KENNECOTT GREENS CREEK MINING COMPANY

GENERAL PLAN OF OPERATIONS

APPENDIX 6

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN

Revision Dates:
7 December 1994
24 July 1997
18 May 2000

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN

Engineering Certification

I hereby certify that I have reviewed this SPCC Plan, and having examined the facility and being familiar with the provisions of 40 CFR § Part 112, attest that it has been prepared in accordance with good engineering practice.

Engineer's Name: Eric Sundberg . Engineer's Seal:

Engineer's Signature: _____

Date Certified: _____

Registration Number: CE#9165 .

Registering State: Alaska .

Log Of Plan Reviews And Updates

Date	Reviewed By	Revised	Description of Review/Revisions
		No	Original Plan
7 December 1994	Bill Oelklaus	Yes	
24 July 1997	Eric Sundberg		Triennial Review
18 May 2000	Bill Oelklaus	Yes	Update format, facility information/storage areas

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1. INTRODUCTION

This Spill Prevention Control and Countermeasure (SPCC) Plan is to be used in conjunction with the Greens Creek Best Management Practices and Facility Response Plans in ensuring environmentally sound operating procedures. This plan has been prepared in accordance with the guidelines in 40 CFR § 112.7.

1.1. Basic Information

Facility Name:	Greens Creek Mine
Facility Owner:	Kennecott Greens Creek Mining Company PO Box 32199 Juneau, Alaska 99803-2199
Facility Type:	Underground Mine with Bulk Fuel Storage
Facility Location:	Admiralty Island, Alaska
Initial Operation:	February, 1989
Responsible Position:	Environmental Manager

1.2. Management Approval and Commitment

Kennecott Greens Creek Mining Company (KGCMC) management extends full approval with authority at a level to commit the necessary resources toward spill prevention. Manpower, equipment, materials and as-needed special items will be provided by the most expeditious means necessary to fully support and execute this plan.

1.2.1. The Greens Creek Mine facilities, including the fuel loading and storage facilities, have been professionally designed and constructed to minimize impacts to the environment. Engineering specifications are reviewed and accepted by appropriate regulatory agencies prior to construction.

1.2.2. There is every intention of operating the facility for zero oil spillage. All employees, contractors, support personnel, and authorized visitors are mandated to take every reasonable and prudent action possible to prevent and/or report oil spills of any kind.

1.2.3. Any observed spill (regardless of size) must be reported immediately to the Environmental Manager or his designee. A decision will then be made as to reporting requirements and implementation level of the contingency plan.

1.3. Facility Location / Proximity To Navigable Waters

The facility is located approximately 18 miles southwest of Juneau, Alaska on the northwest side of Admiralty Island (See Figure 1 in Appendix B). The area includes the Greens Creek valley and the smaller drainage basins of Zinc Creek, Tributary Creek and Cannery Creek. These creeks flow into the marine waters of Hawk Inlet located on the northwest shore of the Island. Admiralty National Monument comprises the majority of Admiralty Island, and is administered by the U.S. Forest Service, Tongass National Forest, Chatham Area. The Alaska National Interest Lands Conservation Act of 1980 (ANILCA), designated most of the monument as wilderness. The majority of the Greens Creek Mine facility's approximately 320 acres, lie within Admiralty National Monument, all within the non-wilderness portion.

2. FACILITY DESCRIPTION

The Greens Creek Mine is a precious and base metals (silver, gold, zinc and lead) underground mine with a production rate of a nominal 1,300 to 2,000 tons-per-day that directly employs approximately 260 persons. KGCMC personnel man and operate the facility 24 hours per day, 7 days per week, 365 days per year. Major components of the facility include the mine/mill site, tailings site, Hawk Inlet site, Young Bay site, and the road system. All electricity for the entire facility is generated on site through diesel fueled generators. All vehicles and equipment are diesel powered (with few exceptions) and most buildings are heated with diesel fuel, used oil, or direct heat recovery. All petroleum storage tanks at the Greens Creek Mine facility are above ground. No underground tanks are used or known at this facility.

2.1. Mine/Mill Site

Located at an elevation of 920 feet, 8.5 miles from the marine terminal at Hawk Inlet, this site is adjacent to Greens Creek and includes the mine, mill, power house, service complex, offices, warehouse, and a 60,000 gallon bulk storage tank for diesel fuel (see Figure 2 in Appendix B). Fuel is delivered by a 10,000 gallon tanker truck from the bulk tank located at Hawk Inlet. An average of eight-to-ten fuel loads per week is necessary to support operations at full capacity. Approximately 4,000 gallons per month of lubricating oils are also transferred by truck from Hawk Inlet to the mine/mill site in portable tanks.

2.2. Tailings Site

Located at the upper reaches of Tributary Creek drainage, this site includes a dry stacked tailings impoundment, a 0.5 acre retention/surge pond, a 1.1 million gallon holding tank for waste water storage prior to treatment, and a wastewater treatment plant (see Figure 3 in Appendix B). All mine/mill wastewater, and surface water runoff from the mine/mill, tailings, and Hawk Inlet sites are collected at the Tailings Site, treated, and discharged into Hawk Inlet in accordance with the Greens Creek National Pollutant Discharge Elimination System (NPDES) permit Number AK-004320-6.

2.3. Hawk Inlet Site

This site includes the marine terminal where all supplies, materials, fuels, and ore concentrates are loaded and/or unloaded on a routine basis (See Figure 4 in Appendix B). Also included are a 200,000 gallon and a 10,000 gallon bulk diesel fuel storage tanks, associated fill piping from the fuel barge unloading dock, a fuel loading facility for vehicles and the tanker truck, an electrical

generator building, and warehouse. Less than 2,000 gallons of gasoline are stored at the fuel loading facility. Assorted lubricating oils in portable tanks, totes, and drums are temporarily stored at this site's warehouse prior to their transport to the mine/mill site. A large ore concentrate storage building, temporary housing facilities, and ancillary support facilities are also located at the Hawk Inlet site.

2.4. Young Bay Site

This site includes a docking facility for the boat, which transports personnel to and from the island twice per day and a parking area for the buses used to transport personnel to and from the Hawk Inlet and mine/mill sites. A diesel powered electrical generator building provides electricity for the site (see Figure 5 in Appendix B).

2.5. Road System

Roads have been constructed for the Greens Creek Mine between the Young Bay site, the Hawk Inlet site, and the mine/mill site. A 5 mile long, 14 foot wide road allows transport of personnel from the Young Bay dock to Hawk Inlet. An 8.5 mile long, 16 foot wide road allows transport of personnel, supplies, and ore concentrate between Hawk Inlet and the mine/mill site, as well as dry tailings from the mine/mill site to the tailings area (see Figure 1 in Appendix B).

