to the public. The realignment of the trail would be selected in the field to permit its development through the more

scenic areas that would also provide either forest cover or terrain that would screen the tailings basin from view.

E. Adverse Impact of Blasting Operations

Mining of taconite would not be possible if the material could not be fragmented by blasting with explosives. However, this one facet of the operation in all probability has the greatest adverse effect on the environment. These adverse effects stem from the noise, the seismic shock wave, air blast, fly rock and air pollution by fumes and airborne solids. Technological improvements and enhanced knowledge would serve to minimize all of these adverse effects but cannot completely eliminate them. The technological improvements extend to new explosives and delay mechanisms whereby the effect of the ground shock wave, or seismic wave, would be dampened by creating a series of waves by successive explosions at micro-second intervals. Experience has proven that damages due to air shock would be minimized or frequently be eliminated by blasting only under favorable weather conditions. The noise would be reduced but not eliminated by covering primacord and stemming of blast holes. The throw of fly rock would also be reduced through stemming of the blast holes with properly sized material. The air pollution by dust and fumes from blasting cannot be eliminated. However, the blasts would be timed to coincide with favorable wind and weather conditions that would carry the pollution into uninhabited areas where it would disperse.

In the event that the aforementioned railroad spur will not be built, Inland has agreed to plant trees along the areas where the mining operation is visible to the public. The screen of trees will reduce the aesthetic impact as well as reduce some of the noise pollution from blasting.

F. Aesthetic Impact

The Laurentian Divide is a prominent relief feature in northern Minnesota. The divide presently shows the scars of past mining operations both from the ground and in the air. Although the remains of mining leave interesting

historical evidence, they are nonetheless nonconforming to the general landscape of the area.

Efforts to establish natural vegetative barriers would significantly improve aesthetic values from the ground level view. Reclamation of coarse tailings ponds, structural dikes, abandoned plant sites and stock piles would likewise enhance the scenic beauty of the area from the ground and air. In addition, the area would blend with the natural surroundings much more quickly than without reclamation efforts. Reclamation efforts will proceed as required by state law.

IV. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Inland Steel's proposed operation will serve to deplete the minable magnetite taconite crude ores lying within those mineral lands leased by Inland on the iron formation north of the City of Virginia. Beneficiation of these crude ores will produce high grade oxide pellets for reduction to hot metal in iron and steel making facilities at Indiana Harbor.

The lean ores encountered in the mining operation that are not now amenable to beneficiation processes will be placed in stockpile in such a manner that they can be reclaimed and processed for recovery of the contained iron when and if such a commercial process is developed.

Construction materials, mobile and fixed equipment, mine and mill supplies, and human effort utilized in the construction and operation of the proposed project is initiated.

Other irreversible commitments include the land that will be utilized for storage reservoirs, waste disposal areas and open pits. It is probable that the land committed to these uses will not be returned to its original state and use.

V. THE RELATIONSHIP BETWEEN LOCAL SHORT TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The relationship between local short-term use and the maintenance and enhancement of long-term productivity of the lands involved in this proposal is difficult to define.

Inland Steel Company's proposed use of the land would occur over a considerable period of time. They have ore reserves enough to produce 100 million tons of taconite pellets, which, at the design capacity of their plant of 2.3 million tons annually, would last for 43 years. Acquisition of more ore reserves or use of lower grade ores could well extend the plant life to over 60 years. During this period the lands being used for waste rock and tailings disposal would not be directly productive, but would be supporting a productive and economically highly valuable taconite iron ore plant. At the end of the life of the taconite plant, these waste disposal lands will be returned to some type of production of forest vegetation and animals. The waste rock piles will not have a good forest cover for many generations unless extremely intensive rehabilitation is undertaken. The tailings, being fine textured material conducive to soil formation, will become fairly good quality and productive land with intensive rehabilitation. Exactly what use would be made of these lands in the future is impossible to predict.

At the present time, State, National Forest and adjacent lands involved are wild, undeveloped forest land. On Giant's Ridge, slopes are steep, rock outcrops common, and soils coarse and shallow. To the north, the topography is gentler, soils are generally shallow, rocky to fine textured, many poorly drained. None of the area is considered good quality forest sites. The land is currently producing generally low value pulpwood timber, the usual forest wildlife, watershed protection, recreational and aesthetic amenities for the public. If not used for mining, this land could be expected to remain in its present status through the foreseeable future.

A. Future Reclamation

The reclamation that will be carried out at this mining operation is difficult to accurately predict at this time. Extensive mineland reclamation rules and regulations are being developed presently by the Minnesota Department of Natural Resources. When such rules are adopted as law, Inland Steel will manage their operation to meet the state requirements.

In the interim, Inland Steel is planning on committing personnel to a reclamation program and will actively pursue research and implementation of reclamation methods. Several agencies such as the Minnesota Department of Natural Resources, the Agronomy and Forestry Schools of the University of Minnesota, the Soils Conservation Service and the U. S. Forest Service could be requested by Inland Steel to add expertise in pertinent areas to reclamation research and plans. Inland Steel will also develop a reclamation timetable once. the state mining rules and regulations have been developed.

Inland Steel began a reclamation program at its Black River Falls Plant in 1970, its first year of operation. The situation is somewhat similar at both locations because there is no significant amount of topsoil present. Through fertilization and planting of grass and trees, approximately 40 acres of disturbed land have been reclaimed. Inland Steel will develop an expanded reclamation program for its plant at Virginia as they gain more experience in successful techniques.

The areas affected by mining fall into four classes; the actual plant and facilities, the mine pits, waste rock piles, and tailings basins.

1. A taconite plant is a huge complex of buildings, machinery, storage areas, roads, and railroads. These plants can be expected to continue in operation as long as the ore reserves last. Even if taconite is eventually mined underground, the ore may be hauled to these plants. Final abandonment of the plants is far in the future, possibly 50 to 100 years. It is expected that the facilities would be removed under State or local regulations at that time.
2. The mine pits will eventually be abandoned when the ore bodies are exhausted. Little can be done actively to rehabilitate these. A few may be partially filled with mining waste. Some will fill with water; others that are high on the Divide will probably only partially fill, if at all. Those that do fill should be good lakes for water supply and - in some cases - for recreational use. Older portions of the huge open pit mine north of Hibbing are becoming revegetated, at least on benches, so these pits will not remain completely with a raw appearance.
3. Waste rock dumps or stockpiles fall into two categories - (1) glacial till and rock overburden, and (2) iron-bearing rock of too low iron content or nonmagnetic form that cannot now be utilized. The lean ore and nonmagnetic taconite will almost certainly be eventually utilized. The mining companies are reluctant to go to much expense to rehabilitate these stockpiles knowing they will be re-mined in the future.

   The nonmineralized dumps will remain. They could be moved and deposited in the completely exhausted pits, but with many million tons of material this would be a tremendous and expensive undertaking.

The dumps have steep sides at the angle of repose, and it has been suggested that these slopes be rounded off to allow access when they are finally revegetated. Making the slopes less steep, however, would make the dumps cover even more area. Access "ramps" at points around the sides of the dumps have been suggested as the answer.

Revegetation of these piles is difficult as they are composed mainly of rock. Those with sufficient soil or fines mixed in do have natural aspen, birch and weeds becoming established. Planting is very difficult due to the rockiness and moisture problems. Screening and planting of the waste piles to minimize their visual impact is being attempted, not always very successfully. At the very best, screening plantings will take several years to reach effective size and density. Part of Inland's reclamation effort will be in this area.

