THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

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Fairbanks, AK 99709-3643
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File: 190.38.002

December 7, 2015

Kristin Hess, Realty Chief
Alaska Department of Natural Resources
Division of Mining, Land, & Water
550 West 7th Avenue, Suite 1050A
Anchorage, AK 99501

Larry Beck, Environmental Protection Specialist
BLM Anchorage Field Office
4700 BLM Road
Anchorage, AK 99507

Re: Decision Document for BLM Maclaren Glacier Mine Dump Site
Cleanup Complete Determination

Dear Ms. Hess and Mr. Beck:

The Alaska Department of Environmental Conservation (ADEC) has reviewed the environmental records for the Bureau of Land Management (BLM) Maclaren Glacier Mine Dump site. This decision letter memorializes the site history, cleanup actions, and standard conditions for long-term site management. No further remedial action is required.

Site Name and Location
BLM Maclaren Glacier Mine Dump Site
90 miles north-northwest of Glennallen
South ½ of Section 11 and north ¼ of Section 14, Township 19 South, Range 6 East, Fairbanks Meridian

Landowner
State of Alaska, Department of Natural Resources

DEC Site Identifiers
File No: 190.38.002
Hazard ID: 1701

Regulatory Authority for Determination
18 AAC 75

Site Description and Background

The BLM Maclaren Glacier Mine Dump Site is an abandoned copper mine located in the Maclaren River Valley, near terminus of the Maclaren Glacier on the south side of the Alaska Range (Figure 1). The mine was active from the early 1950s to the 1960s. The site includes a collapsed copper mine adit, a pond, an abandoned mine camp and two gravel airstrips that were used to access the site. During operation, ore was transported from the adit to the camp, then placed into 55-gallon drums and flown out for processing.

Ownership of this site was transferred from the BLM to the State of Alaska in 2007.

Contaminants of Concern and Cleanup Levels

Contaminants of concern for this site were identified as diesel range organics (DRO) and benzene. Alternative cleanup levels were developed for this site under 18 AAC 75.340(e)(2). The Maclaren Glacier Mine Site Alternative Cleanup Levels Record of Decision (July 2000, enclosed) provides the site specific data used to calculate the following cleanup levels:

Cleanup Levels

Contaminant	Soil
DRO	1,100 mg/kg
Benzene	0.03 mg/kg

mg/kg = milligrams per kilogram

Characterization and Cleanup Activities

In 1990, C.C. Johnson and Malhortra, P.C. conducted a preliminary assessment of the site for BLM. During the preliminary assessment, the contractor identified over one hundred 55-gallon drums at the site. Drums and debris were concentrated at the mine camp area, the shed area, the mine adit, and the landing strip. Stained soil and a petroleum odor were observed at the mine camp.

Harding Lawson Associates/Wilder Construction (HLA/Wilder) performed debris removal and site characterization activities at the site in 1999. They removed and properly disposed of 220 drums, 18.5 tons of metallic debris and construction material, and 800 gallons of drum liquids. Wood debris was burned and the ash buried on site.

The 1999 site characterization activities included collecting soil and surface water samples. Twenty five soil samples were collected from eight areas of concern at the site and analyzed for gasoline, diesel, and residual range organics (GRO, DRO, and RRO), volatile organic compounds (VOC's), polynuclear aromatic hydrocarbons (PAHs), and metals. Sample results show DRO and benzene above the cleanup level at the mine camp area. Results for some of the metals exceeded the cleanup levels, however the concentrations were determined to be representative of background levels. Seven surface water samples were collected from upgradient and downgradient locations across the site. Surface water samples were analyzed for benzene, ethylbenzene, toluene, and xylenes (BTEX), total aqueous hydrocarbons (TAqH), and metals. BTEX and TAqH results were below the water quality criteria. Copper was detected above the water quality criteria in upgradient and downgradient locations, however this is attributed to naturally occurring copper in the area.

HLA/Wilder returned to the site in to perform remedial actions in 2000. Approximately 730 cubic yards of petroleum impacted soil was removed from 5 areas of concern at the mine area. Soil samples were collected from the limits of the excavations and analyzed for GRO or DRO,

depending on the area of concern, and BTEX. All results were below the cleanup levels. A sheen was observed on 40% – 50% of the groundwater encountered at the bottom of excavation E-1. Three downgradient test pits were excavated to determine the lateral extent; no sheen was observed in the downgradient test pits. Soil and water samples were collected from the smear zone of each test pit and excavation E-1 and analyzed for GRO and BTEX. Results were non-detect for all analytes.

The excavated soil was treated with 450 pounds of fertilizer and placed in two landspread areas for treatment. Soil samples from the landspread soil were collected and analyzed for DRO, with a maximum result of 13,100 mg/kg. In October 2001, the contractor returned to the site and collected additional samples from the landspread soil. The maximum result for DRO was 3,900 mg/kg.