2.6. Oil Storage Locations

Table 1 in Appendix A lists each oil storage location at the sites identified above for containers of 55 gallons or more. Numeric IDs have been assigned to each. These can be cross-referenced to the appropriate figure for each of the above referenced sites in Appendix B.

2.7. Other Chemical Storage Locations

Although not required by 40 CFR § 112 to be included in an SPCC Plan, Table 2 in Appendix A lists storage locations of other chemicals at the sites identified above for containers of 55 gallons or more. Alpha IDs have been assigned to each. These can be cross-referenced to the appropriate figure for each of the above referenced sites in Appendix B.

3. SPILL EVENT HISTORY

A summary of oil spill events including a description of the spill and corrective actions taken are shown in the table below. Methods for preventing recurrence are indicated by the corrective actions as well as utilizing any releases occurring at KGCMC and situations from similar facilities, as examples for the SPCC Plan training.

(Note for revisions: Spill event means discharge into/onto navigable waters)

Date	Location	Quantity	Cause	Corrective Action Taken
04/01/89	Hawk Inlet	3,000 gal.	faulty solenoid valve	no automatic fill of generator day tank, only manual fill.
10/24/90	Hawk Inlet	<1 gal.	faulty D-ring	Water skimmed and material collected
11/26/90	Mine Site	1 gal.	truck struck power pole	material picked up and disposed
01/03/91	Mine Site	60 gal.	fork lift punched drum in snow	oil was cleaned up and disposed
09/11/91	Hawk Inlet	<1 gal.	line leak	fittings were replaced
01/21/92	Hawk Inlet	60 gal.	bad seal	seal replaced on shiploader hydraulic system
09/28/92	Mine Site	8 gal.	overfill	changed transfer procedures
09/30/92	Hawk Inlet	40 gal.	line failure	hydraulic line replaced
10/27/92	Hawk Inlet	1 gal.	line leak	hydraulic line replaced
10/30/92	"B" Road	20 gal.	line failure	hydraulic line replaced
02/24/94	Hawk Inlet	7 gal.	line failure	hydraulic line replaced
03/14/94	Hawk Inlet	50 gal.	tank movement	scheduled to build concrete base to prevent shifting

4. POTENTIAL OIL SPILL PREDICTIONS

Based on the engineering design, site drainage containment features, equipment reliability, trained personnel and adherence to prescribed operating and maintenance procedures, the possibility of a major oil spill event at the Greens Creek Mine is very remote. From a contingency preparedness standpoint, the potential does exist for accident, equipment failure, and/or operator error.

4.1. Oil Storage Tanks

The most likely potential causes of a spill from the tanks listed in Table 1 (Appendix A) would be from overfilling, leakage, or rupture. The available containment mechanisms for each tank are listed in the table. In a hypothetical worst-case scenario the maximum possible flow rates are assumed to be the tank's total capacity in gallons per hour, and the total quantity which could be discharged is assumed to be the tank's total capacity. The direction of oil flow in the event of a major spill event from these tanks can be predicted from the contour lines shown on the appropriate figure for each tank (Figures 2, 3, 4, and 5 in Appendix B). The bulk storage tanks pose the most serious threat of oil in the event of a major release. However, these tanks are diked to contain a minimum of 110% of the volume of the largest tank, and all runoff from these sites is diverted to a collection system.

4.2. Fuel Barge Unloading

The greatest potential for oil spills reaching navigable waters comes during fuel barge unloading into the bulk tank at Hawk Inlet. The marine terminal bulk tank is filled through a 4 inch diameter, 870 feet long, steel pipeline originating at the marine headers at dockside. Operator error could result in a poorly made hose connection, improper valve or pressure setting, and/or overfilling. In a hypothetical worst-case scenario of the line rupturing and going undetected, the rate of flow could potentially be the maximum pumping rate of 30,000 gallons per hour, and the total quantity released could potentially be the total volume of the tank or 200,000 gallons. The direction of oil flow in the event of a spill event can be predicted from the contour lines shown on Figure 4 in Appendix B. This operation is closely monitored by trained personnel and occurs approximately once every ten days.

4.3. Fuel Tanker Truck Loading/Unloading

Diesel fuel is supplied to the mine/mill site via a 10,000-gallon tanker truck. A tanker truck loading station, connected to the bulk storage tank at Hawk Inlet, is used to fill the tanker truck, and it is emptied at an unloading station connected to the bulk storage tank at the mine/mill site. These facilities are used approximately eight times per week and are perhaps the most susceptible part of the facility to human error. Overfilling and sloppy hose handling would be the most likely cause of a spill from this operation. In a hypothetical worst-case scenario of the line rupturing and going undetected, the rate of flow could potentially be the maximum pumping rate of 10,000 gallons per hour at the Hawk Inlet facility or 20,000 gallons per hour at the mine/mill facility. The maximum quantity released could potentially be the total volume of the 200,000 gallon tank at the Hawk Inlet facility or the 10,000 gallon tanker truck being unloaded at the mine/mill facility. The direction of oil flow in the event of a spill event can be predicted from the contour lines shown on Figures 2 and 4 in Appendix B. Both the loading and the unloading stations are located where spills would be controlled/contained. The Hawk Inlet station is curbed and spills would be diverted to the secondary containment structure of the bulk storage tank, or collected in the site's runoff collection system. The mine/mill station is located where spills would be diverted to the site's runoff collection system.

5. PREVENTION MEASURES

Greens Creek utilizes diapered tanks (double-walled), dikes, berms, curbs, non-porous surfacing, diversion ditches and retention ponds, drip pans, drainage and collection systems, as well as isolation and absorbent materials to effect spillage control (Tables 1, 2, and 3 See Appendix A). Through these, tertiary containment features further guard most storage areas. Drainage from diked containment areas is controlled by manually operated valves on gravity flow discharge lines to retention ponds.

5.1. Containment and/or Diversionary Measures

The primary objective of any and all containment and diversionary measures is to prevent oil spills from entering navigable waters or other sensitive areas and/or creating a hazardous or dangerous environment. Table 1 identifies the secondary containment for each facility component that may be a potential source of an oil spill.

Drainage of all “contact” waters from the Hawk Inlet, Tailings, and 920 Areas is directed by piping into a 1,100,000 gallon tank in the Tailings Area. These waters are all directed through the Greens Creek final water treatment plants prior to confirmation monitoring and discharge to the Hawk Inlet marine environment under the Greens Creek NPDES Permit.

