PHASE I - ENVIRONMENTAL SITE ASSESSMENT

CLIFFS ERIE PROPERTIES INCLUDING; THE HOYT LAKES FACILITY, DUNKA PROPERTY, TACONITE HARBOR AND RAILROAD CORRIDORS

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DISCLAIMER

All information presented in this Phase I Environmental Site Assessment is based on reviews of available literature, records, and informal discussions with various governmental agencies, contractors, and other personnel involved with the property. Conclusions presented are a result of interpretations of the information collected by Northeast Technical Services, (NTS).

Since several conclusions reached in this evaluation were based on information from others or readily available documentation, newly documented or changed verbal information discovered after submittal of this report could result in reinterpretation and alteration of conclusions presented. No soil or water samples were collected or submitted for laboratory analysis as part of the Phase I ESA to verify or confirm the implied quality.

This report does not constitute an assurance or guarantee by NTS that the subject property is presently, nor will it necessarily remain free, from environmental impairment. However, NTS has made every effort to conduct a thorough and complete evaluation of the subject property before submitting this report.

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INTRODUCTION

The former LTV Steel Mining Company (LTVSMC) ceased mining operations in 2001 and subsequently Cliffs Erie, L.L.C. (CE) acquired portions of the facility directly related to mining and ore processing. Minnesota Power (MP) acquired portions not directly associated with the mine and processing. Minnesota Rules 6130 require a Mine Closure Plan for the facility. The CE Draft Closure Plan (March 14, 2001) provides a framework for work to be conducted as part of the closure process. In general, closure work falls into two categories:

1. Work that falls under regulatory oversight by the Minnesota Department of Natural Resources (MDNR).
    - Plans for pit to watercourse discharges.
    - Mineland reclamation
    - Plans for tailings basin drainage.
2. Work that falls under regulatory oversight by the Minnesota Pollution Control Agency (MPCA).
    - Investigation and potential cleanup of contaminants in soil or groundwater related to the mining operations.
    - NPDES permit modifications to allow discharge of basin seepage.

CE retains the responsibility for closure of the mine (areas not currently owned by MP) and entered the Voluntary Investigation and Cleanup (VIC) Program of the MPCA on April 4, 2002 as a route to addressing issues that fall under regulatory oversight by the MPCA. Conducting closure work as a volunteer in the VIC Program will result in legal or administrative assurances, issued by the Commissioner of the MPCA, that apply either to CE as an entity, or to specific legally described lands. These assurances are intended to streamline re-use or redevelopment of the idled facility. In essence, the facility is viewed as brownfield that must undergo routine phase I assessment, phase II investigation, and risk based decision making that incorporates planned land use regarding identified releases that arise from the phase I and phase II process.

Northeast Technical Services, Inc. (NTS) was retained by CE to conduct a Phase I Environmental Site Assessment (ESA) of the CE owned facility which consists of the following general land descriptions:

1. Mining areas at Hoyt Lakes and Dunka.
2. Plant area at Hoyt Lakes.
3. Railroad Corridors including Murphy City.
4. Taconite Harbor including the loading docks, marine fueling, and coal ash landfill.

METHODOLOGY AND LIMITATIONS

The purpose of this Phase I ESA is to provide the appropriate level of inquiry to delineate Areas of Concern (AOC) which will require phase II investigation. An AOC is defined as a discrete area of the property where a known release, or a material threat of a release is identified by the level of inquiry provided by this document. Sampling and Analysis Plans (SAP) will be developed for each of the areas of concern and will contain sufficient details regarding the practices and contaminants of concern to identify individual Recognized Environmental Conditions (RECs).

The scope of this Phase I ESA generally follows the 2000 version of ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation: E 1527-97) and is consistent with the MPCA VIC Guidance Document #8.

Due to the large land area and the unique use of the property, several limitations are noted:

1. Record searches did not designate a specific address. Rather, Environmental Data Resources (EDR) provided an "Area Search" for the Hoyt Lakes Facility and Taconite Harbor. Environmental record searches were not obtained for Murphy City, Dunka or the railroad corridor.
2. The historical land use was developed primarily from information obtained from interviews. Drawings, plans, and air photographs archived by CE Mine Engineering and Plant Engineering, were used to verify historical information.
3. Questions presented in the ASTM Owner Questionnaire are very difficult for one individual to answer given size of the facility and the recent change in ownership. Therefore, an owner questionnaire was not completed for the facility.
4. Records used to inventory storage tanks contain some inconsistencies that have not been explained. These are discussed under the AST and UST inventory section.
5. The entire facility was accessible for performance of the ESA. However, the very large land area made inspection of all land area practicably unascertainable.

Historical land use, development of the property and description of the mining process is presented for the property as a whole. Site descriptions (physiographic, geologic and hydrogeologic), standard environmental records searches, and interviews and site reconnaissance are presented separately for the following;

1. Hoyt Lakes (mining areas and plant) and Dunka,
2. Taconite Harbor
3. Railroad Corridor

GENERAL HISTORICAL BACKGROUND

The CE "Facility" consists of major portions of former LTVSMC. The historical development of the whole facility is important in understanding the overall property use.

The Erie Mining Company (EMC) was formed in 1940 to pursue a process for economic recovery of iron from taconite. The research culminated in the construction and operation of the Erie Experimental Taconite Plant (Pre-Tac) which operated between 1948 and 1957. Pre-Tac was located in the SW ¼, of the SE ¼ of Section 28, Township 59North, Range 15 West, or near the western extent of the current Hoyt Lakes mine area.

The decision to proceed with construction of a full scale commercial taconite plant was largely based on the estimated reserves on lands controlled by EMC. The reserves would need to yield a minimum of 10.5 million long tons annually of agglomerated concentrate with an average dry iron content of 64% over a period of 40 years; or a total of 420 million long tons of concentrate. In 1951 EMC held lands were divided into the following areas:

1. Area 1 with a minimum yield of 83 million long tons of concentrate.
2. Area 2 with a minimum yield of 142 million long tons of concentrate.
3. Area 3 with a minimum yield of 83, million long tons of concentrate.
4. Area 3X with a minimum yield of 90 million long tons of concentrate.
5. Area 4 with a minimum yield of 92 million long tons of concentrate.