4. Tailings Basins, due to the fineness of the material, are easily erodible. In addition, the tailings are a sterile material. However, with application of proper fertilization and mulch, vegetation can be established without great difficulty. Erie Mining Company, for example, has on an experimental basis established a good sod cover of grass and legumes on the steep slopes of their tailings basin. One small, inactive basin has been stabilized with grasses and legumes and various trees and shrubs planted. Low plants with dense root systems are necessary to stabilize the fine material, and legumes are desirable to reduce the need for subsequent fertilization. The finely ground tailings have great surface area and therefore, weather rapidly, facilitating the formation of soil. Some natural revegetation has occurred on old basins along with planted material.

Inland Steel is able and willing to revegetate their tailings to stop erosion and washouts of dam sites, and to control dust with temporary and permanent plantings in the basin itself. Complete and inactive

parts of the basins will be permanently stabilized so that drainage no longer needs to be part of the closed system of the tailings basin. This could be important, as rainfall over the very large basins could result in an excess of water in the closed system which could be returned to the natural drainage.

At the final completion of the tailings basins, there will be large, gently sloping basins most likely with a shallow lake in the center and the tailings should be well stabilized with herbaceous vegetation. They could be used for grazing lands or could be forested. Deer have been observed in stabilized portions of the tailings basins and geese have recently been seen using Erie's basin during the fall migration.

5. Dam Rehabilitation

The side slopes of the dam will be vegetated to blend into the landscape and provide wildlife habitat. As such, the erosion will be reduced from this site. Inland plans to at least comply with state reclamation regulations when they are implemented, as a minimum.

B. Wildlife

Insofar as wildlife is concerned, the necessary destruction of the habitat for the taconite operation may be a "blessing in disguise" in the long run. However, much habitat will be lost for 40--60 years. From the long-term standpoint, the conclusion of the operation will present opportunities to rehabilitate substantial portions of the disturbed area and to manage these areas for wildlife. Inland Steel will cooperate in the initial preparation of the project area for this purpose if a responsible governmental agency is available to plan, maintain and further develop the area.

Management for geese and other waterfowl appears to present the best possibility. To facilitate this, a thousand or so acres of the tailings basin abutting the clearwater pool could be planted to a suitable forage crop. Thereafter, the encroachment of brush and trees could be controlled by regular harvesting of the crops or by burning. This forage area and the adjacent clearwater pool should provide an attractive stopover point for migrating geese and could be managed either as a refuge or a public hunting area. The portion of the tailings basin not utilized for this purpose could be planted to a commercially important tree species.

The waste disposal area presents wildlife management opportunities similar to those of the tailings basin and can be handled in much the same manner. A substantial portion could also be vegetated with a suitable forage crop as an adjunct to the "goose pasture" in the tailings basin. Conceivably, one area could be managed as a refuge and the other as a hunting area if the situation is conducive to this type of management.

The plant site and Sauntry Creek settling basins present a less predictable situation since it is difficult to estimate what their depth and bottom configurations will be at the close of operations. It is doubtful, however, that they will be suitable for fish management purposes. Any possible use for waterfowl management probably would require dumping of fine material in a portion of each basin to provide shoal areas necessary for the growth of aquatic plants. As in the case of the tailings basin and the waste disposal areas, however, the company will cooperate with any responsible governmental agency that desires to plan, develop and maintain the area for fisheries or wildlife purposes.

VI. ALTERNATES TO THE PROPOSED ACTION

As heretofore stated, Inland Steel deems that the proposed taconite operation in the Virginia area would be a suitable and desirable replacement for its largest present source of ore, the Caland Ore Company Limited's operation in Ontario, the reserves of which will be economically exhausted by 1978. In the event that the Inland is denied the right to appropriate and make consumptive use of water for the production of taconite pellets on the Mesabi Range as a replacement for the natural ores of the Caland reserve because of seemingly adverse impact on the environment, it must resort to one of the following alternatives:

A. Exploitation of its reserve of magnetite taconites in the Virginia area by an alternate plan of operation involving less adverse impact on the local environment.

B. Abandonment of this reserve and development of another source of metallics.

C. Reduction of its iron and steel making capacity to a production level commensurate with its reduced supply of raw materials following economic depletion of its Caland reserve in 1978.

In its studies preceding and during the development of the operating plans for the taconite operation at Virginia, Minnesota, Inland did consider each of the alternative sources of action described above - ruling out each of the alternates in turn by comparison of those alternatives with the economic and inherent advantages of the proposed plan.

To elaborate, the essential "ingredients" of a taconite operation are:

1. A minable reserve of crude ores which is amenable to beneficiation by commercially proven methods and is of sufficient magnitude to justify the multi-million dollar investment for its exploitation.

2. An adequate site in the immediate vicinity for disposal of solid waste from mining.
3. A suitable area proximate to the ore reserve for the plants and ancillary facilities that is readily accessible from existing rail and highway systems.
4. A large area for disposal of plant waste within reasonable distance of the plant site.
5. An assured source of process water adequate to meet plant demands.
6. A staff of skilled and semi-skilled workers with domiciliary and service facilities within reasonable commuting distance.
7. A guaranteed long-term market for its product.

If all of the above conditions can be met and combined in such a manner that the resultant operation will yield a profit to the developer, the operation is "viable". With these conditions in mind, let us examine the feasibility of the alternatives to the planned Virginia taconite operation.

- Alternate A -

If the reserve of magnetite taconite in the Virginia area is to be mined, the only way that Inland could lessen the impact on the local environment would be to separate the mining and beneficiation phases of the operation. Mining of the taconite would still create the Minorca and Ordean-Allan pits; disposal of the solid wastes from mining would, in all probability, involve virtually the same area in the waste disposal site; and facilities for repair and maintenance, supervision, and coarse crushing and shipment of the crude ores would involve basically the same area currently planned for the plant site. The only area not affected by the change in plan would be the disposal site for both coarse and fine tailings that would be created in the concentrate operation and the sites for the facilities for appropriation and storage of process waters. These

facilities would then have to be provided at an alternate site.

The alternate proposals considered for tailings disposal are discussed below.

- Alternate A-1 -

Movement of the proposed tailings basin to the west about one mile was discussed by an Inland representative and the DNR. The purpose of this DNR proposed alternate was to maintain a natural low flow condition in Wouri Creek. Inland Steel voiced two objections to this proposal in additon to the usual economic considerations. The nature of the property holdings in this area has not been explored. Since Inland has already consummated a land exchange with the Forest Service for the present basin site, they are reluctant to move the basin. In addition, the proposed tailings basin is now well located in relation to Highway 169. Inland feels a westerly movement of the tailings basin would make visible to travelers along the highway. The DNR feels that the dam site would have to be within ¼ to ½ mile of the highway to be visible. However, Inland has agreed to establish a stream gaging station on Wouri Creek and to supplement flows to maintain a minimum flow of 0.5 cfs below the tailings basin dam. Thus, this alternative is probably only second best to the present proposed site.

- Alternate A-2 -

Inland explored the possibility of locating the tailings basin north of Highway 169. This site necessitated the construction of a dike type dam with several outlet spigots for discharge of tailings. Such a dam is not impervious and is much more subject to failure than the present proposal. The water ponded in the middle of this dam can not exceed the height of the berm. Thus, the berm must constantly be raised as the tailings basin fills. In additon to these construction problems, Inland feels homes now in this area would be devalued by this

alternate. Also, airborne solids from the tailings basin would be carried to the SE, where they would be noticed more frequently than at the present proposed site.