Absorbent material and impoundment booms are located strategically about the facility for responding to emergencies. The contingency van at Hawk Inlet includes such things as floating containment boom, 100-foot sweeps, rolls of absorbent pillows, bales of absorbent pads, and absorbent booms. Smaller covered response containers are located at both the Hawk Inlet and 920 vehicle refueling locations, both the Hawk Inlet and 920 Warehouses, and at mile 4.6 of the B-Road (approximately ½ way along the road between the 920 and Hawk Inlet sites. Additional spill response materials are also kept in the generator buildings, the surface and underground shops, and the Mill Building.

KGCMC maintains an active membership in the Southeast Alaska Petroleum Resource Organization (SEAPRO). This membership makes available substantial quantities and types of response equipment and personnel in the event of a petroleum spill as well as training and support.

It was considered impractical to provide secondary containment for the piping of the fuel storage and supply system. Because buried pipe is difficult to inspect, these lines were positioned above ground. All lines are properly anchored and portions passing through containment berms are wrapped to protect against corrosion. The Hawk Inlet fuel off-load line is pressure tested and certified annually.

Inspections are conducted regularly, as well as during all fuel-loading operations. All inspection and testing records are maintained as active environmental files for a period of one year. Inactive inspection files are archived for a period of two years then disposed.

5.2. Localized Secondary Containment

The following areas at the Greens Creek facilities employ Localized Secondary Containment:

- 920-Shop has a non-porous concrete floor. Drains direct potential flow into a lined ditch, which feeds into a concrete settling pond, and on into a lined retention pond.

- 920-Powerhouse has a non-porous concrete floor. Tankage is situated within curbed areas. Potential overflow is routed into the floor drain system which conveys flows into a lined ditch, which feeds into a concrete settling pond, and on into a lined retention pond.

- The external 920 area around the Mill/Shop/Office complex has been sealed with a non-porous, concrete surfacing. All drainage from this area is directed by curbing and drainage system into a lined ditch, which feeds into a concrete settling pond, and on into a lined retention pond.

- The Hawk Inlet truck fill-station and wheel-wash area has been sealed with a non-porous, concrete surfacing. All drainage from this area is directed by curbing and drainage system into a concrete-lined retention pond.

5.3. Conformance With Regulatory Requirements

A contingency plan that complies with the provisions of 40 CFR, Part 109 has been completed for the facility. The Contingency Plan was developed with the Best Management Practices under the requirements of the Greens Creek NPDES permit. In addition, KGCMC has developed an Oil Facility Response Plan to comply with the provisions of the Oil Pollution Act of 1990. It is available in the KGCMC Environmental office. The Certification Of The Applicability Of The Substantial Harm Criteria Checklist can be found in Appendix C.

6. CONFORMANCE WITH 40 CFR § Part 112.7(e)

The following subsections of this SPCC plan contain complete discussions as to this facility's conformance with Title 40 CFR § Part 112.7(e). As required, the discussions are sequentially arranged. The following sections of Part 112.7(e) apply to the Greens Creek facility:

1. Facility Drainage
2. Bulk Storage Tanks
3. Facility Transfer Operations
4. Facility Tank Truck Loading/Unloading
8. Inspections and Records
9. Security
10. Personnel, Training and Spill Prevention Procedures

* Sections 5, 6 and 7 of 40 CFM § Part 112/7(e) do not apply to KGCMC.

6.1. Facility Drainage

A single 6-inch diameter valved drainpipe controls outflow from each of the bulk storage containment structures. Each pipe runs beneath the containment berm with its manually-operated gate valve on the outside of the dike. The valve remains closed and locked except during periods of water discharge. No flapper valves of any type are used in the diked areas.

Inspections of the containment area are conducted at least one time per week with greater frequency during periods of high precipitation. Because the drainage from the bulk storage areas is not directed to an oily water treatment system, the impounded storm water will be visually inspected and monitored closely for signs of contamination. Inspections and discharges of storm water will be cleaned up immediately prior to discharge.

After removal of any visible contamination, water that collects in these tank containment areas will be emptied either by opening the manual gate valve, or by pumping. This impounded water will then be treated in the retention pond system. Because of the high precipitation in the area, a series of drainage ditches, culverts and retention ponds have been designed to intercept and treat all of these site's runoff. The runoff control systems at the mine service area and at the Hawk Inlet Marine Terminal also provide an additional, tertiary form of containment for the bulk fuel tanks.

The haulage road is generally crowned to direct road runoff into an inside drainage ditch. This system would provide secondary containment for any spills that might occur in the actual roadway such as from the tanker truck. This drainage terminates in a series of culverts that contain straw bales or sediment curtains to help treat runoff water prior to its direct release to the surrounding environment.

6.2. Bulk Storage Tanks

The bulk storage tanks used at the Greens Creek Mine are steel tanks constructed of welded steel in accordance with API 650 standards. All materials used are compatible with the stored petroleum products. The storage areas are constructed so drainage is away from the tanks' bottom to minimize corrosion from ponding water.

As was discussed earlier, the bulk tanks are located in containment areas diked or impounded on all sides. The secondary containment is capable of holding 110% of the largest tank volume plus additional freeboard for precipitation. The dikes are constructed on solid rock and are comprised of crushed gravels. Each containment area (dikes, berms, floor) were then lined with High-Density Polyethylene in 1995.

Because of wet soil conditions underlying the 920 mine service storage facility, a sub-base was installed complete with 4-inch perforated drain lines to dewater the foundation. The sub-base is isolated from the actual floor of the containment area by a layer of filter fabric, gravel and an impermeable layer of compacted clayey material. The subdrain flows to a catchment basin prior to discharge. Due to the impermeable HDPE liner layers above it, this subdrain flow is in no danger of collecting spilled oil.

Each of the two containment areas (920 and Hawk Inlet) contain a single 6-inch diameter drain pipe with manually operated gate valve. The drain from the 920 mine service area containment basin flows into a lined ditch that leads to a lined retention pond system prior to transfer to the NPDES treatment facility. The Hawk Inlet containment area drain pipe is also controlled by a manually operated gate valve, which drains to a collection ditch that terminates in a small concrete retention pond. All drain gate valves are kept closed and locked and all impounded runoff water is thoroughly inspected prior to release. Compliance with applicable water quality standards will be ensured to not cause a harmful discharge as per 40 CFR § Part 100.