These yields exceeded the 420 million long ton requirement and EMC initiated construction of a full scale facility in 1954.

The EMC full scale facility was originally constructed and owned by Bethlehem Steel Corporation (45%), Youngstown Sheet and Tube Company (35%), Interlake Iron Corporation (10%) and Steel Company of Canada Limited (10%). The facility consisted of a 7.5 million ton annual capacity taconite processing plant at Hoyt Lakes, a coal fired steam electric generating plant in Taconite Harbor, and approximately 75 miles of railroad and power lines connecting the Hoyt Lakes plant to the generating plant. The facility was placed into production in September, 1957 with the first load of pellets shipped in December of 1957. Pickands Mather Company (PM) was the original managing agent for the mine.

The Taconite Tax Amendment, passed in November, 1964, provided fair tax structure for taconite producers. Consequently, in 1965, PM announced an expansion program for EMC which would bring it's pellet producing capacity to 10.6 million tons annually. Construction began in the same year and by 1967 EMC was meeting the new production rate. Additional mining areas were permitted over the years as steel requirements dictated.

Ling-Temco-Vought Corporation (LTV Corporation) of Dallas Texas acquired 100% ownership of EMC in May, 1986 and renamed the facility LTV Steel Mining Company (LTVSMC) in 1987.LTV Corporation filed for reorganization under Chapter 11 bankruptcy on July 17, 1986. LTV Corporation came out of bankruptcy in 1993 as LTV Steel Corporation of Cleveland, Ohio.

Also in 1986, Cleveland Cliffs Iron Company (CCI) purchased PM and became managing agent for the facility.

On May 24, 2000, LTV Steel Corporation announced it would close LTVSMC in the summer of 2001. On December 6, 2000, the closure date was moved up to February 24, 2001. On December 29, 2000, LTV Steel Corporation filed for reorganization protection under Chapter 11 bankruptcy for the second time. On January 3, 2001, it was announced that LTVSMCs Hoyt Lakes mines and processing plant would close immediately resulting in the last balling drum circuit being emptied on January 5, 2001. All employees , except those needed to winterize the plant, were classified as being on-call. The last product left the plant site, by railcar, on July 19, 2001and the last ore boat departed Taconite Harbor Docks on July 22, 2001.

On October 30, 2001, CE (a company of Cleveland Cliffs Incorporated) and MP purchased the facility and assets. MP now owns the power plant, former Taconite Harbor Village and some related lands. CE owns the mine sites, taconite processing plant, loading docks, marine fueling, and railroad corridor.

GENERAL OVERVIEW OF THE TACONITE PROCESS

Unlike sulfide ore mining, the process of mining and processing taconite does not generate hazardous waste or hazardous substances as a result of the process. The process waste is overburden, waste rock, and tailings. These materials alone are not considered to lead to a release of contaminants of concern. One exception to this “benign waste rock and tailings rule” exists at Dunka where some sulfide minerals exist within some of the waste rock. This condition is discussed in a later section. In general, waste containing contaminants of concern are generated as a result of using materials related to the process such as fuels, lubricants, hydraulic fluids etc. Therefore, this Phase I ESA was conducted by identifying areas where materials other than process waste where used or disposed. Locating these areas was largely dependent upon use of existing drawings and interviews with current and former employees.

The general taconite process is divided into the following categories; mining, crushing, concentrating, agglomerating, railroad, docks, and power plant.

MINING

Mining operations were conducted at the Hoyt Lakes location and the Dunka location. Mining includes drilling, blasting and loading ore to an in-mine railroad. The mining lands are divided into the following areas which are shown on Figure 2 in Appendix A:

1. Area 1
2. Areas 2, 2 East, and Area 3
3. Area 2 West

4. Area 2 West X
5. Area 5
6. Area 6
7. Area 8 (Dunka)
8. Area 9 Northwest
9. Area 9 South

One additional mine area, generally referred to as the McKinley Extension, exists near Area 6 and Area 9. The McKinley Extension is owned and was mined by US Steel Corporation except for a period of time during which the Northwest Ore Division leased the area. The McKinley Extension has been formally "closed" in accordance with Minnesota Rules 6130 and is not included in this phase I.

In general, each mine area contains the following infrastructure:

- Fueling – Fueling in the mine areas consisted of above ground storage tanks (AST) containing fuel oil or gasoline for in-mine heavy equipment (haul trucks, loaders and rubber tired dozers). Early in development of the mining areas fueling was accomplished with mobile above ground storage tanks (AST) which were either skid mounted, or consisted of a semi trailer transport tank. More permanent fueling stations were installed during the 1980s and 1990s that consisted of ASTs meeting standard construction specifications. The dispensers are located within large shelters with concrete floors (Photograph 1, Appendix G). Any spills that occurred within the shelters during fueling were contained and drained to holding tanks in series that are pumped periodically. In-pit locomotive fueling was accomplished with a locomotive fueling stations located near the Area 1 and Area 2 shops facilities. Fueling for the mainline railroad locomotives was done at the Knox Locomotive Fueling Station which is discussed later. Tables 2 though 5 summarize the AST and underground storage tanks (UST) inventory at the entire facility.
- Loading pockets – Initially, shovels loaded rail cars directly. However, this required continual construction of temporary rail spurs to the blasting site. To accomplish quick rail construction, rail panels (short sections of rails with ties attached) were constructed. To eliminate complications of loading railcars directly, a shovel loaded ore into haul trucks for transport to a loading pocket. The loading pocket provided a means of loading ore into rail cars for transport to the processing plant without the need for temporary rail spurs. The pockets were generally in close proximity to the truck fueling stations. Two types of loading pockets were the vibratory type (Photograph 2, Appendix G) and the Superpocket type (Photograph 3, Appendix G). The vibratory pockets were electrically powered and the only waste stream was small amounts of lubricant for wear surfaces. The superpocket type was electric/hydraulic powered and therefore used hydraulic fluids.