- Alternate A-3 -

Another site south of Virginia was examined. This site would again necessitate the dike type construction. As mentioned above, construction problems render this a poor alternative. In addition, the total land area involved would be greater than the present land area at the proposed site. Reclamation of the tailings basin here would be more difficult since the location of overburden, which may be used for reclamation, is further away.

- Alternate A-4 -

Inland Steel and the DNR discussed the possibility of using existing pits to dispose of tailings. To do this, ore would have to be mined out of present pits that can not be economically processed today. Until the technology or a market for such ore exists, it can not be mined. To bury such deposits by tailings today may be an unwise move in the future. Thus, this is a less desirable alternative.

- Alternate A-5 -

The possibility of combining tailings basins with another mining operation was discussed. Inland Steel felt that at this time such a proposal was not feasible. One of the major concerns was the problem of water appropriation. The DNR feels that regional land use planning to optimize the use of the land, will necessitate combined tailings basins in the future.

The proposed plant site settling basin was a topic of much concern to DNR. Inland Steel proposes to allow discharge from this basin to enter Laurentian Creek, a designated trout stream. This discharge would increase the natural flow by about four times its present flow. Such discharge would probably contain

sewage effluent from the plant site, grease and oil contaminants and other undetermined sources of pollution should the plant "go down". Because of the adverse effects on Laurentian Creek, the DNR will not allow the proposed discharge from the plant site settling basin to enter the creek. Inland has proposed an alternate solution. Inland did discuss the establishment of a diversion for natural watershed runoff. The water in this basin may also be pumped to storage tanks on the site. DNR will require Inland Steel to take all appropriate measures to protect Laurentian Creek.

Some alternatives for stockpiles were discussed. It is the understanding of the DNR that a market for coarse tailings exist in the Twin Cities. To market the coarse tailings would reduce the amount of land area now used for stockpiling and reduce the amount of reclamation. Inland Steel, however, utilizes some of the coarse tailings in dam construction, road subgrades and road aggregate. Inland indicated that they would prefer to reclaim their coarse stockpiles to state reclamation standards until a better market is available.

Stockpiling of overburden for reuse in reclamation was discussed. Inland said that if the state requires overburden to be used in reclamation, they will comply. Inland will have an on-going research program in mine reclamation at this site.

- Alternate B -

Inland has already expended monies, time and effort in the negotiation for and acquisition of mineral leases in the Virginia area and of surface lands adjacent thereto for the proposed taconite operation. It has thoroughly explored the reserve, purchased aerial photogrammetric surveys, conducted soils

studies and ground surveys, evaluated alternates, developed general arrangement plans for the facility, and contracted for the detailed design. Inland could, of course, abandon its plans for the Virginia taconite operation and obtain its requirement for additional metallics from other sources. There is no current shortage of iron ore. In fact Inland is constantly seeking economic means to improve the quality of its raw materials to produce a more competitive finished product and has closed down a number of its natural ore mines to obtain additional pellet production. Various companies in the iron ore mining field in the United States, Canada, South America, Africa and Australia would be most pleased to have Inland's participation in their joint ventures for that participation would serve as a guaranteed outlet for their pellet production. Purchase of ores on the open market under a long-term contract, or participation in a joint venture with its concurrent obligations to accept a specified tonnage of ore regardless of economic conditions, could at times create a real problem for Inland. Full control of an integrated mining operation such as is planned for the Virginia area would permit Inland to relate its production of iron ores to the then current demand for metallics at a lesser cost than would be involved in either a purchase or joint venture arrangement.

- Alternate C -

In the event that Inland were to curtail its production of iron and steel, it must, of necessity, "moth ball" or raze a portion of its present Indiana Harbor facility and reduce its work force. Such action on Inland's part would increase its cost due to volume effect, make its product less desirable in a highly competitive market, and create a hardship on the populace of that local environment.

These studies and considerations have convinced Inland that, all things considered, there is no desirable alternate to the Virginia taconite operation.

Loss of the project would mean resultant loss of jobs and the salaries therefrom; loss of income from purchased services and supplies; loss of tax revenues to the federal, state and local governments; and loss of ore concentrates for steel manufacture. This could have a definite adverse effect on local economic structures and direct employment levels. Secondarily, it would have an impact on supporting enterprises and services and those employed in them. It could cause an increased burden in social welfare and a need to find other employment or to move families to areas where jobs are available.

VII. THE IMPACT ON STATE GOVERNMENT OF ANY FEDERAL CONTROLS ASSOCIATED WITH THE PROPOSED ACTION

At this time, the state has responsibility for the enforcement of OSHA regulations in the concentrator portion of the plant. The state also enforces federal air and water quality standards. Other than this, no other impacts are known to exist.

VIII. THE MULTI-STATE RESPONSIBILITIES ASSOCIATED WITH THE PROPOSED ACTION

There are no expected multi-state environmental impacts to result from this action. The potential for possible water pollution to occur in the Lake of the Woods drainage basin did exist under the original proposal for the plant site settling basin. However, the DNR will not allow discharge from this basin to enter Laurentian Creek since it was expected to change the aquatic environment of the creek. Inland Steel has proposed an alternate solution to this problem, allowing for no discharge into Laurentian Creek.

The production of this taconite will provide employment for the steel making industry and related industries in other states. The normal state responsibilities associated with this employment are the only ones known to be associated with this proposed action.

IX. SUMMARY OF HEARING, COMMENTS AND REPLIES

Summary of Draft EIS Hearing Held on January 24, 1974

The hearing on the water appropriation permit and the Draft EIS was held in Virginia on January 24, 1974. The Department of Natural Resources began by summarizing the text of the environmental impact statement. There were no questions pertaining to the statement from the audience. However, some comments were made and are summarized below by individual:

Witness:

Alan T. Broderick - employee of Inland Steel.

Mr. Broderick's comments were relative to research on the presence of the so-called amphiboles grunerite - cummingtonite which contain asbestos type material. Eight thin sections were analyzed from the site. The minerals Stilpnomelane, Minnesotaite and Greenalite were found in these samples. Mr. Broderick indicates these minerals are generally found West of the Mesabi and the so-called amphiboles of grunerite - cummingtonite and higher temperature minerals are found East of the Mesabi. The transition zone to the amphiboles occurs some 15 miles east of the project area. This analysis conforms with work of other people who have studied the features in the merchantable ore portion of the range.

Response:

None.

Witness:

John C. Appleget - retired fisheries biologist, formerly with Bureau of Sport Fisheries and Wildlife.

Mr. Appleget testified that he has witnessed abandoned black top roads reverting back to a vegetative state. He also claimed the turbid condition possible from sedimentary discharge allowed to enter the stream from the plant would have little, if any, effect on fish life as far downstream as the Pike or Sandy Rivers.

Response:

Thorne (state attorney) suggested the record to show portions of the Draft EIS quoted by Appleget, be carried over to the Final EIS.

Witness:

Samuel A. Reipas - employee of Inland Steel.

Mr. Reipas discussed the steps proposed by Inland Steel to protect the three creeks affected by the project. He indicated Inland would be willing to establish a stream gauging station on Wouri Creek to determine flow rates. If DNR and Inland agree that low flow augmentation is necessary after the tailings basin has been constructed, Inland would release the required water from the clear water pool in the tailings basin.