All bulk storage tanks at this facility are located above ground and none contain heating coils. Potential for flooding and washouts were considered prior to placement of these tanks such that they will not be subjected to unnecessary environmental hazards. The tanks and foundations, as well as the dike systems are inspected visually at least once per week. In addition, the bulk tanks are in plain view of the facility's employees which help in observing for deterioration, leaks, or accumulated oil/water inside the diked areas. Only the 200,000 and 60,000 gallon tanks are fail-safe engineered. Single-walled day tanks are being removed in a systematic manner, replaced by double-walled tanks. All new day tanks are double-walled. The transfer of fuel to the 60,000-gallon tank is via 10,000-gallon tank truck. Smaller tanks around the Greens Creek facilities are filled using the 3,500 gallon fuel truck, or the 200-gallon lube truck. Tank truck operators know the volume of fuel on the truck, and will fill and gauge small tanks manually. Therefore, by exercising extreme caution the chances of an overfill are small.

For the large tanks, a "VAREC" automatic fuel level indicator gauge is used during the filling of the tanks. Signals between the fuel “tankerman” and the tank “gauger” are through voice, hand signals and two-way radio.

There are no plant effluents discharged directly into navigable waters. All effluents are directed to retention ponds where all discharges are monitored and inspected for signs of oil or system upsets. As noted earlier, all waters are directed through the Tailings Area water treatment plants prior to monitoring and discharge under the Greens Creek NPDES permit.

It is standard practice at this facility to fix or replace any leaking equipment, seals/gaskets, and/or seams that are large enough to cause an accumulation of oil in the diked area. Any mobile or portable oil storage system (i.e., tanker truck, fuel truck, lube oil truck, etc.) in service will be positioned where they cannot spill into navigable waters.

6.3. Facility Transfer Operations

The majority of all piping for facility transfer operations is located above ground. Buried piping is present in small sections primarily where supply lines pass through containment dikes or run under supply pumps. All underground lines are coated and wrapped (AWW C203 "coal tar enamel coating or equivalent."). If at any time a portion of below grade pipe is exposed it will be inspected for corrosion and corrected if needed.

All fuel pipelines remain in service on a continual basis. The offloading supply line from the dock to the 200,000-gallon tank is used the least of all lines. This line is used approximately every 10 days for filling the bulk tank. Following each fuel transfer, this line is back-drained prior to its disconnection from the fuel barge. The line is then capped until its next use. A drip pan remains positioned beneath this connection point at all times during preparation and use. All pipe supports have been designed to allow for expansion and contraction of the line. Above ground portions of the pipe are inspected regularly. During these inspections, the overall condition of the expansion joints, valve glands and bodies, drip pans, pipeline supports and any other metal surfaces is assessed. In addition hydrostatic testing to 150% pressure is conducted once per year in those areas where drainage is such that pipe failure might lead to a spill event. Any pipeline not in service or in standby for an extended period of time will be capped and labeled as to its origin.

Most above ground pipelines are situated away from all areas where vehicles are used on a regular basis. For locations such as the fuel truck loading facility and in areas where feeder lines supply generators etc., 4-inch steel posts filled with concrete extends 4 feet above grade to provide pipe protection from physical damage. All personnel are well aware of the dangers to exposed pipelines.

Signs have been placed in areas that are not regularly used to remind personnel of potential dangers.

6.4. Facility Tank Truck Loading/Unloading Facility

Tank truck loading/unloading operations are conducted in accordance with Greens Creek standard operating procedures. The procedures followed meet the requirements and regulations established by the Department of Transportation. The tank truck driver is trained in these operations and is responsible for oil spill prevention.

The two truck loading/unloading facilities at the Greens Creek Mine (at the 920 and Hawk Inlet areas) are fully protected by concrete slab bases which are drained to impermeable secondary containment structures both capable of holding well in access of a full truck load of 10,000 gallons.

There are no interlocked warning lights or physical barriers located at the loading/unloading area to prevent vehicle departure before a complete disconnect of fill lines. Signs, however, are present in conspicuous locations reminding drivers to check all lines, fill spouts, and valves prior to departing. The tank truck drivers ensure that both prior to and following truck filling and departure, all vehicle outlets, including the lowermost drain, are examined closely for signs of leakage. Any adjustments, repairs, or replacements will be performed as required to prevent oil leakage during transport.

*** Sections 5, 6 and 7 of 40 CFM § Part 112/7(e) do not apply to KGCMC**.

6.5. Inspections and Records

Inspections required by Title 40 CFR § Part 112 are accomplished in accordance with the procedures established by KGCMC. Visual inspections of the bulk tanks, pipelines and containment area are conducted once per week and recorded on inspection log forms. All forms will be signed by the inspector and will be kept on-site for a period of three (3) years.

These logs and the written inspection procedures are not included in this SPCC plan, however, examples of the inspection checklist can be seen in Appendix D.

6.6. Security

Because of the remote nature of the Greens Creek facility it is primarily only Company personnel that are in a position to access the storage facility. All personnel are aware of the need to minimize environmental impacts and the consequences of a major oil spill. Therefore, no fencing is provided for the bulk storage areas.

All flow valves and/or drains on tanks and pipelines are kept locked at all times of non-use. Controls to oil pumps, such as at the off-loading facilities will also be locked during periods of non-operation or non-standby status.

As was discussed earlier in the plan, all pipelines not in service or on extended standby that are either full or empty will be drained, capped and marked as to their status and origin.

Operation of the facility continues 24 hours per day. For this reason lighting systems have been installed in all critical areas to allow early discovery of spills or leaks and to allow sufficient visibility during darkness for security checks as well as ongoing operations.

6.7. Personnel, Training, and Spill Prevention

KGCMC personnel are trained in the operation and maintenance of equipment to prevent the discharge of oil. Employees are also made aware of applicable pollution control laws, rules and regulations. The operator in charge of overseeing all bulk tank loading operations has received 48 hours of training in oil transfer operations. Additional periodic training programs are conducted for all employees involved in oil transfer operations.

Included in the periodic training sessions will be briefings that highlight and describe past spill events or failures, malfunctioning equipment or newly developed precautionary measures.

The Greens Creek facility Environmental Manager, is the designated person-in-charge accountable for oil spill prevention.