In 2013, BLM contracted Marsh Creek, LLC to conduct soil sampling at the landspread areas. Marsh Creek collected multi-incremental soil samples from the two landspread areas and submitted the samples for analysis of DRO. Results are below the migration to groundwater cleanup level of 250 mg/kg.

Cumulative Risk Evaluation

Pursuant to 18 AAC 75.325(g), when detectable contamination remains on-site following a cleanup, a cumulative risk determination must be made that the risk from hazardous substances does not exceed a cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways and does not exceed a cumulative noncarcinogenic risk standard at a hazard index of one across all exposure pathways.

Based on a review of the environmental record, ADEC has determined that residual contaminant concentrations do not pose a cumulative human health risk.

Exposure Pathway Evaluation

Following investigation and cleanup at the site, exposure to the remaining contaminants was evaluated using ADEC's Exposure Tracking Model (ETM). Exposure pathways are the conduits by which contamination may reach human or ecological receptors. ETM results show all pathways to be one of the following: De-Minimis Exposure, Exposure Controlled, or Pathway Incomplete. A summary of this pathway evaluation is included below:

Exposure Pathway Evaluation

Pathway	Result	Explanation
Surface Soil Contact	De Minimis Exposure	Residual contamination concentrations in surface soil are below cleanup levels.
Sub-Surface Soil Contact	De-Minimis Exposure	Residual contamination concentrations in subsurface soil are below cleanup levels.
Inhalation – Outdoor Air	De-Minimis Exposure	Residual contamination concentrations are below inhalation cleanup levels.
Inhalation – Indoor Air (vapor intrusion)	Pathway Incomplete	No buildings are present on the site.
Groundwater Ingestion	Pathway Incomplete	Groundwater sample results are below cleanup levels.
Surface Water Ingestion	Pathway Incomplete	Surface water sample results are below cleanup levels.

Wild and Farmed Foods Ingestion	Pathway Incomplete	Contaminants of concern do not have the potential to bioaccumulate in plants or animals.
Exposure to Ecological Receptors	Pathway Incomplete	Contaminants of concern do not have the potential to bioaccumulate in plants or animals.

Notes to Table 2: "De-Minimis Exposure" means that in ADEC's judgment receptors are unlikely to be affected by the minimal volume or concentration of remaining contamination. "Pathway Incomplete" means that in ADEC's judgment contamination has no potential to contact receptors. "Exposure Controlled" means there is an administrative mechanism in place limiting land or groundwater use, or a physical barrier in place that deters contact with residual contamination.

ADEC Decision

Remaining petroleum contamination in soil is below approved cleanup levels. This site will receive a "Cleanup Complete" designation on the Contaminated Sites Database, subject to the following conditions:

1. Any proposal to transport soil or groundwater off-site requires ADEC approval in accordance with 18 AAC 78.600(h). A "site" [as defined by 18 AAC 75.990 (115)] means an area that is contaminated, including areas contaminated by the migration of hazardous substances from a source area, regardless of property ownership. (See attached site figure.)

2. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.

This determination is in accordance with 18 AAC 75.380 and does not preclude ADEC from requiring additional assessment and/or cleanup action if future information indicates that this site may pose an unacceptable risk to human health or the environment.

Appeal

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Division Director, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 15 days after receiving the department's decision reviewable under this section. Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days after the date of issuance of this letter, or within 30 days after the department issues a final decision under 18 AAC 15.185. If a hearing is not requested within 30 days, the right to appeal is waived.

If you have questions about this closure decision, please contact me at melody.debenham@alaska.gov or (907) 451-5175.