Mr. Reipas stated Inland does not feel that the proposed operation would add any sedimentary discharge to Laurentian Creek. Inland would be willing to establish a stream gauging station on the stream and would take additional steps to protect the stream if the operation is adversely affecting the trout population. (Since this hearing, Inland has changed their plant facility design and no discharge from any mining related activities will occur in Laurentian Creek.)

Sauntry Creek was described including the flood flow diversion during March 15 to June 15, which would take flows in excess of 1.2 cubic feet per second per square mile of drainage area. Inland will establish stream gauging stations on Sauntry Creek to monitor flow rates to determine release and diversion of water in this creek.

Response:

Thorne (state attorney) questioned Reipas about undesirable discharge from the plant and alternatives to solve the problem. Mr. Reipas did testify it was possible to eliminate discharge into Laurentian Creek.

Lejcher (state hydrologist) questioned Reipas concerning Inland's desire to demonstrate an impact on Laurentian Creek before a change in plant design was required. Reipas indicated if sufficient literature evidence pertaining to adverse impacts to the stream were demonstrated, such evidence would be acceptable, as opposed to actually demonstrating unfavorable effects on the creek due to the mining operation.

Witness:

Weston Fisher - Minnesota Pollution Control Agency.

(Full text of statement included)

Response:

Herbst (Minnesota Department of Natural Resources Commissioner) asked for PCA assistance on the final EIS. Thorne (state attorney) stated that the DNR is drafting land mine reclamation regulations to be promulgated by the Commissioner of DNR by July 1, 1974. Such regulations will require filing of a reclamation plan. Lejcher (state hydrologist) and Herbst questioned Fisher regarding monitoring. Fisher testified it was the responsibility of the PCA to monitor.

Pearsall (Virginia Mayor) commented one of the biggest problems facing the City of Virginia is finding adequate housing. The city council, school board and mining companies in the area are working together to solve the problem. Johnson (Chamber of Commerce) stated that a total of 320 acres of residential property existed in the area. The city council is letting bids for a new sewage treatment plant facility which will enable Virginia to be one of the first cities in Minnesota to comply with PCA regulations. Presently there are at least two empty school buildings in the city also. Phillips (township board of supervisors) commented the creeks in question were dry about 50 percent of the time and wondered how fish could live in them.

STATEMENT OF WESTON FISHER

DIVISION OF SPECIAL SERVICES

MINNESOTA POLLUTION CONTROL AGENCY

ON

THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR THE

PROPOSED TACONITE OPERATION

BY INLAND STEEL IN

ST. LOUIS COUNTY, MINNESOTA

JANUARY 24, 1974

Virginia, Minnesota

My name is Weston Fisher. I am a Research Scientist with the Division of Special Services, Minnesota Pollution Control Agency. Thank you for the opportunity to present testimony on the draft environmental impact statement for the proposed Inland Steel taconite operation. I would like to preface my remarks by stating that due to the limited time we have had to review the draft impact statement I will comment only on those areas of the draft EIS where major deficiencies appear to exist. We may wish to submit further written testimony at a later date. As this is the first EIS under the new state EIS requirements of Minn. Laws 1973, Chapter 412, the preparation of this report serves as a precedent for future environmental impact statements on major public or private actions in Minnesota. For this reason, and because this is a major action with significant impact on the environment, it is important that this report be prepared as carefully as possible. I hope, therefore, that my comments on this draft will be regarded as positive suggestions for areas in which the EIS can be strengthened.

I believe the most serious deficiency in the present impact statement is the failure to provide in clear fashion the materials and resource balances for the proposed taconite operation. In order to assess the environmental impact of this operation, I would suggest that resource balances for daily operation be provided including:

-crude ore processed
-water appropriated (both ground and surface water)
-energy requirements
-labor requirements

-tons of taconite pellets produced
-gallons of water discharged
-pounds of mineral contaminants discharged to public waters
--tons of air contaminants released
-tons of tailings produced
-tons of waste rock produced

In addition, the land and water requirements should be consolidated from the various sections of the draft EIS and presented in a much clearer fashion, perhaps in a manner similar to that in the Inter-Agency Task Force Report on Base-Metal Mining.

Another major deficiency is the absence of a reclamation plan in the draft EIS for the area affected. The company should make a committment to a definite program and time schedule for the reclamation program, outlining the extent to which reclamation will occur, and the cost of such reclamation. The extent of the committment required by law should also be provided. In addition to filling these two major gaps in the draft EIS, I would like to offer the following suggestions:

Under the section entitled Description of the Environmental Setting, Description and Background of the Sub-Region, the statement on imported iron ores and their impact on balance-of payments should be contrasted with the alternative argument of leaving the resource in the ground for future use, and making up the difference through a metals conservation program.

Under the section entitled Description of the Environmental Setting, Economic Impact of the Proposed Project, it is stated that "substantial new housing developments will be needed between 1974 and 1984," and the "proliferation of mobile home parks is the most predictable development which might occur." The impact

of a development of this type should be examined in much greater detail, including an examination of requirements for water appropriation and sewage treatment, particularly when it is stated that "the City of Virginia cannot absorb any substantial growth." The impact of this development on other public services and institutions such as schools, hospitals, etc. should also be examined, and alternatives to mobile home development should be given greater consideration.

The statement is made in this section that by far the most significant impact of the proposed operation on the environment will be its effects on the area economy. There is no data to support this statement.

Under the section on Wildlife the ecological study seems to be inadequate to assess potential impact. Statements such as "Wouri Creek is a small, flowing stream reportedly containing minnows" suggest no study at all. Various statements such as these were used to describe the resources in the area of the proposed plant.

The draft EIS also states in this section that the population of fur-bearers in the area is unknown." How then can it be said that the habitat "loss will have a noticeable effect on the present population?"

Under the section entitled Water, it is stated that if installation of three wells for emergency groundwater were to have an adverse effect upon the productive capacity of the City of Virginia well, Inland "shall take such remedial action as necessary to eliminate and effectively minimize the effect of its

operation on others," and that Inland will perform pumping tests to try to ascertain in advance what impact these wells will have on the Virginia standby water source. The final EIS should contain more detailed discussion of the potential effects, a plan for monitoring of these effects, and a clear indication of the type of remedial action Inland will take should the tests or future monitoring show that adverse effects will occur.

What impact will damming the outlets to Manganika and Mashkenode Lakes have? There is no mention of these streams. An assessment of the natural communities in these streams should be made and the data provided.

This section also states that "mine waste dumps and tailings have very little effect on the quality of the water resource. The taconite and overburden rock itself is relatively inert and does not result in acidifying water flowing from the dumps." This should be backed up with test results, not only of pH but also turbidity and suspended solids.

Under Aquatic Habitat the EIS states that "the beaver dam acts as a barrier to fish migration" and that "no fish species have been observed" in this reach of the stream. Collection data should be provided to substantiate these statements. The basis for the determination that the elimination of six miles of Wouri Creek would not effect the flow in the immediate downstream area should also be provided, and also for the statement that underground seepage will replace water loss. The statement that no fish have moved upstream into the project area needs to be substantiated as well as a description of the type of water sampling

that was employed in reaching the conclusion that fish populations are absent.

A monitoring plan should be provided to assure that no discharges from the plant into Laurentian Creek "alter the physical, chemical, and/or biological nature of those waters."

Again the basis for the conclusion that no fish exist in Sauntry Creek near the project site should be provided.

In the section entitled Timber the statment is made that at "least one of the mining companies has a multiple use management plan for all of its properties." The EIS should state whether such a plan will be followed by Inland, and if so, provide a description of the plan.