KENNECOTT GREENS CREEK MINING COMPANY

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN

APPENDIX A

TABLES

Table 1 - Oil Storage Locations

ID	Location	Type	Capacity	Stored Material	Containment / Diversion
Mine/Mill Site - Figure 2					
1	Bulk Storage Area	steel tank	60,000 gal	diesel fuel	dike w/syn liner, site runoff collection sys
2	920 Shop	diapered steel tank	5,000 gal	hydraulic oil	curb, site runoff collection sys
3	920 Shop	diapered steel tank	5,000 gal	15/40w motor oil	curb, site runoff collection sys
4	920 Shop	diapered steel tank (portable)	1,000 gal	used oil	curb, site runoff collection sys
5	920 Shop	steel/plastic tote (portable)	350 gal	50w gear oil	curb, site runoff collection sys
6	920 Shop	steel/plastic tote (portable)	350 gal	80/90w gear oil	curb, site runoff collection sys
7	Power House	diapered steel tank	5,000 gal	30w motor oil	curb, site runoff collection sys
8	Power House	steel/plastic tote (portable)	350 gal	15/40w motor oil	site runoff collection sys
9	Power House	steel/plastic tote (portable)	350 gal	15/40w motor oil	site runoff collection sys
10	Power House	diapered steel tank	500 gal	used oil	curb, site runoff collection sys
11	Power House	diapered steel tank (portable)	1,000 gal	used oil	curb, site runoff collection sys
12	Power House	steel tank	570 gal	diesel fuel	in bldg, curb, site runoff collection sys
13	Power House	steel tank	570 gal	diesel fuel	in bldg, curb, site runoff collection sys
14	Administration Bldg	diapered steel tank	500 gal	diesel fuel	site runoff collection sys
15	Batch Plant	diapered steel tank	500 gal	diesel fuel	site runoff collection sys
16	Ore Pad Grizzly	diapered steel tank	500 gal	diesel fuel	site runoff collection sys
17	920 Warehouse	diapered steel tank	500 gal	diesel fuel	site runoff collection sys
18	Wet Lab Bldg	diapered steel tank	2,000 gal	diesel fuel	drainage to retention pond
19	Safety Bldg	diapered steel tank	500 gal	diesel fuel	drainage to retention pond
20	860 Heli-pad	steel tank (portable)	2,000 gal	diesel fuel	berm, site runoff collection sys
21		transformer		mineral oil	curb, site runoff collection sys
22	Used Petrol Conex	drum storage	0-30 drums	used oil & grease	site runoff collection sys
23	920 Warehouse	drum storage	0-30 drums	oils & grease	site runoff collection sys
Tailings Site - Figure 3					
1	Pit 5 WWTP	diapered steel tank	500 gal	diesel fuel	site runoff collection sys
2	Truck/Wheel Wash		gal	diesel fuel	
Hawk Inlet Site - Figure 4					
1	Bulk Storage Area	steel tank	200,000 gal	diesel fuel	dike w/syn liner, site runoff collection sys
2	Bulk Storage Area	steel tank	10,000 gal	diesel fuel	dike w/syn liner, site runoff collection sys
3	Truck Fill Station	diapered steel tank	1,000 gal	diesel fuel	site runoff collection sys
4	Truck Fill Station	diapered steel tank	2,000 gal	gasoline	site runoff collection sys
5	Truck/Wheel Wash	diapered steel tank	500 gal	diesel fuel	curb, site runoff collection sys
6	Boiler Bldg	diapered steel tank	5,000 gal	diesel fuel	
7	Core Shed	diapered steel tank	500 gal	diesel fuel	
8	Water Bldg	diapered steel tank	500 gal	diesel fuel	
9	H.I. Shop	steel tank (portable)	2,600 gal	used oil	
10	H.I. Shop	steel tank (portable)	2,600 gal	used oil	
11	H.I. Shop	steel tank	225 gal	used oil	in bldg
12	H.I. Warehouse	double-wall steel tank	10,000 gal	used oil	
13	H.I. Warehouse	diapered steel tank (portable)	1,000 gal	used oil	
14	H.I. Warehouse	diapered steel tank (portable)	1,000 gal	used oil	
15	H.I. Warehouse	steel tank (portable generator)	250 gal	diesel fuel	
16	H.I. Helipad	steel tank (portable)	2,000 gal	diesel fuel	
17	Boiler Bldg	transformer		mineral oil	curb
18	Water Bldg	transformer		mineral oil	curb
Young Bay Site - Figure 5					
1	Generator Bldg	diapered steel tank	275 gal	diesel fuel	in bldg, curb
Road System - Figure 1					
NA	Tanker Truck	steel tank	10,000 gal	diesel fuel	
NA	Fuel Truck	steel tank	3,500 gal	diesel fuel	
NA	Lube Truck	steel tank	200 gal	lube oil	
NA	Portable Tanks	(see above)	(see above)	(see above)	(see above)

Table 2 - Chemical Storage Locations

ID	Location	Type	Capacity	Stored Material	Containment / Diversion
Mine/Mill Site - Figure 2					
A	In Mill Building	Cyanide Mix Tank	2,200 gal	sodium cyanide	in bldg, curb, site runoff collection sys
B	In Mill Building	Cyanide Storage Tank	3,500 gal	sodium cyanide	in bldg, curb, site runoff collection sys
C	In Mill Building	Zinc Sulfate Mix Tank	2,200 gal	zinc sulfate	in bldg, curb, site runoff collection sys
D	In Mill Building	Zinc Sulfate Storage Tank	3,500 gal	zinc sulfate	in bldg, curb, site runoff collection sys
E	In Mill Building	Xanthate Mix Tank	2,200 gal	xanthate	in bldg, curb, site runoff collection sys
F	In Mill Building	Xanthate Storage Tank	3,500 gal	xanthate	in bldg, curb, site runoff collection sys
G	In Mill Building	Copper Sulfate Mix Tank	2,200 gal	copper sulfate	in bldg, curb, site runoff collection sys
H	In Mill Building	Copper Sulfate Storage Tank	3,500 gal	copper sulfate	in bldg, curb, site runoff collection sys
I	In Mill Building	Copper Sulfate Storage Tank	3,000 gal	copper sulfate	in bldg, curb, site runoff collection sys
J	In Mill Building	Flocculent Mix Tank	800 gal	flocculent	in bldg, curb, site runoff collection sys
K	In Mill Building	Flocculent Storage Tank	2,200 gal	flocculent	in bldg, curb, site runoff collection sys
L	In Mill Building	Aerophine Storage Tank	220 gal	flocculent	in bldg, curb, site runoff collection sys
M	In Mill Building	Slaked Lime Storage Tank	5,000 gal	slaked lime	in bldg, curb, site runoff collection sys
N	Outside Mill Building	Dry Lime Silo	50 tons	lime	site runoff collection sys
O	Outside Mill Building	Lime Slaker Mix Tank	800 gal	slaked lime	site runoff collection sys
P	Outside Mill Building	Sulfuric Acid Storage Tank	5,200 gal	sulfuric acid	dike
Q	Outside Mill Building	Ferric Chloride Storage Tank	8,400 gal	ferric chloride	dike
R	In WWTP Building	Ferric Chloride Storage Tank	2,500 gal	ferric chloride	in bldg, curb, site runoff collection sys
S		Propane Storage Tank		propane	
T	Used Chem Connex	Drum Storage	0-30 drums	surplus products	curb, site runoff collection sys
Tailings Site - Figure 3					
A	Wet Well 1 Building	steel/plastic tote (portable)	350 gal	caustic potash	
B	Pit 5 WWTP	Ferric Chloride Storage Tank	3,750 gal	ferric chloride	
C	Pit 5 WWTP	Lime Slaker Mix Tank	750	slaked lime	
D	Pit 5 WWTP	Dry Lime Silo	50 tons	lime	
Hawk Inlet Site - Figure 4					
A	H.I. Warehouse				
B	H.I. Warehouse				
C	H.I. Warehouse				
D	H.I. Warehouse				
E					
Young Bay Site - Figure 5					
NA	None				
Road System - Figure 1					
NA	Portable Tanks	(see above)	(see above)	(see above)	(see above)