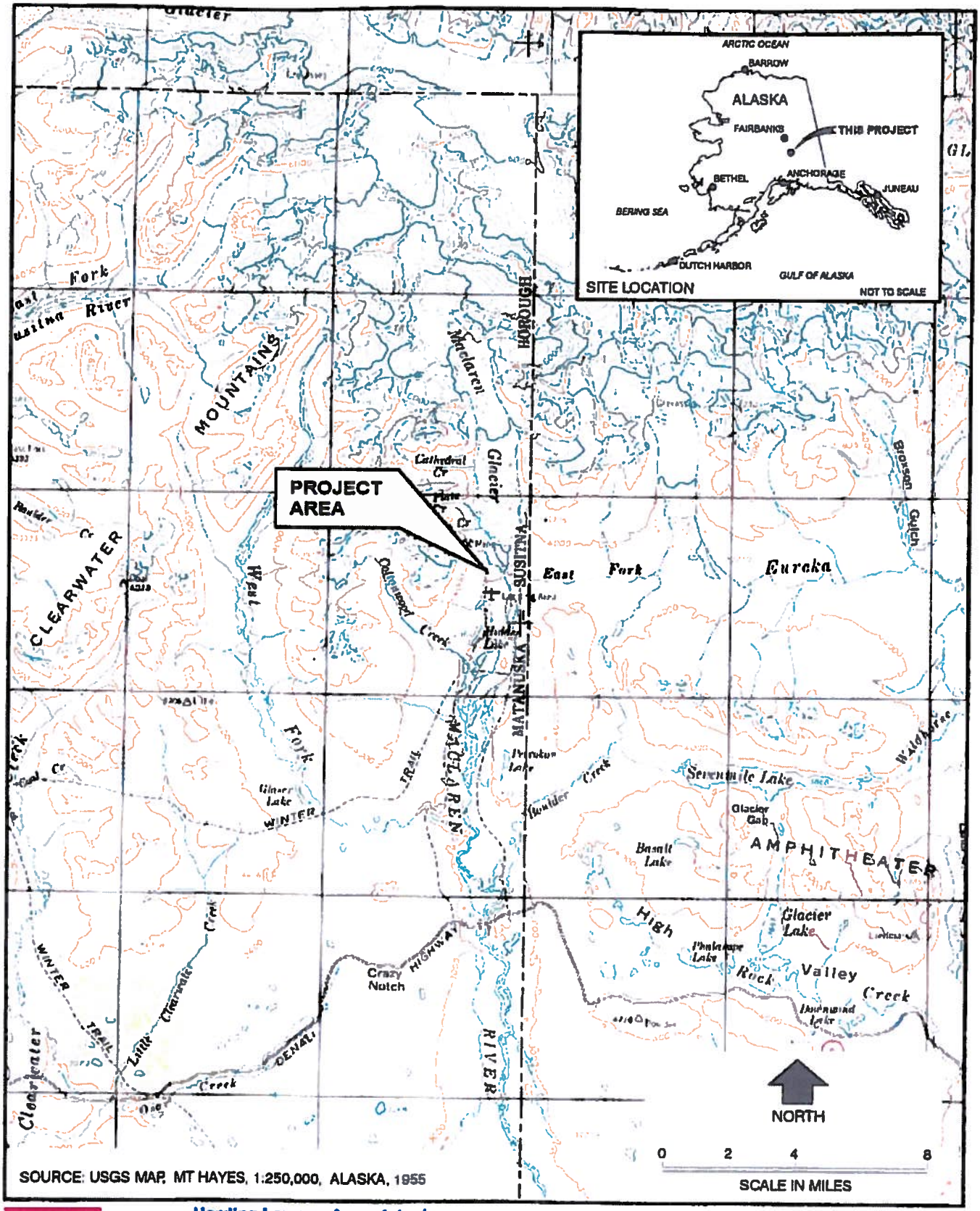
Sincerely,

Melody Debenham
Environmental Program Specialist

Enclosures:

Figure 1 - Site Location and Vicinity Maps (HLA/Wilder, 2001)
Figure 2 – Site Map (HLA/Wilder, 2001)
Figure 3 – Proposed Excavation Areas, Mine Camp Areas C, E, and F (HLA/Wilder, 2001)
Figure 4 – Excavations, Land Farms, and Sample Locations (HLA/Wilder, 2001)
Maclaren Glacier Mine Site Alternative Cleanup Levels Record of Decision (ADEC, 2000)
Maclaren Glacier Mine Dump Site – Cleanup Complete Letter (ADNR, 2015)
Landowner Concurrence Signature Page (BLM and ADNR, 2015)

cc: Sean O'Guinn, Natural Resource Specialist, Division of Mining, Land & Water
Clark Cox, Regional Manager, Southcentral Land Office, Division of Mining, Land & Water