- Reporting – A set of buildings where mine employees reported for work and general operations within the area were controlled (Photograph 4, Appendix G). The buildings contained locker rooms, showers, office, lunch room, etc. Septic systems and drinking water systems (wells or holding tanks) were associated with each reporting area. The septic systems were connected to domestic type sewage only and are not considered a concern. Table 6 presents an inventory of wells and septic systems.

Other mine infrastructure that is not specific to all mine areas are the following:

- Area 1 Shops, Area 2 Shops and Dunka Shops –The shops were constructed during the original plant construction and upgraded in 1967 during the overall plant expansion. The reason for upgrading was primarily to accommodate the increasing size of equipment used. The Area 1 and Area 2 shops provided general maintenance of in-mine equipment while Dunka shops provided only light maintenance such as brakes lubrication etc.

CRUSHING

Ore delivered to the plant site is offloaded to the coarse crusher which uses 60 inch and 36 inch gyratory crushers to reduce the crude ore size to six inches. The coarse crushed ore is delivered to the fine crusher which uses a series of standard and shorthead crushers to reduce the crude ore to 1inch. Various heavy lubricants are used on the bearing surfaces of the crushers.

CONCENTRATING

Concentrating is essentially a separation of the iron containing minerals from the rest of the crude ore and includes the following components:

- Rod mill – A rotating drum filled with metal rods. The rotation pulverizes the crushed ore to finer material
- Magnetic separators – Magnetite grains are separated from the pulverized ore by rotating magnetic drums.
- Ball mill – Same as a rod mill except that metal balls rotating in a cylinder pulverize the ore.
- Cyclone – Tapered cylinder that spins and separates grains of pulverized ore by specific gravity.
- Hydraulic concentrator – Separates magnetite from the bulk based on specific gravity.
- Floatation – final finishing separation step. Pulverized ore is added to an aqueous solution of amines for final separation.

The process of concentrating uses large amounts of water with tailings discharged to the tailings basin as a slurry. As solids settle out of the slurry water is recycled back to the plant as a closed

system. Any seepage out of the tailings basin is identified as a discharge point and monitored under a NPDES Permit.

AGGLOMERATING

Agglomerating produces finished taconite pellets and includes the following:

- Thickener - The concentrate is delivered as a slurry to the thickner were settling increases the concentrate to water ratio.
- Filter – The thickened slurry is filtered to arrive at a filter cake with acceptable moisture content for the balling step.
- Balling – Bentonite and concentrate is added to a rotating drum. The right mixture of moisture, bentonite and concentrate forms "green pellets".
- Furnace - The furnaces fired the green pellets to form finished "hard" pellets. The original plant furnace was fired with #6 fuel oil stored in three large ASTs. The fuel was offloaded by railcar. The furnaces were converted to natural gas between 1965 and 1968. #6 fuel oil was used as backup to the natural gas which was not available to the mine during regional supply shortages.

RAILROAD

Railroad – Provides transport of finished pellets to Lake Superior shipping providers. The railroad consisted of the following:

- Rail corridor – Originally constructed concurrent with the original plant, the corridor is constructed with ballast (crushed rock), rail ties and rail lines. Switches are manual with the exception of several electric switches near the taconite harbor end of the rail line. Power for crossing signs and switches is provided by several battery houses (Photograph 5, Appendix D) with solar panels to recharge the batteries. Prior to solar panels the batteries were changed out periodically by railroad maintenance crews.
- Knox locomotive fueling - Located on the south edge of the plant and processing area. Locomotives are diverted off the mainline through the facility (Photograph 6, Appendix G).
- Murphy City (Photograph 7, Appendix G) was originally a location from which the rail line construction was coordinated. Susequent use of the facility was for maintenance of way and consists of several buildings including a minor repair building, storage building, and reporting building. Locomotives were not fueled at Murphy City but several AST exist for light vehicle fueling.

DOCK

Dock and marine fueling – Provides unloading of the railcars and loading to ore boats. The fueling facility consists of two large ASTs which were originally filled from rail cars. The filling since approximately 1968 has been from truck transport. Above ground piping delivered fuel to the loading dock for marine traffic.

POWER PLANT
Power plant and power line – provides electric power to operate the Hoyt Lakes plant. The power plant is not a portion of CE owned lands and is not included in this Phase I.

OTHER INFRASTRUCTURE
Infrastructure of the whole facility not described above includes the following:

1. Pellet storage area.
2. Administration building.
3. General shops – contained a weld shop, blacksmith shop, car shop, locomotive shop, machine shop, rebuild shop, and carpenters shop.
4. Domestic waste water treatment plant (WWTP) - treated only sanitary sewage
5. Water treatment plant – provided potable water for the Hoyt Lakes facility.
6. Emergency basin – received storm water and process waste water.
7. Red water basin – received storm water from the shipping area.
8. Colby Lake pumping station – provides water to the reservoir through a 36 inch line for plant process water and the water treatment plant.
9. Dunka wetland system and water treatment plant – provides metal reduction in waste rock stockpile seeps.
10. Heating plant – provides hot water heat for the plant area buildings. Originally coal fired, the heating plant was converted to natural gas following the 1993-1994 heating season.

The primary buildings of the plant site are constructed into bedrock. Therefore, the lowermost portion of the building is well below grade. Floor drains and sump pumps exit the bottom of the buildings and discharge to the Emergency Basin.

UST AND AST INVENTORY

USTs were removed during the late 1980s and early 1990s and as a result there are currently no known USTs at the entire facility except for tank 001. Tank 001 is located at the administration building and was abandoned in place in the late 1970s to avoid building damage.