Table 3 – Spill Cleanup Inventory

Item	Quantity On Hand
Skiff (14' & 16')	2
Containment Boom	1000 feet
Life Vests	10
Mustang Suits	3
Anchors	2
Rope	500 Feet
Absorbent Boom	40 Packs @ 40 per
Absorbent Sweeps	35 Packs @ 100 per
Absorbent Pads	35 Bales
Absorbent Rolls	55 Rolls
Absorbent Pillows	25 Packs
Absorbent Socks	5 Boxes
Absorbent Clay (Floor Dry)	25 Bags

Table 4 – Oil-Filled Transformer Inventory

ID	Location	Type	Capacity	Containment / Diversion
EM01	Mill CV01	Electromagnet - Active	53	in bldg, curb, site runoff collection sys
EM02	Mill CV01	Electromagnet – Stand-by	53	in bldg, curb, site runoff collection sys
TO01	A – Pond	500 kVA Transformer	150	dike, site runoff collection sys
TO02	920 Pump House	50 kVA Transformer	<50	in bldg, curb
TO03	920 Pump House	50 kVA Transformer	<50	in bldg, curb
TO04	920 Pump House	50 kVA Transformer	<50	in bldg, curb
TO05	920 Warehouse	50 kVA Transformer	<50	
TO06	860 Assay Lab	500 kVA Transformer	198	dike
TO07	Site 23 Pump Stn	500 kVA Transformer	198	dike
TO08	Mine Portal	150 kVA Transformer	>100	In bldg, curb
TO09	Tailings Water Plant	500 kVA Transformer	213	dike
TO10	Unused Number			
TO11	Tailings Truck Wash	500 kVA Transformer	213	in bldg, curb
TO12	H.I. Water Utilities	500 kVA Transformer	193	in bldg, curb
TO13	H.I. Boiler Bldg.	500 kVA Transformer	184	dike
TO--	H.I. Warehouse	167 kVA Transformer-Surplus	52	in bldg, curb
TO--	H.I. Warehouse	167 kVA Transformer-Surplus	52	in bldg, curb
TO--	H.I. Warehouse	167 kVA Transformer-Surplus	52	in bldg, curb

KENNECOTT GREENS CREEK MINING COMPANY

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN

APPENDIX B

FIGURES

Hawk Inlet

Young Bay

MONUMENT WILDERNESS BOUNDARY

NATIONAL COMMUNICATIONS TOWER

GREEN'S CK.

ZINC CREEK

TRIBUTARY CREEK

TAILINGS SITE

HAWK INLET SITE

SEE FIGURE 4

SEE FIGURE 3

CANNERY CREEK

'B' ROAD

'A' ROAD

PIT No 7

PIT No 174

PRODUCTION ROCK SITE "E"

PIT No 6

FISH PASS AND BRIDGE

FOWLER CK.