SOURCE: USGS MAP, MT HAYES, 1:250,000, ALASKA, 1955

HLA WILDER

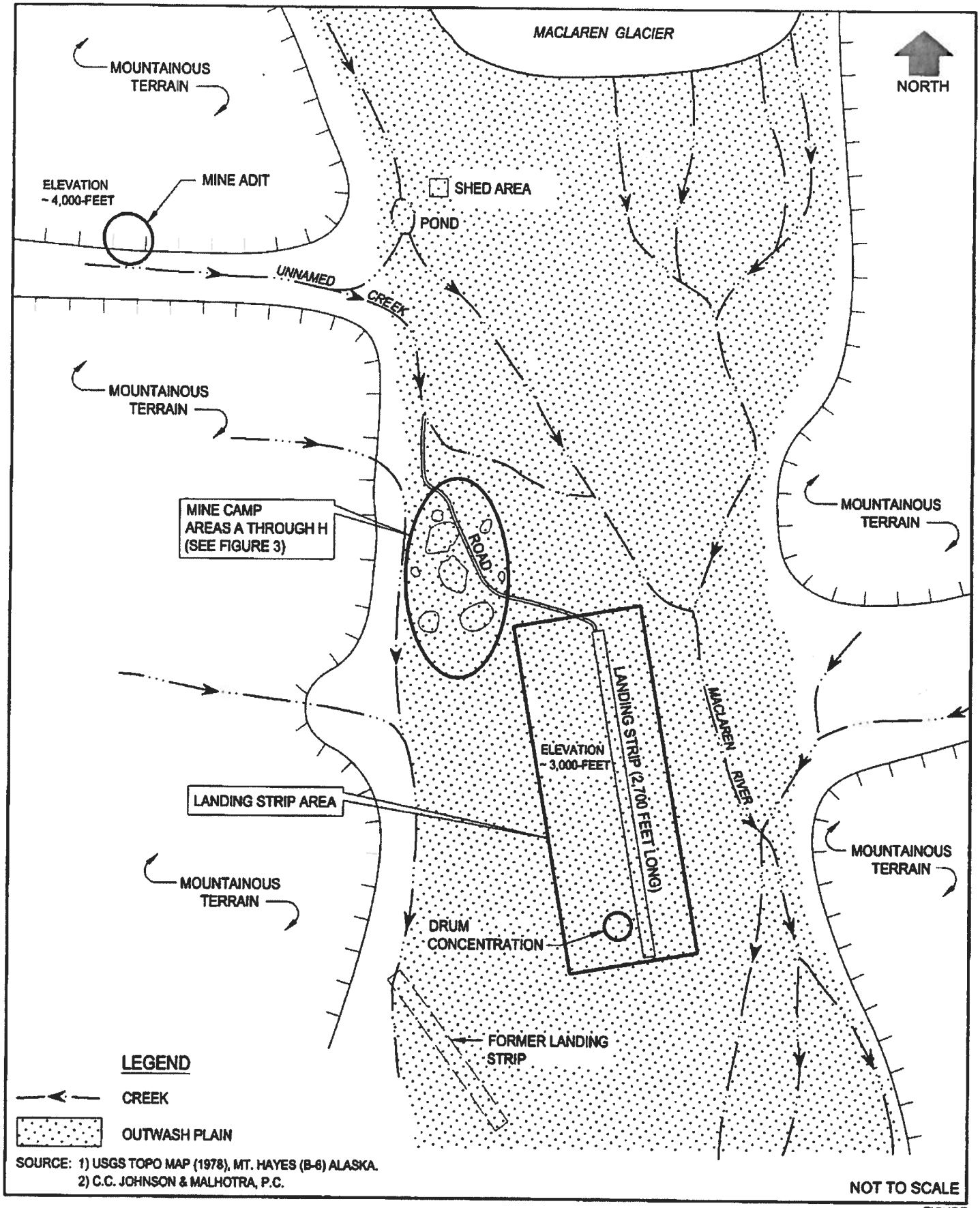
Harding Lawson Associates/
Wilder Construction Company
Joint Venture

Site Location and Vicinity Maps

Maclaren Glacier Mine
Maclaren Glacier, Alaska

FIGURE 1

DRAWN	PROJECT NUMBER	APPROVED	DATE	FILE NAME
JP	47559	MF	11/99	452c



SOURCE: 1) USGS TOPO MAP (1978), MT. HAYES (B-6) ALASKA.
2) C.C. JOHNSON & MALHOTRA, P.C.