LTVSMC records provide documentation of existing ASTs and removed USTs. However, historical ASTs are more difficult to accurately inventory. As previously mentioned, some ASTs at the facility where mobile and probably never were inventoried. An attempt was made to inventory both existing and historical tanks using the following resources:

1. The current AST Permit for the Hoyt Lakes Facility (AST Permit #5297).

2. The current AST Permit for the Koch Marine Fueling facility (AST Permit # 51740).
3. The MPCA list of registered tanks (TABS site database) for Hoyt Lakes, Dunka, Murphy City, Koch Marine Fueling, and Taconite Harbor.
4. LTVSMC internal records.
5. Interviews with former LTVSMC Staff.
6. Site reconnaissance.

The results of the inventory are presented in Tables 2 through 5. The TABS database, and AST Permits are contained in Appendix E. It should be noted that the TABS site ID for Taconite Harbor applies to the power plant which is owned by MPL and is not a part of this phase I. However the Taconite Harbor database is presented in Appendix E to demonstrate apparent inaccuracies between the power plant tanks and tanks that existed at the docks and the marine fueling facility. Some AST are listed under both databases and as result are listed in the AST permits. In addition, both databases contain several AST of approximately 180,000 gallon capacity. Review of air photos and interviews with former staff do not support the existence of these tanks. The only known tanks at the marine fueling facility include the existing AST listed in Table 2 and one removed AST listed in Table 3. The removed AST stored #2 fuel oil used for heating the lines for the heavier #4 and #6 fuel oil.

The TABS databases listing for the Hoyt Lakes facility includes multiple listings for AST that cannot be accounted for through historical records reviewed to date. In addition, these AST are not included in the AST permit for Hoyt Lakes and are not included in Tables 2 through 5. Additional, searches and interviews will be conducted to determine why these listings exist.

PROJECT BOUNDARIES AND OWNERSHIP

Lands that comprise the operating mine are those formerly owned or leased by LTVSMC. The purchase of the facility by CE and MP resulted in two parties owning lands within the mine area in addition to the leased lands. This phase I applies to all lands that belonged to the operating mine that are not currently under ownership by MP.

Figure 1 presents a GIS map prepared by the MDNR, Minerals Division, that shows lands owned by CE, owned by MP and owned by both CE and MP. It should be noted that the smallest land unit recognized by the map is a 40 acre parcel, although actual ownership may be less than the entire 40 acres.

MINE AND PLANT AREAS

REGIONAL GEOLOGY AND HYDROGEOLOGY

Bedrock geology underlying the entire mine and plant area consists of a sequence of, from oldest to youngest, (1) undifferentiated Archean volcanic and volcanogenic rocks, (2) the Pokegama Quartizite, (3) the Biwabik Iron Formation and (4) Virginia Formation. The sequence of the Pokegama, Biwabik and Virginia formations are gently folded and dip to the southwest at approximately 10 degrees. However, dips within localized areas of the mine may be very erratic with some dipping to the north. The Geologic Map of the Mesabi Iron Range (Meineke et.al.) is attached in Appendix F and contains descriptions of each geologic unit and shows the location of the mining areas and the plant site with respect to the various bedrock units. Notice that Area 6 (Dunka) lies at eastern extent of the Biwabik Iron Formation. Additional description of the bedrock geology can be found in Morey, D.G. (1993).

During the Pleistocene glacial event, the Biwabik Formation and associated bedrock provided an area more resistant to glacial erosion than bedrock to the north and south. The result is an east-west trending ridge that forms a watershed divide. Glacial deposits are distinctly different north of the divide from the deposits on the south side of the divide. North of the divide glacial sediments are associated with the Rainy Lobe and consist of thin patchy deposits of sandy, stony till overlying the scoured bedrock. Glacial deposits south of the divide are thicker, the uppermost associated with the DesMoine Lobe. These sediments are generally gray or red-brown silty to clayey tills. Most of the glacial sediments (overburden) have been stripped from the mine areas of the CE facility. In addition, other areas where overburden has not been stripped, contain overburden and waste rock stockpiles or tailings over the original ground surface.

The Hoyt Lakes Mine and plant area lies at the northern edge of the St. Louis River Watershed. Surface water from the Tailings Basin area flows north to the Embarrass River which drains south to a confluence with the St. Louis River. Surface water drainage from the most of the plant area and the mine area at Hoyt Lakes flows either south to Colby Lake, or east to the Partridge River which ultimately drains to the St. Louis River, via Colby Lake.

Local groundwater flow systems occur within the glacial overburden where it remains in sufficient thickness, and within overburden and waste rock stockpiles. These small local flow systems tend to be hydraulically isolated from other local flow, with discharge to small intermittent streams, wetlands or leakage to intermediate and regional flow systems within the Biwabik Iron Formation and Virginia Formation. The Virginia Formation and the Biwabik Iron Formation contain fracture systems sufficient to be considered as aquifers.

Mine dewatering over the years has produced enough drawdown around active mine pits that the water table lies within the fractured bedrock. Therefore, local groundwater elevations and flow directions are very complex across the entire facility.

The Dunka mine area lies within the Rainy Lake Watershed. Surface water drainage is easterly to the Dunka River which discharges to Birch Lake. Very little glacial overburden existed over the bedrock surface and mine dewatering has depressed the water table within the fractured bedrock. Local groundwater flow occurs within the overburden and waste rock stockpiles. Discharge from the these stockpiles occurrs as seeps to small streams and wetlands. Due to the geology of much of the waste rock from the Dunka mine, these seeps contain elevated

concentrations of metals. Wetland treatment systems and an active water treatment plant have been constructed to reduce the metal concentrations to acceptable levels prior to discharge to the Dunka River.

ENVIRONMENTAL RECORDS REVIEW

An Area Study Report was received from Environmental Data Resources, Inc. (EDR) and is attached in Appendix C. The Area Study Report differs from a Radius Report in that lands surrounding the subject property are not included. The ASTM criteria for minimum search radius surrounding the CCI lands is not met. File evaluations included review of both federal and state records. The list of databases is included in the EDR report.