Under the section entitled Air a more detailed analysis of the potential problem and the basis for the proposed solution is needed.

Generally, inadequate attention has been paid in the draft EIS to the problems of monitoring to determine if ecological damage is occuring from air or water discharges. Nor has attention been given to the need for pre-operational monitoring to establish baseline data for future comparison with operating conditions. Without the baseline data it may be difficult to determine the nature of future ecological change in the mining area.

Finally, a much more complete description of meteorological and hydrological conditions is needed. The discussion of problems of seasonal water availability should be presented in a clearer fashion and attention should be paid to the impact of water appropriation for the Inland taconite operation on other possible

uses, including the extent to which it might affect water appropriation for the alternative of on-land disposal of Reserve mining.

That concludes my statement.

Herbst stated written comments and statements would be accepted before or on February 15, 1974, and adjourned the hearing.

WRITTEN COMMENTS AND RESPONSE

Copies of all written comments are included below. Response to these comments will be found as follows:

Agency Commenting	Response
Minnesota Department of Highways	page no. 26
Minnesota Power and Light Company	None required
Potlatch	None required
Wisconsin Department of Natural Resources	Copy sent
Bureau of Outdoor Recreation	Copy sent
Environmental Protection Agency	Included response
Minnesota Pollution Control Agency	47-50 63-67 36-42 32, 40, 46 Included response
Izaak Walton League of America	None required
United States Steel	None Required
Project Environment	Review appropriate sections in final EIS
Inland Steel	None required
Minnesota Department of Natural Resources Division of Parks and Recreation	43-44 23-30

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
ST. PAUL, MINN. 55155

January 24, 1974

Mr. Robert L. Herbst, Commissioner
Minnesota Department of Natural Resources
Centennial Office Building
St. Paul, Minnesota 55155

In reply refer to: 330
Draft Environmental Statement for
the Proposed Taconite Operation
by Inland Steel in St. Louis County

Dear Mr. Herbst:

We have reviewed the above Draft Environmental Impact Statement as it relates to our area of jurisdiction and offer the following comments.

In reviewing the statement it was noted that there was no discussion of external traffic considerations. We feel that should a facility such as is being proposed be constructed, it will have significant effects on existing and proposed transportation corridors and highways.

We believe the final statement should address the effects the proposed facility will have on the Local, County and State highways in the area of Virginia.

1. Discuss the location and type of access that will be provided to the facility from existing roads and highways.

2. What are the anticipated peak and average daily traffic volumes that will be generated by the construction of this facility? What percentage of this traffic volume will be heavy commercial vehicles?

3. What are the anticipated effects of the additional traffic (generated by the facility) on the existing Local, County and State highways?

4. It appears that County Road 53 (9th Avenue) will be obliterated north of the Virginia City Limits, what effect will this have on the City and traffic patterns? If Inland Steel proposes to re-connect the County Road with the expressway, how will this re-connection be accomplished? By whom?

5. What effects will the proposed railroad fill parallel to the highway have on the highway and on highway drainage?

Thank you for giving us the opportunity to provide these comments which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,

Ray Lappegaard
Commissioner

Here

MINNESOTA POWER & LIGHT COMPANY
30 WEST SUPERIOR STREET, DULUTH, MINNESOTA 55802
PHONE (AREA 218) 722-2641

JOHN F. McGRATH
VICE PRESIDENT—ADMINISTRATIVE AND SECRETARY

January 28, 1974

Mr. Robert L. Herbst
Commissioner of Natural Resources
Centennial Office Building
St. Paul, Minnesota 55155

Division of Waters Soils & Minerals

Dear Mr. Herbst:

With reference to the application of Inland Steel Company to use water for their proposed taconite plant near Virginia, Minnesota, which application is dated May 15, 1973 and to which a public hearing was held at Virginia, Minnesota on January 24, 1974, I wish to advise that Minnesota Power & Light Company has an understanding with the applicant that the granting of a permit pursuant to said application shall, as between said companies, be without prejudice to the right of Minnesota Power & Light Company at a later date to claim that it has been damaged by the applicant's appropriation of water pursuant to the permit and without prejudice to the applicant's right to contest any such claim. At this preliminary stage of engineering it has not been possible to form any definite conclusions.

Minnesota Power & Light Company has no objection to the grant of a permit pursuant to said application.

Yours very truly,

John F. McGrath

John F. McGrath

JFMcG:es

Richard C. Nordholm
Vice President, Northwest
Paper Division, Paper Group

Potlatch Corporation

Avenue C & Arch Street
Cloquet, Minnesota 55720
Telephone (218) 879 6784

January 29, 1974

Mr. Robert Herbst, Commissioner
Department of Natural Resources
State of Minnesota
Centennial Office Building
St. Paul, Minnesota

Dear Commissioner Herbst:

This is in reference to the application of Inland Steel Company for permit to appropriate and consume water from the headwaters of the St. Louis River in St. Louis County, the hearing of which was held on January 24, 1974, in Virginia, Minnesota.

Potlatch Corporation, Northwest Paper Division, a utilizer of the waters of the St. Louis River at Cloquet, Minnesota, after examining the aforesaid application and papers amendatory thereto, has no objection to the proposed permit and to the consumptive use of water from the headwaters of the St. Louis River by Inland Steel Company. This position is based upon the economic benefits of the proposed development by Inland, the high degree of "closure" in their water use system, and the relatively little effect of their operation on the quality of the water resource.

If you have any questions regarding the position of Potlatch Corporation, Northwest Paper Division, please feel free to call on me.

Sincerely,

Gene

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

L. P. Voigt
Secretary

BOX 450
MADISON, WISCONSIN 53701

January 30, 1974

IN REPLY REFER TO: 1600

Mr. Robert L. Herbst, Commissioner
Minnesota Department of Natural Resources
Centennial Office Building
St. Paul, Minnesota 55155

Dear Mr. Herbst:

I understand that the Minnesota Department of Natural Resources has recently prepared a draft Environmental Impact Statement for Inland Steel's proposed taconite plant near Virginia, Minnesota. If copies are available, I would greatly appreciate a copy for our Department files.

Thank you for consideration of our request for this draft statement.

Very truly yours,
Bureau of Environmental Impact

C D Besadny

C. D. Besadny
Director

CDB:mr

United States Department of the Interior

BUREAU OF OUTDOOR RECREATION
LAKE CENTRAL REGION
3853 RESEARCH PARK DRIVE
ANN ARBOR, MICHIGAN 48104

RECEIVED
FEB 5 1974
BUREAU OF PLANNING

IN REPLY REFER TO:
E3025
BOR 74-7

February 1, 1974

Mr. Robert L. Herbst, Commissioner
Department of Natural Resources
301 Centennial Building
St. Paul, Minnesota 55155

Dear Mr. Herbst:

This is in response to your letter dated December 28, 1973, in which you transmitted to this office a copy of the Draft Environmental Impact Statement for Inland Steel Proposed Taconite Plant Near Virginia, Minnesota. The Department of the Interior would be pleased to review the above statement.

In accordance with established Department of the Interior guidelines, seven copies of all draft and final environmental impact statements for review by the Department should be sent directly to Assistant Secretary for Program Policy, Attention: Director, Office of Environmental Project Review, Washington, D. C., 20240. His office will distribute copies to the appropriate Interior agencies.

Since you have made prior distribution of the above statement, we suggest that you advise the Department as to which field offices of our several Bureaus you have already submitted statements. You could then deduct those from the seven original copies.