NOT TO SCALE

HLA WILDER

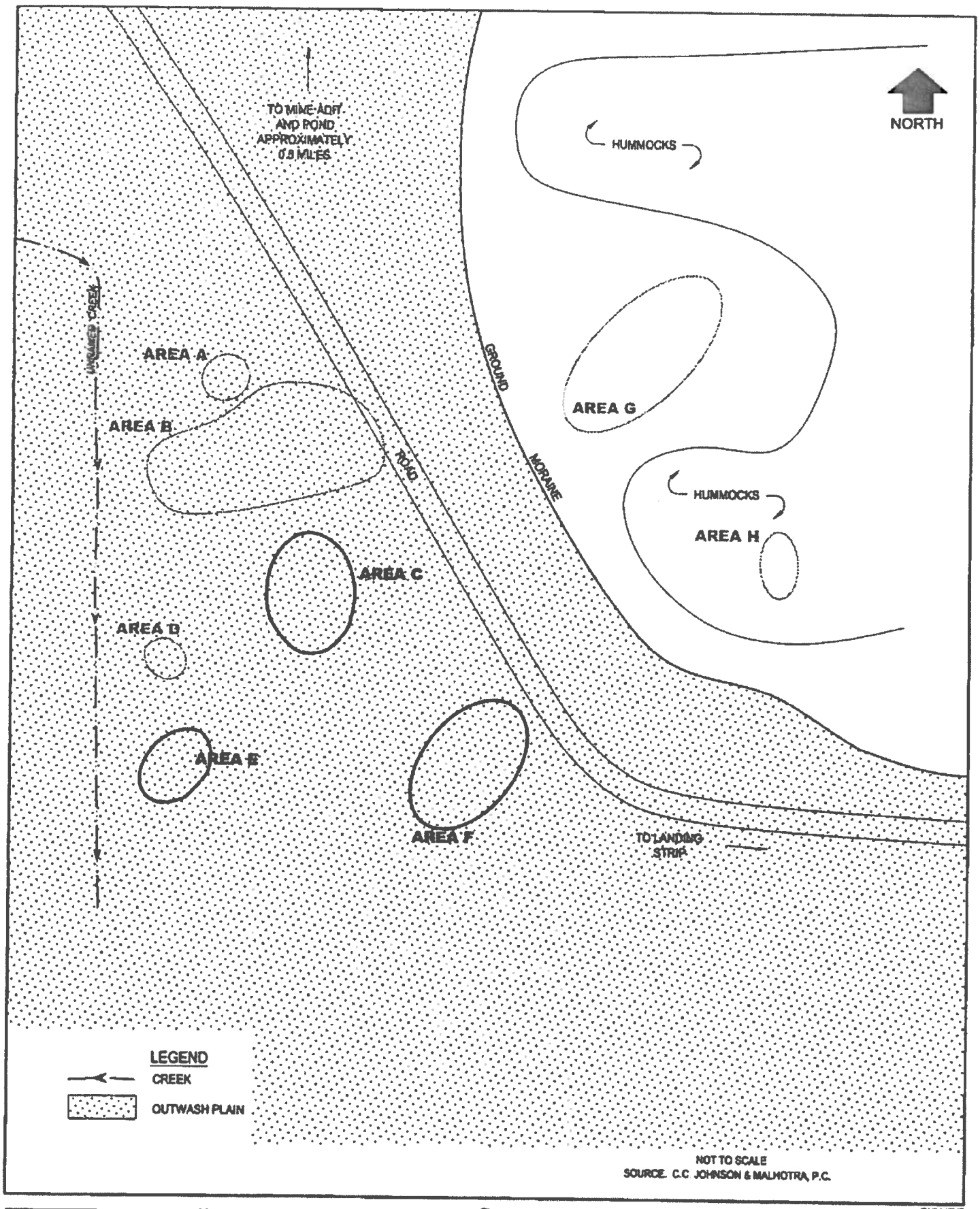
Harding Lawson Associates/ Wilder Construction Company
Joint Venture

Site Map

Maclaren Glacier Mine
Maclaren Glacier, Alaska

FIGURE **2**

DRAWN	PROJECT NUMBER	APPROVED	DATE	FILE NAME
CEH	47559	EL	11/00	47559b2.dwg



HLA WILDER

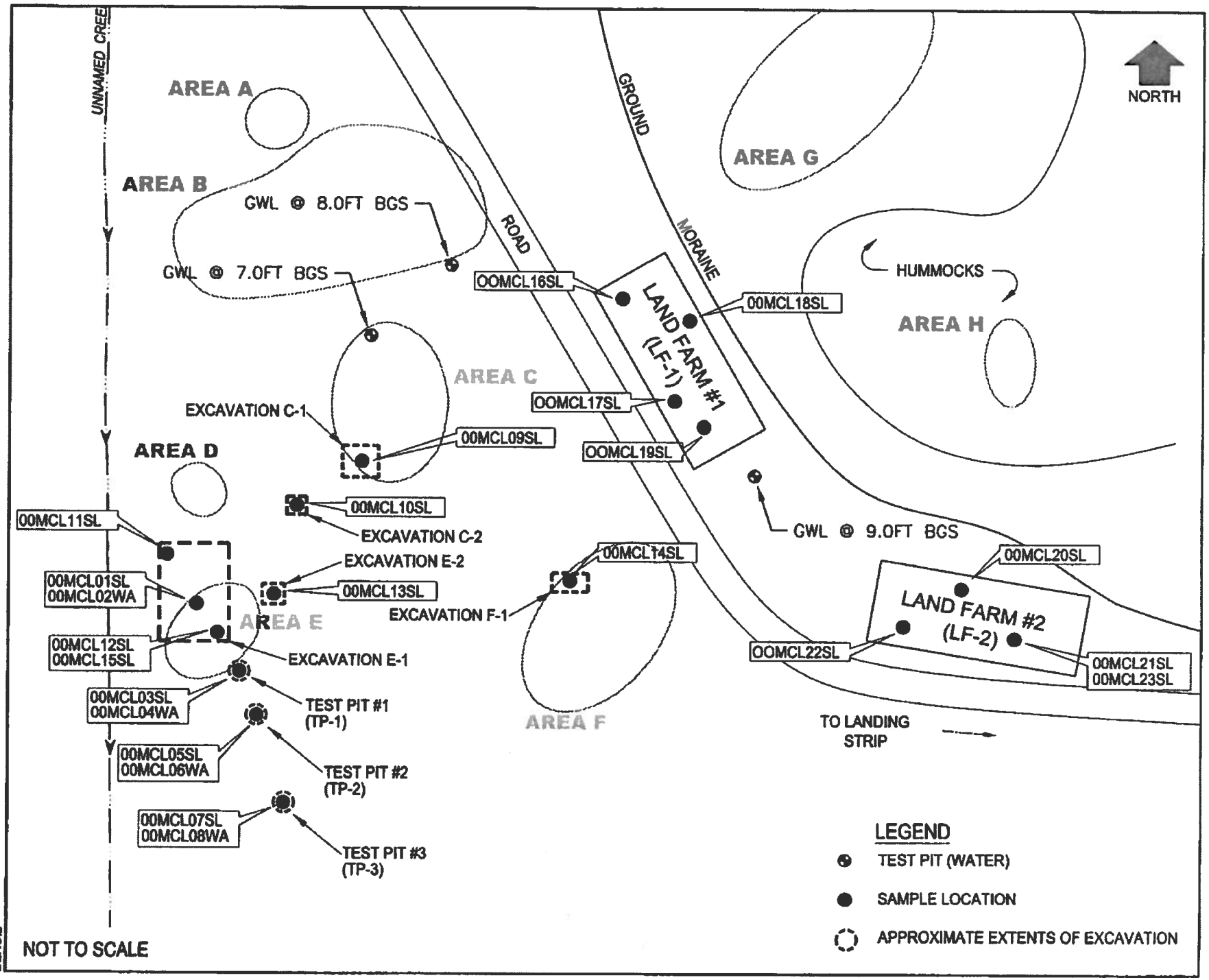
Harding Lawson Associates/ Wilder Construction Company
Joint Venture