There were no reported sites, under any of the databases, that had sufficient location information for mapping. The Orphan Summary in the EDR Report lists all sites that may be within the area search boundaries based upon common location descriptions, but cannot be absolutely located. Review of the orphan listings yields the following sites that may be within the project boundary:

1. Former Monsanto Plant was obtained from the UST database with location information only as HWY 110. The listing contains two gasoline UST and one fuel oil UST, all of which have been removed. The Tank owner was Viking Explosive. This site was not within the project boundary of this phase I and is not considered an AOC.
2. Erie Mining Dump #2 was obtained from the MN LS database. Information within the listing states that the site is located approximately 2.5 miles north of CSAH 110. The MPCA ID is MNODIOOO1125. This is the same as site as the LTV Private Landfill discussed elsewhere in this document.
3. Monsanto Co. was obtained from the RCRIS SQG-FINDS database. No violations were listed in the information and this site is not within the boundary of this phase I.
4. Hoyt Lakes Demolition Landfill was obtained from the MN LS database. The location is listed as 2 miles north of 110. this is likely the same site as the closed Hoyt Lakes Landfill which is not a portion of this Phase I project area.
5. LTV Steel Mining Company was listed under FINDS, MN Spills, RCRIS-LQG, and MLTS databases. Most listings were related to specific waste generator manifest, record keeping violations, not necessarily related to a release. Eleven spill reports were included.
6. The USX Corp. McKinley Mine was obtained from the RCRIS-SQG database. No violations were reported in the listing and this property is not part of the CCI property.

INTERVIEWS, ON SITE RECONNAISANCE AND ARIAL PHOTO REVIEW

One primary site reconnaissance of the Hoyt Lakes Facility was conducted on June 19, 2002. Several follow up visits occurred on July 24, 2002 and July 29, 2002. Jim Stanhope accompanied NTS on the primary reconnaissance. In addition, the following table summarizes the persons interviewed.

TABLE 1: SUMMARY OF VERBAL CONTACTS

Contact	Relationship to the facility	Title	Interview Date	Number
Jim Stanhope	EMC, LTVSMC and CE employee. (retired)	Environmental Engineering Supervisor	12/16/99	218/225-4242
Richard Erchul	EMC, LTVSMC and CE emloyee. (retired)	Staff Services Coordinator	5/02 – 7/02	218/2254263
Jim Scott	EMC and CCI	Manager of Operations		218/225-4217
Bruce Gerlach	CCI	Facility Manager	7/25/02	218/225-4261
Dave Youngman	EMC, LTVSMC and CE employee. (retired)	Lands Supervisor		218/2254223

EMC and LTVSMC performed areal surveys of various portions of the whole facility routinely. The following photographs were reviewed:

1. Chronoflex photos of the plant and tailings basin areas for the years 1979 through 2000 (scale of the photos are 1" = 1500' to 1' = 200'.
2. Photomosaics for the Hoyt Lakes and Taconite Harbor areas for the years 1948 and 1955.
3. Regular air photos for the years 1980 though1996.

The air photos were reviewed to determine if AOC exist that were not identified through other data sources. The air photos were not necessarily used to document changing conditions of the AOCs already identified. It is anticipated that air photos will be an important resource in preparation of SAPs.

Figure 2 presents the locations of each area within the Hoyt Lakes facility and Figures 3 through 12 provide details of each area along with the location of AOCs.

<u>AREA 1</u>

Area 1 is located at the northwest portion of the mine areas contains one of the largest open pits of the facility. The access road to the mine from State Highway 135 transects Area 1. The lands

south of the access road are generally forested while those south of the road are generally disturbed by the mining activity. The open pit was actively dewatered until 1987 and is currently filling with water. The water has reached a static level and is discharging through road grade at the southeast side of the area.

The Area 1 Shops (AOC-1, Figure 3) were visited during the reconnaissance. Figure 6 presents detail drawing of the Area 1 Shops. This area provided all the mining service support mentioned earlier in this report. Domestic waste water is connected to a septic tank and drain field system. Floor drains and other industrial waste water is contained and reused with residuals from oil water separators disposed of through outside services. A closed leak site exists for the fueling portions of the shops.

The Area1 West petroleum contaminated soil land application site (AOC-2, Figure 3) was visited and appears in good condition, no odors or staining were apparent. An area near the western extent of Area 1 where municipal waste water treatment plant sludge from Aurora and Hoyt Lakes was land applied (AOC-3, Figure 3) has no discernable impacts. The land application site has heavy brush and is located on a north facing slope. Sludge application was discontinued during approximately 1970s.

The 1004 Material and Equipment storage (AOC-4, Figure 3) is a lay-down area containing cable equipment, salvaged equipment and other materials. The area is on top of a waste rock stockpile. Several areas with soil staining were observed. The heaviest soil staining was observed in a portion of the area was used for salvaging equipment. A deep ravine borders the west edge of the 1004 area and contains large amounts of demolition debris, scrap metal and several barrels.

Several hundred feet east of the 1004 storage area is a demolition debris disposal area containing asphalt and rubber roofing material removed from various plant buildings (AOC-5, Figure 3). The roofing material was compacted with a loader or dozer during placement and buried with waste rock boulders. The material was observed commingled with the waste rock.

Interviews identified two areas that are not a portion of the permitted landfill, but are very close to the footprint. The first is an area were oily waste from floor drains in the general shops area was dumped at the land surface (AOC-6, Figure 3). This disposal was discontinued in 1980 when Berg Oil (currently OSI Environmental, Inc.) was contracted to accept the waste. The second area near the landfill reportedly received a one time disposal of heavy lubricant (bull gear grease) in the 1970s (AOC-7, Figure 3). No visible signs of the disposal were evident during the site inspection or on air photos reviewed.

The Private Landfill (AOC-3, Figure 8) was a permitted (SW-17) industrial waste landfill that operated until 1993. The landfill has gone through routine hydrogeologic investigation as required by Minnesota Solid Waste Rules. Five monitoring wells installed around the perimeter of the landfill are currently monitored once per year with routine quarterly inspections of the cover. Hydrogeologic evaluation documents as well as annual monitoring reports are available

for the landfill. During the site reconnaissance, the cover and vegetation appeared to be in good condition.