Review of material for early coordination and other routine inquiries may be made directly to this office.

Sincerely yours,

JOHN D. CHERRY
Regional Director

By: Robert H. Myers
Robert H. Myers
Acting

Kena

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
1 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

February 5, 1974

Mr. Robert L. Herbst, Commissioner
State of Minnesota
Department of Natural Resources
Centennial Office Building
St. Paul, Minnesota 55155

Dear Mr. Herbst:

This letter is in response to your notice of December 28, 1973 which transmitted the State Draft Environmental Impact Statement (EIS) for Inland Steel's Proposed Taconite Plant near Virginia, Minnesota. We have reviewed the Draft EIS prepared by the U.S. Forest Service for the Land Exchange Proposed by Inland Steel. Our comments on the Forest Services EIS are attached.

Since these impact statements have been written for related government actions on the same mining operations, we believe that our comments on the Forest Service EIS are sufficiently broad to cover the primary actions of the State EIS as well.

Please note, we did not believe that the impact statement prepared by the Forest Service contained sufficient information for us to adequately assess the environmental impacts.

We thank you for providing us the opportunity to review this impact statement and we look forward to reviewing impact statements for other State projects in the future.

Sincerely yours,

Donald A. Wallgren
Chief, Federal Activities Branch

Attachment

February 13, 1974

Mr. Donald A. Wallgren
Chief, Federal Activities Branch
U. S. Environmental Protection Agency
Region V
1 North Wacker Drive
Chicago, Illinois

Dear Mr. Wallgren:

We have received your comments on the Draft EIS for Inland Steel's Proposed Taconite Plant near Virginia, Minnesota. You have assumed the state EIS is similar to the federal EIS on this project, according to the second paragraph in your February 5, 1974 letter. This is a wrong assumption!

We believe your comments on the federal EIS are not applicable to the state EIS. Most of the comments and suggestions you noted to be lacking in the Forest Service EIS were ADDRESSED AND ANSWERED in the State of Minnesota EIS.

If you wish to read and comment on the state EIS, your suggestions must be received by March 10, 1974 to comply with our time schedule. Your review will be appreciated. Thank You.

Sincerely,

Eugene R. Gere, Director
Division of Water, Soils & Minerals

EEG:dlb

MINNESOTA POLLUTION CONTROL AGENCY
1935 W. County Road B2, / Roseville, Minnesota 55113

612-636-5740

February 6, 1974

Terry Lescher
Dept. of Natural Resources
Waters, Soils & Mineral Dept.
Room 345 Centennial Office Bldg.
St. Paul, Minnesota 55155

Dear Mr. Lescher:

After listening to the testimony on the draft EIS in Virginia of January 24, 1974, I would like to recommend the following be included in the final EIS:

- a mineland reclamation plan and timetable
- a much more quantative pre-operational analysis of animal and plant populations and plant and animal tissue
- more complete hydrological and meteorological information
- schematic mineral, water, and pollutant balances for daily production
- detailed consideration of the alternative of completely closed cycle operation
- consideration of the impact on water resources of the alternative of on land disposal for the Reserve Mining taconite operation.

I would like to recommend that Inland contract a field biologist immediately to conduct pre-operational analysis. If we can be of assistance in incorporating these considerations in the final EIS, please let us know.

Sincerely,

Wes Fisher
Research Scientist

WF:ec

DEPARTMENT Natural Resources-Div. of Waters, Soils & Minerals

Office Memorandum

TO : Eugene R. Gere, Director

DATE: Feb. 12, 1974

FROM : Terry Lejcher TRL

SUBJECT: Inland Steel Environmental Impact Statement

On February 12, 1974, Weston Fisher and I had a meeting to discuss some concerns the Minnesota Pollution Control Agency had regarding the final Environmental Impact Statement for the Inland Steel Project. The topics discussed and the conclusions reached are detailed in the following:

1. Pre-operational environmental analysis:

   Mr. Fisher suggested monitoring of air, water and wildlife before the mining operation begins to establish some baseline data, similar to analysis done by NSP. After discussing differences between the the discharges associated with power plants and taconite plants, we agreed that the only significant changes possible applied to air quality. As part of the material flow schematic (#5) the final EIS would attempt to quantify air discharges of particulates, SO_2, NOx and trace metals, any or all of which are applicable.

2. Reclamation Plan:

   Mr. Fisher felt that an EIS without a reclamation plan would be subject to litigation by environmentalists. We discussed the fact that state rules and regulations concerning reclamation are forthcoming shortly and that it is unreasonable to expect any company to provide a reclamation plan when such company does not know the standards it will have to adhere to. Inland has committed themselves to meeting state requirements when they become effective. He understood the predicament, but would like to see further commitment by Inland Steel.

3. Completely Closed Water System:

   The Minnesota Pollution Control Agency would like to see a completely closed water system, mainly for protection of the creeks on site. The following reasons were sited for an open system.

   a. There is a possibility that storage capacity on the site may be exceeded by excessive rainfall. Such a situation could be environmentally unacceptable if any water control structures were subject to failure as well as unnecessary since no pollutants are expected in the discharge.

b. Low flow augmentation is an important consideration in the environmental concerns on Laurentian Wouri and Sauntry Creek as well as their receiving waters. Disrupting flow in these streams would not be a desirable alternative.

c. No discharge from the plant site settling basin will be allowed. A diversion around the basin will handle the runoff from the watershed above the settling basin.

If nutrients are added to the plant site settling basin, such water must comply with state water quality standards in order to be used for low flow maintenance.

4. Hydrology

The MPCA felt it would be appropriate to include some hydrology in the final statement. I agreed we would.

5. Material Flow Schematic

Fisher said he would work on a material flow schematic similar to the Generalized Solid Waste Disposal Model. I will quantify energy requirements, labor requirements and air and water releases.

Enclosed is a copy of the letter which generated the meeting.

TL:dp
attach.

MINNESOTA DIVISION
106 Times Bldg., 57 South 4th Street
Minneapolis, Minnesota 55401
Phone 338-1418

THE IZAAK WALTON LEAGUE OF AMERICA
INCORPORATED

February 7, 1974

Mr. Robert Herbst, Commissioner
Department of Natural Resources
Centennial Building
St. Paul, Minnesota 55101

Dear Bob:

Re: DNR Draft Environmental Impact Statement on Proposed Taconite Operation by Inland Steel Corp.

The Department of Natural Resources would appear to have done an excellent job in preparing this early draft EIS on this project. The document was well done, considering the short period of time taken to put it together, and apparently cooperation with other agencies was also found to be agreeable.

The purpose of this letter is to provide encouragement and appreciation. We often find ourselves in a position of writing and communicating only when criticizing. The job here was well done and in my opinion it's important to make that type of acknowledgement also.

I would think perhaps that another subject that the DNR, State Planning, and the Governor's Office might very well think about are the number of planted proposals that we will be seeing in the future. We have very limited water resources for increased taconite expansion in Northern Minnesota. There will no doubt be further proposals, and there no doubt should be some serious examination of whether or not the State is going to require a number of relatively small proposals such as the Inland proposal to

consolidate a new larger and more efficient less disturbing operation, or continue to allow the present pattern.

I know it becomes a very tough thing philosophically for government to say who shall or shall not, but, both from the standpoint of adverse environmental impact and from the standpoint of efficiency, maybe we should discard the trauma and look the issue squarely in the eye. At least I believe so and I know that there are other people who carry that opinion as well.