Proposed Excavation Areas
Mine Camp Areas C, E, and F

Maclaren Glacier Mine
Maclaren Glacier, Alaska

FIGURE
3

DRAWN	PROJECT NUMBER	APPROVED	DATE	FILE NAME
EL	47559	EL	11/00	47559b3.dwg



Excavations, Land Farms, and Sample Locations

Macaren Glacier Mine
Macaren Glacier, Alaska

Harding Lawson Associates/
Wilder Construction Company
Joint Venture

DRAWN	PROJECT NUMBER	APPROVED	DATE	FILE NAME
EL	47559		11/00	47559b3.dwg

FIGURE 4

Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Remediation Program

File Number: 190.38.002
Database Record Key: 1992330934202

Maclaren Glacier Mine Site
Alternative Cleanup Levels
Record of Decision

Site Information

The Maclaren Glacier Mine Site was a former copper mine near the Maclaren Glacier on the south side of the Alaska Range. It is located in a remote part of interior Alaska, approximately 90 miles northwest of Glennallen, and 10 miles north of the Denali Highway. The specific location of the site is the South ½ of Section 11, Northeast ¼ of Section 14, Township 19 South, Range 6 East, Fairbanks Meridian. Approximate geographical coordinates of the site are 63°16'60" North Latitude and 146°31'45" West Longitude. The site was a copper mine in the 1950's and early 1960's, but was later abandoned. The site contained a collapsed mine adit, an area of collapsed buildings and debris which was once the mine camp located on the glacial outwash plain, and two gravel air strips which were used to access the site. The site is owned by the Bureau of Land Management (BLM).

Soils in the area consist of mainly silt, sand, and gravel deposited by glacial activity. Groundwater flow is presumed to be to the east and south, following the direction of surface water flow and topography. The nearest drinking water well is located approximately 10 miles from the site, at the Maclaren Lodge, located on the Denali Highway.

Site History

The copper mine was active from the early 1950's to the early 1960's. There is no evidence that the mine has been used since that time. During operation, ore was transported from the mine adit and shallow trenches to a base camp approximately ½ mile southeast of the adit. From there, the ore was placed into 55-gallon drums and flown out for processing. Several 55-gallon metal drums and debris were scattered across the site with a majority of the drums and debris concentrated in the areas listed below.

Mine Camp
Shed Area
Mine Adit
Landing Strip

The mine camp had the highest concentration of drums and debris. Removal of the drums and debris was conducted September 20 through October 2, 1999. Approximately 18.5 tons of metallic debris and construction materials were transported to the Fairbanks North Star Borough

(FNSB) Landfill for disposal. Following sampling results from the drums, approximately 800 gallons of drum liquids were transported to Energy Recovery Systems, Inc. (ERS) for treatment.

During a Preliminary Assessment (PA) in 1990 several legible labels were noted on the on-site drums, including the following: Stoddard Solvent, JP-4 Fuel Aircraft and CALOL. Evidence of leakage from several of the drums was observed during the PA; stained soils observed adjacent to the deteriorating drums had a slight fuel oil odor.

Based on the information from the 1990 PA, the evidence of leaking barrels and stained soils, a site characterization was done on the site in the summer of 1999.