The Rail Panel Yard (AOC-9, Figure 3) is located near the northeast portion of Area 1 and originally was an area where railroad panels were constructed. Railroad panels are sections of rail and ties prefabricated to allow temporary rail lines to be constructed to a blast site for loading of ore directly onto railcars. This practice was discontinued when loading pockets were constructed. Areas near the perimeter of the panel yard contain large volumes of railroad ties. The ties are typically buried with waste rock. Several of the disposal areas contain comingled waste including scrap metal, wood, and other demolition and industrial waste. The panel yard has also been used as a general laydown area with equipment in various stages of demolition. Areas of soil staining are evident.

The Airport (AOC-10, Figure 3) is an area immediately south of the Panel Yard. The name Airport was adopted because it is where abundant equipment and materials "landed" after they were no longer serviceable. Currently most of the materials and equipment have been salvaged. However, several pieces remain. Areas of soil staining are evident throughout the Airport.

Several hundred feet south of the Airport is a coal ash disposal area (AOC-11, Figure 3). The ash was generated from the old stoker coal fired heating plant. The disposal was discontinued in the 1980s when ash was used to cover the private landfill. The heating plant was converted to natural gas in 1994. The coal ash contains only marginal cover.

An area containing large volumes of solid waste, generated from cleaning the concentrator building, is located at the extreme northeast boundary of Area 1 (AOC-12, Figure 3). The solid waste contains ore concentrate, wood, scrap metal, and what ever else was cleaned out of the concentrator building. The waste is not covered.

AREA 2, 2E AND 3

This area lies near the eastern extent of the Hoyt Lakes facility and contains significantly less infrastructure and areas of potential concern than Area 1. The Dunka Road and the Taconite Harbor railroad corridor exit the Hoyt Lakes facility through this area.

At the far northern boundary of this area is the 2001 Material and Equipment Storage Site (AOC-13, Figure 4). Various types of equipment and materials, including transformers, were observed in this area with several areas of soil staining.

Near the northwest boundary of Area 2,2E and 3 is a facility for sandblasting and painting locomotives and railcars (AOC-14, Figure 4). The facility consists of an open sided roofed structure with rail line entering, a sand hopper, and several storage buildings and compressor building. A buildup of blasting sands is evident.

Near the western boundary of Area 2,2E and 3 is a railroad siding that is a designated railroad equipment storage area (AOC-15, Figure 4). Several locomotives and various other small equipment were observed in this area. Soil staining appeared to be limited to the siding tracks.

The Area 2 loading pockets were observed. One pocket is a vibratory (AOC-16, Figure 4) and one pocket is a superpocket (AOC-17, Figure 4). Small amounts of hydraulic oil stained soil was observed near the superpocket. A truck fueling station is also located in this area.

A building for storage of solid blasting materials is located near the east end of this area. However, materials were containerized and no evidence of a release was identified.

AREA 2W

Very little infrastructure exists in Area 2W and no AOC were identified. Reporting, truck fueling and loading for Area 2W was done at Area 2. The mainline rail corridor forms the eastern and northern boundary.

The Missabe Location existed in Area 2W but is not considered as a concern since large volumes of overburden and rock have been mined from the former location.

AREA 2WX

This is the most recently developed mining area and contains both a vibratory loading pocket (AOC-21, Figure 5) and a superpocket (AOC-22, Figure 5). Both were observed during the site reconnaissance. A small lube station exists near the super pocket. A truck fueling station is located immediately south of the loading pockets and is constructed with a roof and containment structures as previously described (AOC-20, Figure 5). The reporting area (AOC-18, Figure 5) includes an area for materials and equipment storage where several patches of soil staining were observed. A well, septic tank and drain field system remain in place. Finally, a shovel was dismantled by scrap dealers in an area west of the loading pockets (AOC-19, Figure 5) where soil staining was observed.

AREA 5

This area is the most northern of the mining areas at the Hoyt Lakes facility and contains the headwaters of Wyman Creek. Most of the eastern half of the area has undergone mine land reclamation and is covered with vegetation. Truck fueling in Area 5 was accomplished with mobile AST.

The reporting area (AOC-23, Figure 6) includes a scrap and salvage area where some stained soil was observed. Most of the scrap has been removed. A well, septic tank and drain field system remain in place.

The Area 5 vibratory loading pocket was observed (AOC-24, Figure 6). No soil staining was apparent in this area. However, the rail line to the loading pocket contains a siding where rail cars and locomotives have been stored. Some stained soils was observed along the siding.

AREA 6, AREA 9N AND AREA 9S

These areas comprise the southwest portion of the mining areas and are discussed here collectively. Of most significance is the location of Pre-Tac (AOC-28, Figure 9) which was located on the western edge of Area 9N. The plant was demolished in the late 1950s and the only observable evidence of the plant today is some concrete slabs and foundations Figure 19 shows a drawing of the plant, although features on the drawing are not labeled. The location is currently only accessible by ATV or foot.

The former Area 1 west reporting area was actually located in the northern section of Area 9N. This area is also only accessible by a ATV or foot. No observable environmental conditions were noted at this site however, a septic system was associated with this reporting area.

The Area 9 loading pocket (AOC-29, Figure 9) is a vibratory type. The Area 6 and Area 9 reporting area has a septic tank and drain field system in place. The former Aurora City Dump (AOC-27, Figure 8) was located at the west boundary of Area 9S. The majority of the dump was reported as removed during mining of Area 9S. However some scrap wood, cans and litter are observable today. The removed waste was placed into Stockpile #9021(AOC-29, Figure 8).

The Evergreen Trailer Park was located within this area. The trailer park contained mobile homes and presumably had wells and septic systems. The only evidence of the trailer park today are remnants of roads and non-indigenous shrubbery.