CABIN

CABINS

SEE FIGURE 5

Young Bay Site

'B' ROAD

GREEN'S CREEK

PIT No 405

Mine/Mill Site

1350 PORTAL

SEE FIGURE 2

NATIONAL MONUMENT

500

1000

1500

2000

2500

3000

LEGEND

EVACUATION ROUTE

KENNECOTT GREENS CREEK MINE

ADMIRALTY ISLAND, ALASKA

SITE LOCATION/
EVACUATION PLAN MAP

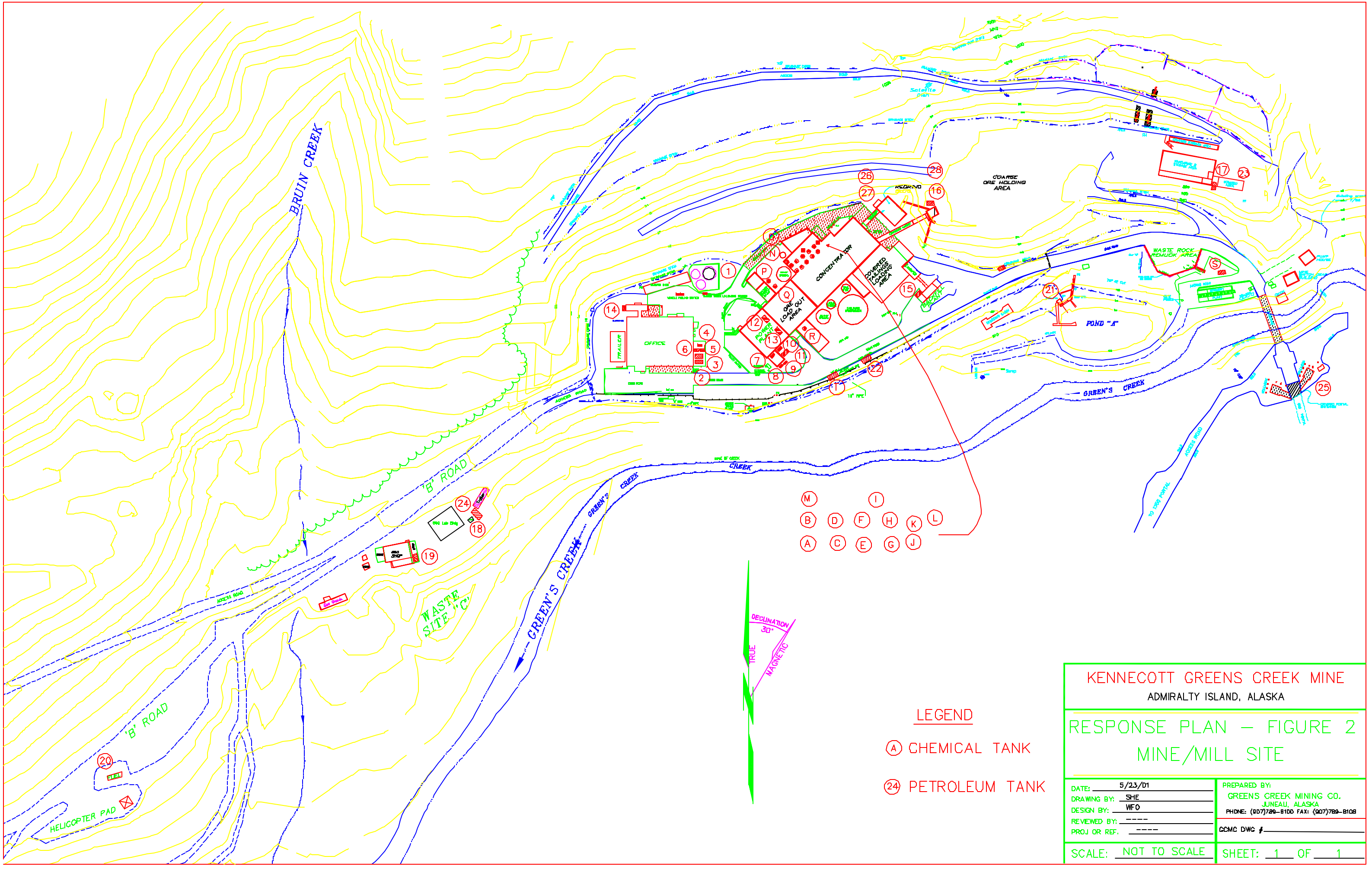
DATE: 5/23/01
DRAWING BY: SHE
DESIGN BY: ----
REVIEWED BY: ----
PROJ OR REF. ----

PREPARED BY:
GREENS CREEK MINING CO.
JUNEAU, ALASKA
PHONE: (907)789-8100 FAX: (907)789-8108

GCMC DWG #

SCALE: NOT TO SCALE

SHEET: 1 OF 6



KENNECOTT GREENS CREEK MINE

ADMIRALTY ISLAND, ALASKA

RESPONSE PLAN – FIGURE 2
MINE/MILL SITE

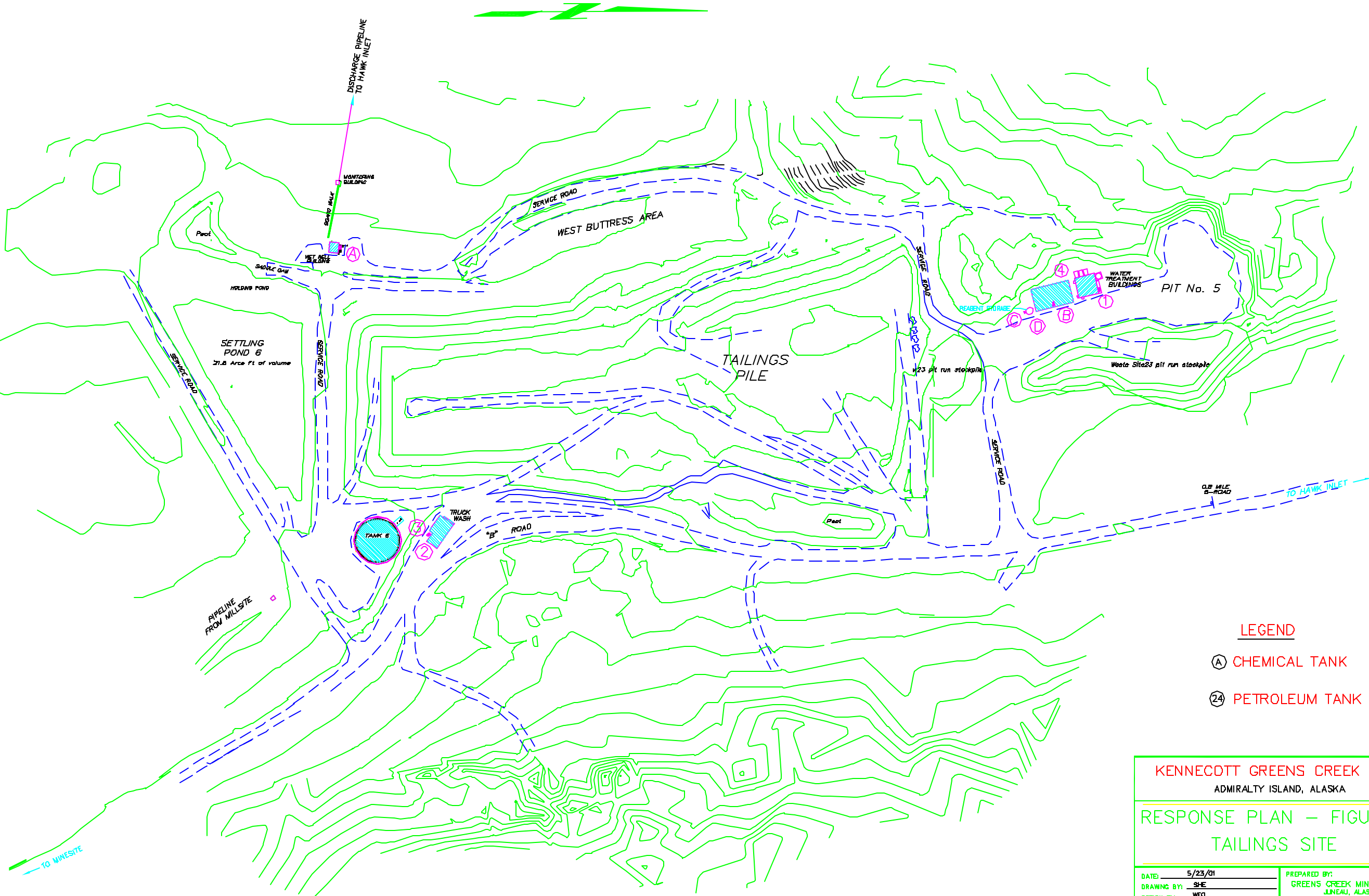
DATE: 5/23/01
DRAWING BY: SHE
DESIGN BY: WFO
REVIEWED BY: ----
PROJ OR REF. ----