In any event, we do appreciate the effort on this project.

Sincerely,

Dave Zentner, Northern Area Vice-President
Minnesota Division IWLA

cc - Donald Backstrom
Gene Gere
Jane Laughlin

M. E. JOHNSON
GENERAL SUPERINTENDENT
MINNESOTA ORE OPERATIONS

United States Steel Corporation

P. O. BOX 417
MT. IRON, MINNESOTA 55768

February 11, 1974

Department of Natural Resources
Centennial Office Building
St. Paul, Minnesota 55101

Attention: Mr. Eugene R. Gere, Director
Waters, Soils and Minerals Division

Gentlemen:

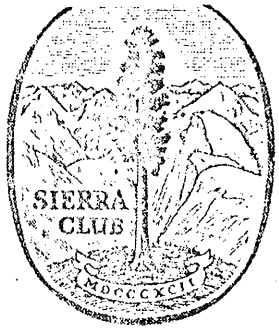
With reference to the application of Inland Steel Company to appropriate water from the St. Louis River watershed in connection with its proposed Minorca taconite project, which application was submitted to your department on May 31, 1973, we wish to advise that United States Steel Corporation has an understanding with the applicant that the granting of a permit pursuant to said application shall, as between the companies, be without prejudice to the water rights of United States Steel Corporation.

United States Steel Corporation has no objection to the State granting Inland Steel Company a water appropriation permit pursuant to said application.

Very truly yours,

M. E. Johnson

Copies to:
Carl B. Jacobs, Inland Steel Company
John M. Donovan
B. J. Blacik

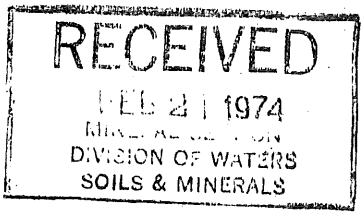


PROJECT
ENVIRONMENT

A fulltime lobbyist
for the
Minnesota Environment

Roanoke Building, Minneapolis MN 55402 (612) 333-4591

February 18, 1974



Mr. Robert L. Herbst
Department of Natural Resources
Centennial Office Building
St. Paul, Minnesota 55101

RE: Environmental Impact Statement, Inland Steel Taconite Plant, Virginia, Minnesota

Dear Mr. Herbst:

I have had an opportunity to review the draft environmental impact statement on the proposed Inland Steel Taconite Plant near Virginia, Minnesota. I have also had occasion to review several summaries of the testimony presented at the hearing on January 24. Since this is the first environmental impact statement prepared under the new Minnesota Environmental Policy Act, it is extremely important that a good precedent be set and that an adequate job of evaluation of the environmental problems be prepared.

The purpose of an environmental impact statement is obvious, to allow the full exploration of the adverse environmental problems and their possible solutions in order to allow decision makers to make the correct policy choice and to ameliorate adverse environmental effects. The courts in their decisions under the National Environmental Policy Act have repeatedly held that the test in terms of the adequacy of the statement itself is whether it is a full disclosure of all adverse environmental effects. This implies that where there are adverse effects they be fully examined and if appropriate adequate scientific investigation of the adverse effects be undertaken prior to the making of the policy decision. For example, in the Tennessee-Tombigbee Navigation Project case, Environmental Defense Fund v. Corps of Engineers, 348 F.Supp. 925, 927 (1972), the court stated:

> " [We] declar[e] that the phrase 'to the fullest extent possible' clearly imposes a standard of environmental management requiring nothing less than a comprehensive and objective treatment by the responsible agency....

> "Thus, an agency's consideration of environmental matters that is merely partial or performed in a superficial manner does not satisfy the requisite standard."

This language, "to the fullest extent possible," is the same as that used in the Minnesota Environmental Policy Act. In another case, Environmental Defense Fund v. Hardand, 325 F.Supp. 1401, 1403 (1971), the court interpreted the section of the National Environmental Policy Act calling for systematic, interdisciplinary evaluations as requiring research where information about adverse outcomes is not known:

> "[Section 102 (2) (A)]... makes the completion of an adequate research program a prerequisite to agency action. The adequacy of the research should be judged in light of the scope of the proposed program and the extent to which existing knowledge raises the possibility of potential adverse environmental effects."

In the case of the EIS on the Inland Steel Taconite Plant, there are a number of situations where conclusory statements without any justification or vague generalities are accepted without further inquiry. Also, in a number of cases there does not exist knowledge sufficient on which to base a reasonable opinion or with which to gauge the future environmental effects (the most striking of these is the lack of any pre-operational monitoring program to provide base line levels for pollution in that environment). Also, the EIS lacks any cost benefit analysis or any attempt to quantify the previously unquantified environmental factors.

We are also extremely concerned that the treatment of reclamation in the EIS does not evaluate the alternative methods which could be used or provide any guidance as to their outcome but instead merely references the fact that by mid 1974 the state will adopt reclamation standards. This is an important environmental problem associated with mining and should receive much more detailed commentary as to the adequacy of present reclamation techniques and their applicability to this particular mine site.

Attached to this letter are a number of comments on the impact statement prepared by Ben Marks, a member of the Sierra Club North Star Chapter. His comments, in more detail, reflect the concerns which I have indicated in this letter.

It is our hope that the revised final impact statement on which decisions will be made will consider all of these factors and that the decision itself will be responsive to the additional

new information.

Sincerely,

John Herman
Counsel for the Sierra Club

JH:na

Enclosures

cc: Mr. Eugene Gere
Mr. Ben Marks
Mr. Gerald Christenson
Mr. Wes Fisher
Mr. Terry Lescher

COMMENTS ON PROPOSED INLAND STEEL TACONITE PLANT FOR VIRGINIA, MINNESOTA

prepared by Ben Marks on behalf of the North Star Chapter of the Sierra Club

I. DESCRIPTION OF THE ENVIRONMENTAL SETTING

1. Socio-Economic Impact of Proposed Plan on Surrounding Area: A comprehensive development plan for the region should be begun immediately so that the effect of the plant can be channeled into the areas best suited to benefit from it.

3. Area Geology: This information is a bit brief. The description of the formation includes no information on the effect mining and/or processing has on the rock. Are any of the minerals soluble enough to cause problems in water supply? Do any tend to break down into particles small enough to become fugitive dust, etc.

4. Soils: Soils information is too general. The soils areas should be better researched and related to their suitability for the type of development proposed on them. What is their potential for reclaiming the land. Are they fertile enough to support vegetation if saved separately and spread for reclamation.

5. Climate: Better and more detailed information is needed. Are severe storms coming in spring which might break the dam for the holding ponds or cause major erosion in the tailings basin. How large is the spring melt-off. Will the basins have adequate capacity to contain it in addition to the normal water level?

6. Wildlife: Again, too vague. "Moderately abundant", "sparse" should be replaced by population by acre or square mile so that reclamation and recovery success can be judged after completion of mining. Streams should be sampled for fish population, temperatures, turbidity, and mineral content prior to and during mining so that problems can be detected before they reach lethal levels.

II. ENVIRONMENTAL IMPACT OF THE PROPOSED OPERATIONS

Reclamation stipulations should be written and agreed to before the commencement of development. They should for the reasons mentioned include provision for progressive reclamation as areas become inactive.

2. Physical Characteristics: Reclamation standards should require reclamation to minimize changes in physical characteristics.

3. Wildlife Impact: Effects on wildlife should be minimized as much as possible by reclaiming land as it becomes inactive with vegetation conducive to re-establishment of the natural community.