Site Characterization

Site characterization activities were conducted on the site July 6 through July 10, 1999. After field screening using a photoionization detector (PID), 25 soil samples were collected at 13 locations. Samples were analyzed for Gasoline Range Organics (GRO) using AK101, Diesel Range Organics (DRO) using AK102, Residual Range Organics (RRO) using AK103, benzene, toluene, ethylbenzene and xylenes (BTEX) using Environmental Protection Agency (EPA) method 8021, and volatile organic compounds (VOC's) using EPA method 8260. Two soil samples were collected from areas that appeared unaffected by mine activities (background) and analyzed for Total Organic Carbon (TOC) using American Society for Testing and Materials (ASTM) D4129-82M. Soil samples were collected from approximately 0.5 to 2.0 feet below ground surface (bgs). Five soil samples with the highest PID field screening results were analyzed for polynuclear aromatic hydrocarbons (PAH's) using EPA method selective ion monitoring (SIM) and metals including arsenic, cadmium, chromium and lead extracted by EPA methods 6010/7000.

The following table provides a summary of the contaminants of concern found in the soil.

Contaminant	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (pmm)	Method 2, Migration to GW Cleanup (mg/kg)	Location of Maximum Concentration
DRO	20	17,000	250	Mine Camp Area E
Benzene	0.07	0.1	0.02	Mine Camp Area E

Seven surface-water samples were collected from an unnamed creek and one surface-water sample was collected from the Maclaren River. Downstream locations were sampled before upstream locations along each stream to minimize disturbing sediment that could affect downstream surface-water samples. Samples were analyzed for BTEX, Total Aromatic Hydrocarbons (TAH), Total Aqueous Hydrocarbons (TaqH), PAH's and metals. The only contaminant that exceeded water quality standards was copper. Copper exceeds the water quality standard at upgradient and downgradient sample locations along unnamed streams in the vicinity of the site and the Maclaren River. These results are representative of the area and are considered indicative of a copper mine.

The petroleum contaminated soils are most likely the result of 55-gallon barrels that may have leaked or spilled in the area. There is no other evidence of fuel uses on site, such as above or below ground storage tanks, that may have caused the contamination.

Contaminants of Concern and Concentrations

The contaminants of concern associated with this site include DRO and benzene; all other petroleum related constituents sampled for were below a Method Two, migration to groundwater, cleanup levels. The maximum concentration of DRO found in the soil was 17,000 milligrams per kilogram (mg/kg) and benzene was 0.1 mg/kg.

Some concentrations of metals were found that are above State of Alaska Regulations 18 AAC 75, Table B-2, under 40 inch zone, migration to groundwater cleanup levels. These metals represent background conditions based on the generally consistent concentrations for samples from across the site and as evidenced by mining activity on the site.

Method Three Alternative Soil Cleanup Levels

The maximum concentration of contaminants found in the soil were evaluated in accordance with cleanup levels established in 18 AAC 75.341, Methods 1 and 2. With the exception of DRO, benzene, and metals, all other soil contaminants were below the Method 2, under 40 inch, migration to groundwater cleanup levels found in Table B-2. Assuming the metals represent natural background conditions, the two contaminants of concern are DRO and benzene.

Site specific data was used under 18 AAC 75.340(e)(2) to determine the soil cleanup levels based on the potential for contaminant migration to groundwater. The following site specific values were proposed for use at this site for the purposes establishing Method Three Cleanup levels for DRO and benzene:

Organic Carbon Content of Soil (f_{oc}): The proposed value is 0.0042, based on a site specific background value.

Infiltration Rate (I): The proposed value is 0.09, based on a site specific average annual precipitation rate.

Based on the site specific values referenced above and the determination that the cleanup levels are protective of human health and the environment, alternative soil cleanup levels of 1100 mg/kg for DRO and 0.03 mg/kg for benzene are approved for this site.

Groundwater

Based on the site characterization data, the historical mining use of the area, and the evidence that most of the contamination is associated with surface staining, the Alaska Department of Environmental Conservation (ADEC) has determined that groundwater sampling will not be required at this time. Information from previous reports indicate that groundwater may be approximately 15 feet below ground surface (bgs). If the soil contamination is limited to the first

two feet bgs and the groundwater is at 15 feet bgs, then there would be more than 10 feet of clean soils above the groundwater table which is considered a safe buffer from possible contaminant migration.

As a condition of the groundwater sampling moratorium, ADEC will require confirmation of the depth to groundwater during activities associated with contaminated soil excavation. This should be done in an area that is free of contaminated soils. ADEC will review this information along with the maximum depth of soil contamination, to determine if any further cleanup action and/or groundwater monitoring is required.

Cleanup Action Plan

The alternative cleanup levels established for this site should be used to develop a cleanup action plan. The information that must be included in the cleanup plan can be found in 18 AAC 75.360, titled "Cleanup Operation Requirements." A possible cleanup action recommended in the "Site Characterization and Removal Action Report" was to excavate and remediate the soil exceeding approved cleanup levels.