PLANT AND PROCESSING AREA

The tailings basin portion of the plant and processing area is a large earth dike structure with road access along the top of the lifts. Tailings are discharged as a slurry with process water. The design of the dikes allows the tailings to settle and the process water to be recycled back to the plant. The Colby Lake pumping station provides process water to offset any losses due to seepage, evaporation and water loss up the furnace stacks. Several pumping stations are located in the tailings basin and several transformers exist (AOC-46, Figure 11). CE records indicate that these transformers currently contain non-PCB mineral oil. An area within Cell 2W contains buried hornfels (AOC-51, Figure 11). The hornfels is a waste rock type containing sulfide minerals. Monitoring wells are installed surrounding the hornfels burial site and are monitored as part of the NPDES permit. The tailings basin reporting (AOC-45, Figure 11) is located at the road access point. This reporting area contains a lube station. In addition, two UST were removed in 1988 and a septic tank and drain field system remain in place.

Several other notable features surround the tailings basin dikes. An area immediately west of the tailings basin reporting contains several small equipment and materials storage locations(AOC-49, Figure 11). Most of the salvageable materials are gone. However several soil stained areas

were observed. The basin 2W salvage area (AOC-50, Figure 11) is located along the western edge of the tailings basin. Salvage operations are evident with several small soil stained areas as well the remains of a mobile AST containing Choherex, a petroleum based dust suppressant.

The eastern margins of the tailings basin contains an area where water treatment plant sludge from the Dunka active treatment plant was staged (AOC-33, Figure 11). The sludge has been shipped offsite and little evidence of it's existence were observed.

A coal ash landfill (AOC-34, Figure 11) is located south of the sludge staging area. The coal ash was generated at the Taconite Harbor power plant and shipped back to Hoyt Lakes on rail cars. The landfill cover appears in good condition. Inspection of the cover is conducted as part of NPDES requirements.

The line 9, area 5 permitted petroleum land application site (AOC-35, Figure 11) is located adjacent east of the tailings basin. This land application site contains approximately 25,000 cubic yards of soil from the Area 1 Shops tank farm cleanup and the Knox fueling station cleanup. The site appears in good condition. Monitoring data is available.

The Area 2 shops (AOC-36, Figure 11) were visited, this area was the primary shops for the eastern mining areas and currently contains a fueling station for the in-mine locomotives. A Septic Tank and drain field remain in place.

The Knox mainline railroad fueling station (AOC-37, Figure 11) contains one AST. Containment structures are provided below the dispenser lines.

The Old Heavy Duty Garage (AOC-38, Figure 11) is located on a hill adjacent to the plant site proper. The facility has been used only for cold storage since approximately 1960. However, it was previously used for equipment maintenance and one USTs has been removed near the facility.

The old oxygen plant (AOC-39, Figure 11) produced oxygen through a series of ambient air compressions. The oxygen was used in drilling. With the introduction of more modern drilling methods the oxygen use was phased out. Several UST have been removed from the oxygen plant.

The pellet plant Bunker C Tank Farm (AOC-40, Figure 11) is currently being investigated under the LUST program (Leak #12254). The finished pellet and loadout area (AOC-43, Figure 11) is a large flat surface with little notable features. However, the rail line that access the loadout facility contains appreciable soil staining and heavy oil residue in an adjacent ditch.

The Administration Building (AOC-41, Figure 11)did not have any notable features. However, one heating oil UST was abandoned in place. Domestic waste was pumped to the plantsite WWTP. After shutdown of the plant site, the administration building is still active. Therefore, a new well and septic system were installed in 2001. Several hundred feet from the administration

building is the Maingate Fueling Station (AOC-42, Figure 11). The station consists of several AST used for fueling light trucks.

The plant site proper (AOC-44, Figure 11)is considered the core of the plant and processing area where the taconite process was conducted. Figure 15 provides detail of the infrastructure of the plant itself.

The Colby Lake Pumping Station (AOC-58) is located distant from the plant area but provides process and drinking water to the plant and therefore is considered part of the plant infrastructure. The pumps and associated equipment are located within a large block and metal sided building. One heating oil AST was removed in approximately 1970 when natural gas became available. The concrete pedestals for the AST remain. The pumps are electric and an associated transformer is located adjacent to the building.

AREA 8 (DUNKA)

The Dunka Mining area is remote from the other mining areas and the plant. A railroad corridor provided shipping of ore back to the plant site. Since the area was remote from the rest of the facility, a shops area (AOC-30, Figure 10) was constructed as previously mentioned. The shops were demolished in 1998 and the area has been covered and seeded. A closed leaksite exists in association with the Dunka shops.

A north and a south loading pocket (AOC-31 and AOC-32, Figure 10) existed at Dunka, each had fueling system in the past. Reporting areas had well and septic systems which were abandoned.

The geology of the Dunka pit is different from the remaining mining areas in that the taconite re is in close proximity to the Duluth Complex. This association produced a zone of sulfide rich rocks which have been the subject of exploration for metals other than iron. Some of the sulfide mineral containing rocks have been removed and placed in stockpiles. Groundwater seeps that discharge from the stockpiles have elevated concentrations of several meals and low pH. A full scale metals water treatment has been constructed. In addition, wetland treatment systems have been constructed at each of the identified seeps. Since this condition is regulated through the NPDES permit, no addition scrutiny of the seeps is recommended as part of this Phase I. The water treatment plant is powered by electricity. No fuel tanks were identified associated with the treatment plant building.

TACONITE HARBOR

REGIONAL GEOLOGY AND HYDROGEOLOGY

A very thin layer of glacial drift may overlie volcanic bedrock, although bedrock is exposed at the ground surface throughout much of the Taconite Harbor Area. The drift is a red-brown, clay to silty clay. The volcanic bedrock is part of the Northshore Volcanic Group; a thick sequence of

southeast dipping lava flows. The local members of the lava flows are named the Schroeder Basalt.

Taconite harbor lies within the Lake Superior Water shed where surface water flow is southeast toward Lake Superior. The thin drift may support a local groundwater flow system over the bedrock. If local flow occurs, discharge is typically at creeks, seeps or leakage to the bedrock flow system. Groundwater flow within bedrock occurs in fractured basalt or within inter-flow sediments. The fracture flow systems tend to be somewhat isolated from one another, often with dead-end flow (no discharge). Where, fracture zones are hydraulically connected, intermediate groundwater flows is southeast, toward Lake Superior.