4. Water

   a. Domestic Use: All precautions should be taken to insure that Inland's proposed wells will in no way endanger or degrade the local water supply, nor should any degradation of the aquifer through the mining be allowed to take place.

   b. Industrial Use: (1) The fact that the additiona water used by Inland from the East Two River Wate shed is only a fraction of a percent of the total should not deter an investigation of its impact. There must be consideration given to the cumulati effects from the increased sum of the withdrawals

   (2) The tailings ponds are not set up as closed systems. There is the question of seepage and of direct augmentation of Wouri Creek. The expected amount of seepage should be identified so that it can be determined whether supplementation of flow in Wouri Creek will be necessary.

   (3) Historic justification is not adequate reaso for disregard of danger. Careful and documented consideration should be given to the effects of the pits on the hydrology of the area.

   c. Aquatic Habitat: No degradation of water quality or acquatic habitat should be permitted.

6. Air

   a. Tailings Basin: The tailings basin should be kept in the most stable condition possible through at least the implementation of the methods mention Fugitive dust regulations must be observed.

   b. Waste Disposal Area: The waste disposal area must be likewise stabilized. Top soil should be separated and used to increase the fertility of the piles and encourage revegetation.

   c. There is no discussion of plant air emissions, the ability to satisfy PCA standards and the extent of degradation that will occur.

7. Outdoor Recreation: The Laurentian Divide Trail should be relocated in an aesthetically acceptable route and so that there will be no interruption in availability.

GENERAL COMMENTS AND RECOMMENDATIONS:

1. The reclamation standards should be agreed to before mining commences and should be a part of the environmental impact statement.

2. Much more specific data and documentation of the existing ecosystem should be provided. A pre-operational water and air monitoring system should be immediately established. This should then be quantitatively compared to the expected effects of the plant and monitored during operations to provide longitudinal comparisons.

3. The water economy of the plant should be a completely closed system.

4. Separation of top soil for reclamation should be required, especially for the waste rock pile and tailings basin. Effluent and sludge from the sewage treatment plant should also be used if possible to help restore fertility to those areas.

5. All basin capacities and environmental absorbtive capacities must be based on the highest proposed mining rates, not on the expected rates.

6. It would be much easier to make specific comments if pages were numbered.

INLAND STEEL COMPANY

IRON MINING DEPARTMENT

ISHPEMING, MICHIGAN 49849

GENERAL OFFICE
PHONE: 906/486-9961

February 25, 1974

Mr. Terry Lejcher
Hydrologist
State of Minnesota
Department of Natural Resources
Division of Waters, Soils and Minerals
Centennial Building
St. Paul, Minnesota 55101

Dear Terry:

In connection with your request that we give you a breakdown on the distribution of the taconite tax, following is the latest information which we have on this split:

11½%	City, Village or Town
27%	School District
11½%	County
3%	State
47%	Taconite Property Tax Relief Account

If there is any further information that you need, kindly advise.

Yours very truly,

D. E. Brown

D. E. Brown
Chief Engineer

DEB:SP

STATE OF MINNESOTA

DEPARTMENT Natural Resources - Parks & Recreation **Office Memorandum**

TO : Vonny Hagen
Bureau of Planning

DATE: March 1, 1974

FROM : Milt Krona
Parks Planner

SUBJECT: Inland Steel Comments on Their Plan

This may be old but I am just cleaning up some old correspondence and I don't know where we're at. The Division of Parks and Recreation has three concerns:

1. To maintain the Lorenzen Creek into some reasonable flow in all seasons.

2. The over burden contours need more details at the present time. they don't make much sense. The steps are not very clearly spelled out.

3. The run off from the plant site should be funneled into some kind of storm water basin where there is at least an opportunity for settlement, if not treatment.

4. What is the problem of additional people coming into the area to operate the plant? Particularly, on active recreation, school system, highways, street system, sewer system, etc. This should be part of the environmental impact statement.

MK:pr
cc: Waters, Soils and Minerals
Ray Blomgren & TERRY

X. AGENCIES AND INDIVIDUALS CONSULTED

1. U. S. Forest Service
   Superior National Forest
   Headquarters
   Box 338
   Duluth, Minnesota 55801

2. Department of Economic Development
   51 East 8th Street
   St. Paul, Minnesota 55101

3. Department of Health
   717 Delaware Street SW
   Minneapolis, Minnesota 55440

4. Pollution Control Agency
   1935 West County Road B2
   Roseville, Minnesota 55112

5. Department of Agriculture
   Room 530
   State Office Building
   St. Paul, Minnesota 55155

6. State Planning Agency
   Capitol Square Building
   550 Cedar Street
   St. Paul, Minnesota 55101

7. Arrowhead Regional Development Commission
   900 Alsworth Building
   Duluth, Minnesota 55802

8. St. Louis County Planning and Zoning Dept.
   Court House
   Duluth, Minnesota 55802

9. Exelson - Sommerfield & Assoc.
   Consulting Engineers
   600 Torrey Building
   Duluth, Minnesota 55802

10. Inland Steel
    Iron Mining Department
    Ishpeming, Michigan 49849

MAILING LIST FOR ENVIRONMENTAL IMPACT STATEMENT ON INLAND STEEL PROPOSED TACONITE PLANT NEAR VIRGINIA, MINNESOTA

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Minneapolis, Minn. 55401

Senator Hubert H. Humphrey
462 Federal Courts Bldg.
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Representative John Blatnik
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Hibbing, Mn. 55746

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Rudy Perpich
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Roseville, Mn. 55113

Edward Wiik, Director
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Ralph J. Godin
Deputy Commissioner
Dept. of Agriculture
Room 530, State Office Bldg.
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Virginia, Mn. 55792

Town of Wouri
Star Route
Virginia, Mn. 55792

Fred Cina
Iron Range League of Municipalities
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Wilfred Doig
Land Administrator
St. Louis County
Duluth, Mn. 55802

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Genoa Location
Eveleth, Mn. 55792

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St. Paul, Mn. 55103

Ecological Society of America
Minnesota Chapter
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Izaak Walton League, Minn. Div.
63 South Fourth St.
Mpls, Mn. 55401

League of Women Voters of Mn.
555 Wabasha St.
St. Paul, Mn. 55102

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St. Paul, Mn. 55101

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Mpls, Mn. 55422

Minn. Chapter, The Nature Conservancy
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Minn. Committee for Environmental Information
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Mpls, Mn. 55414

Minn. Conservation Federation
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Hopkins, Mn. 55343

Minn. Environmental Control Citizens Assoc.
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Karim Ahmed
MPIRG
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Quentico Superior Foundation
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Sierra Club (North Star Chapter)
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St. Paul, Minn. 55108

Save Lake Superior Assoc.
1709 South Street
Duluth, Mn. 55812

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Bureau of Mines
Fort Snelling
Twin Cities, Mn. 55111

Bureau of Outdoor Recreation
Lake Central Regional Office
3853 Research Park Dr.
Ann Arbor, Michigan 48104

XI. LITERATURE CITED

1. Arrowhead Regional Development Commission. Personal Communication.

2. Inland Steel Company. "Application for Permit for the Consumptive Use of Water". Proposed Taconite Operation in St. Louis County, Minnesota. 1973.

3. Minnesota pollution Control Agency. "Water Quality Management Plan". July, 1971.

4. Superior National Forest. Land for Land Exchange Proposed by Inland Steel Company. Draft EIS. 1973. 43 pp.