Conclusions

Following the treatment of the contaminated soil, a final cleanup report must be submitted to ADEC. The information that must be included in the final report is found in 18 AAC 75.380, titled "Final Reporting Requirements and Site Closure." An institutional control, in the form of a deed notice, identifying the contaminated soil left on-site may be required.

In conclusion, ADEC has determined that alternative cleanup levels of 1100 mg/kg for DRO and 0.03 mg/kg for benzene are protective of human health and the environment. However, if site conditions should change and contaminant levels are identified at concentrations that may pose a human health or environmental risk, additional investigative and/or corrective action work may be necessary.

Approval:

The record of decision presented above is approved.

for Renee Evans, Project Manager
ADEC Contaminated Sites Remediation Program

7-11-2000
Date

Jim Frechione, Section Manager
ADEC Contaminated Sites Remediation Program

July 11, 2000
Date

THE STATE
of ALASKA
GOVERNOR BILL WALKER

Department of Natural Resources
DIVISION OF MINING, LAND & WATER
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November 20, 2015

Alaska Department of Natural Resources
Division of Mining, Land & Water
Realty Services Section
Attn: Sean O'Guinn
550 W 7th Ave, Ste 1050A
Anchorage, AK 99501

RE: Maclaren Glacier Mine Dump Site-Clean Up Complete

Mr. O'Guinn:

The Department of Natural Resources, Division of Mining, Land & Water, Southcentral Regional Office (DNR, DMLW, SCRO) has reviewed the Maclaren Glacier Mine Landspread site report from Marsh Creek dated November 21, 2013, located in Section 14 of Township 019 South, Range 006 East, Fairbanks Meridian. We understand the purpose of the report was to determine if clean up levels were met by the Bureau of Land Management (BLM) as per the Alaska Department of Environmental Conservation (ADEC) approved work plan dated August 6, 2013. The report includes:

- Background of the Maclaren Glacier Landspread site: This section discusses the creation of the landspread sites, LF-1 and LF-2, to mitigate hydrocarbon-impacted soil transported from nearby excavations associated with the prior mining activities. After the September 2000 and October 2001 activities the results for Diesel Range Organics (DRO) were above the ADEC method two clean up criteria.
- Multi-Increment (MI) Sampling procedures: This section discusses the MI sampling procedures taken according to the ADEC approved work plan.
- Sampling Results: DRO being the only contaminate of concern at both landspread sites, the results from the 2013 sampling indicated levels below the ADEC method two cleanup criteria.
- Conclusion: "Cleanup Complete" determination should be requested for this site.

In conjunction with review of the report, SCRO staff also visited the site on June 10, 2015. Upon that visit, SCRO staff verified reports of a second mine related cache site located to the south of Hidden Lake which contained miscellaneous trash and what appeared to be explosives. On August 25, 2015 SCRO staff and BLM concluded that there was TNT present at the site. The site was then mitigated by FBI EOD on August 28, 2015.

Based upon the information contained in the reports and field visits by SCRO staff, the affected lands have met ADEC requirements for closure and appeared to be restored to an acceptable condition. Thus, the Department of Natural Resources, Division of Mining, Land & Water, Southcentral Regional Office concurs with BLM that the cleanup of the Maclaren Glacier Mine site is complete.

If further information is required please contact Candice Snow at 907-269-5032 or by email at candice.snow@alaska.gov.

Sincerely,

Clark Cox, Regional Manager
Southcentral Land Office, Division of Mining, Land & Water

BLM Maclaren Glacier Mine Dump Site
ADEC File 190.38.002.
Located within Sections 11, 13, & 14, Township 19 South, Range 6 East, Fairbanks Meridian, Alaska.

Cleanup Complete Landowner Concurrence*
As the landholders of the BLM Maclaren Glacier Mine Dump Site, the Alaska Department of Natural Resources, current landholder per TA20070138, and the Bureau of Land Management, former landholder, concur that cleanup is complete, as demonstrated by the February 16, 2001 Remedial Action Report and the December 3, 2013 letter from ADEC regarding completion of landspread treatment. A failure to accept this determination by either party may result in ADEC requiring further remedial action in accordance with 18 AAC 75.380.

11/5/2015
Signature, Date
Bureau of Land Management

Lawrence J Beck, Env Protection Spec
Printed Name, Title
Bureau of Land Management

Virginia Gallus 11/24/15
Signature, Date
Alaska Department of Natural Resources

Virginia Gallus, Acting Section Chief
Realty Services
Printed Name, Title
Alaska Department of Natural Resources

***Note to Responsible Person:**
After making a copy for your records, please return a signed copy of this form to the BLM project manager within 30 days of receipt of this letter. BLM will forward on to ADEC for inclusion with the "Cleanup Complete" determination record.