ENVIRONMENTAL RECORDS REVIEW

An Area Study Report was received from EDR and is attached in Appendix D. There were seven sites listed in the report that had sufficient information to locate on a map of the search area.

1. The Taconite Harbor Power Plant was listed under the Emergency Response Notification System (ERNS) records. This site is not within the boundaries of this phase and is currently owned by MP.
2. The Taconite Harbor Power plant was listed under the state LUST database. This site is not within the boundaries of this phase and is currently owned by MP.
3. Three listings were found under the MN Spills database that contain sufficient information to attribute the spill to the power plant.
4. Two listings were found under the MN Spills database that did not have sufficient information to determine where the spill occurred.

The Orphan summary in the EDR report lists all sites that may be within the area search boundaries based upon common location descriptions, but cannot be adequately located. Review of the Orphan Summary did not find any sites attributable to the CE facility.

INTERVIEWS, ON-SITE RECONNAISSANCE AND ARIAL PHOTO REVIEW

The Taconite Harbor docks and a marine fueling facility were inspected on July 25, 2002. The Marine Fueling Facility consists of two Large AST (AOC-53, Figure 12) and associated lines and pump house are currently being addressed under the LUST program (Leak #12252).

The “Oil Track” (AOC-53, Figure 12) is a siding off the main rail line where fuel oil was off loaded from rail car to the ASTs. The Oil track was not used for off loading oil after approximately 1970. However, some buildup of heavy lubricants and oil was observed along the track grade. In addition, one mobile AST, used for fueling light track vehicles existed adjacent to

the grade and some demolition debris and waste soils piles were observed adjacent to the track grade.

RAILROAD CORRIDOR AND MURPHY CITY

REGIONAL GEOLOGY AND HYDROGEOLOGY

The Railroad Corridor transects a remote portion of Northeast Minnesota and three seperate watersheds. The Corridor begins at Hoyt Lakes which lies within the St. Louis River Watershed and enters the Rainy Lake Watershed in T.59N, R.11W. Finally the railroad enters the Lake Superior Watershed in about T.58N, R.9W. Murphy City lies within the Lake Superior Watershed.

Bedrock geology at the western end of the corridor is shown on Appendix G and consists of the Animikie Group which contacts the Duluth Gabbro several miles east of the Hoyt Lakes facility. This contact between the Duluth Gabbro Complex and the Animikie Group has been extensively explored for non-ferrrous metal reserves. The corridor is underlain by the gabbro as it extends eastward. The Northshore Volcanic sequence as previously described, underlies the eastern sections of the corridor.

Glacial drift varies in thickness accross the corridor ranging from several feet on the eastern end to more than 100 feet on the mid sections of the corridor. The deposits tend to be sandy to stony till ranging in color from brown on the western end to red-brown on the eastern end. Peat and sandy glacial outwash is common on the western portions of the railroad

ENVIRONMENTAL RECORDS REVIEW

A database search of standard environmental records was not obtained for the railroad corridor or Murphy City.

INTERVIEWS, ON-SITE RECONNAISSANCE AND ARIAL PHOTO REVIEW

The entire corridor from the Hoyt Lakes facility to taconite Harbor was inspected on July 25, 2002. In general the railroad corridor contained few notable environmental conditions. Occasional railroad ties are discarded along the corridor and switches contain mall areas with lubricant build-up on the ballast. However, this material is limited to the area immediately surrounding the switches. Near the Taconite Harbor end of the corridor, large curves exists in the track with rail lubricators installed at each curve (AOC-57, Figure 12). Rail lubricators also exist along the rail corridor east of Murphy city in the general vicinity of mile marker 55. Some buildup of the grease on the ballast was observed at these locations. Several Battery Houses were observed with all batteries removed. These are small structures containing batteries that operate signals, detectors and electrical switches. The batteries are recharged with solar panels. No indications of a release were observed around the battery houses.

Murphy City (AOC-56, Figure 16) consists of four main buildings; a repair building, storage building, lubricant oil storage and reporting building. The repair building was used for light service on track maintenance equipment, soil staining was evident along the tracks leading into the repair building. A well and septic system are associated with the reporting building. The oil storage building has a wood floor and contains some surrounding stained soil. Two UST were removed from the Murphy City facility in the 1990s and replaced with two AST. These tanks are listed in Table 2 and 5. A laydown area for various wood, scrap metal, rails and railroad ties is located adjacent to the rail siding entering the facility, In addition a small pile of general demolition waste is located in the laydown area. Figure 9 presents a detail drawing of Murphy City.

CONCLUSIONS

NTS has performed this Phase I Environmental Site Assessment of the CE Facility in general conformance with the scope and limitations of ASTM Practice E 1527-00 as well as VIC Guidance document # 8. Uniqueness' in the methodology are described in the Limitations and Methodology section of this report. This report uses the term Area of Concern (AOC) as a discrete area of the property where a known release, or a material threat of a release is identified by the level of inquiry provided by this document. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject or an enforcement action if brought to the attention of appropriate governmental agencies.

NTS has identified 56 AOC which are summarized in Table 6. NTS recommends that CCI determine a prioritization of the AOC and prepare a Quality Assurance Plan (QAP) which outlines the phase II methods and decision process. Following VIC Staff approval of the QAP Sampling and Analysis Plans (SAP) should be prepared to address the AOCs. Each SAP should contain sufficient detail on the process and waste stream associated with the AOC. This detail should be used to develop a sampling strategy in accordance with the MPCAs Draft Risk Base Site Characterization and Sampling Guidance.

REFERENCES

Meinike, D.G., Buchheit, R.L., Dahlberg, E.H., Morey, G. B., Warren, L.E., 1999, Geologic Map Mesabi Iron Range, Minnesota, Second Edition.

Morey G.B., 1993, Geology of the Mesabi Iron Range: Institute on Lake Superior Geology Procedings, 39 Annual Meeting, Eveleth, MN, 1993, v.39, part 2, p1-18.