PREPARED BY:
GREENS CREEK MINING CO.
JUNEAU, ALASKA
PHONE: (907)789-8100 FAX: (907)789-8108

GCMC DWG #

SCALE: NOT TO SCALE

SHEET: 1 OF 1



LEGEND

(A) CHEMICAL TANK

(24) PETROLEUM TANK

KENNECOTT GREENS CREEK MINE

ADMIRALTY ISLAND, ALASKA

RESPONSE PLAN – FIGURE 3
TAILINGS SITE

DATE: 5/23/01	PREPARED BY: GREENS CREEK MINING CO. JUNEAU, ALASKA PHONE: (907)789-9100 FAX: (907)789-9109
DRAWING BY: SHE	
DESIGN BY: WFC	
REVIEWED BY: ----	
PROJ OR REF.: ----	CCMC DWG #:
SCALE: NOT TO SCALE	SHEET: 1 OF 1

TONGASS NATIONAL FOREST

HAWK INLET

TIDELINE AT 0' ELEVATION

TIDELANDS

CANNERY CREEK

TONGASS NATIONAL FOREST

11' FLOATING BOOM

4" FUEL PIPELINE

CONCENTRATE STORAGE BUILDING

STAGING AREA

BOULDER BARRICADE

SERVICE ROAD

EQUIPMENT YARD

YARD

TEMP STORAGE AREA

H20 TANKS

TEMP STAGING AREA

TEMP STAGING YARD

WAREHOUSE

Building movement monitoring

LEGEND

(A) CHEMICAL TANK

(24) PETROLEUM TANK

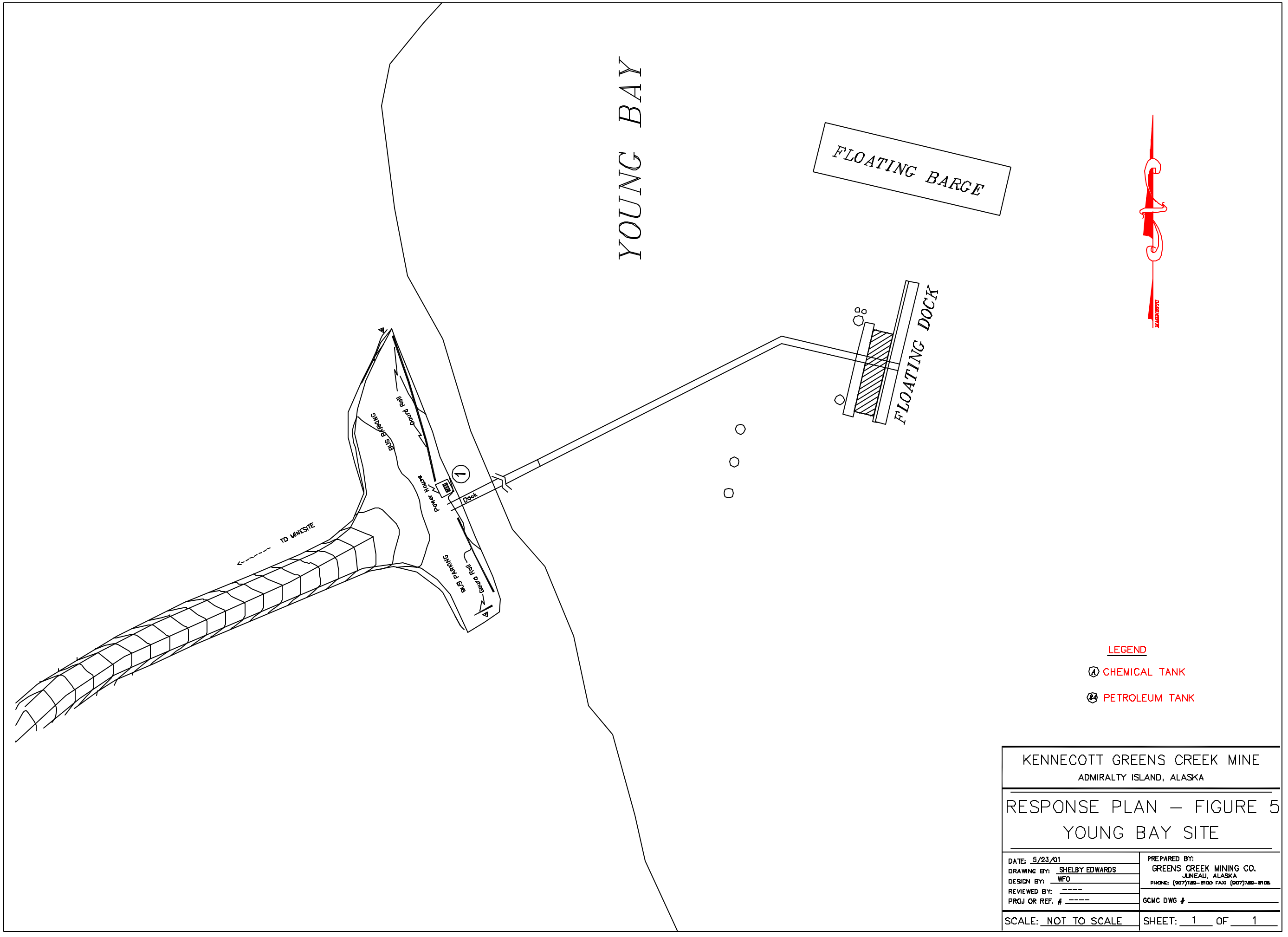
KENNECOTT GREENS CREEK MINE

ADMIRALTY ISLAND, ALASKA

RESPONSE PLAN – FIGURE 4

HAWK INLET PLAN

DATE: 5/23/01	PREPARED BY: GREENS CREEK MINING CO. JUNEAU, ALASKA PHONE: (907)789-5100 FAX: (907)789-5108
DRAWING BY: SHE	
DESIGN BY: WFO	
REVIEWED BY: ----	
PROJ OR REF. ----	GCMC DWG #:
SCALE: NOT TO SCALE	SHEET: 1 OF 1



LEGEND

(1) CHEMICAL TANK

(24) PETROLEUM TANK

KENNECOTT GREENS CREEK MINE

ADMIRALTY ISLAND, ALASKA

RESPONSE PLAN – FIGURE 5
YOUNG BAY SITE

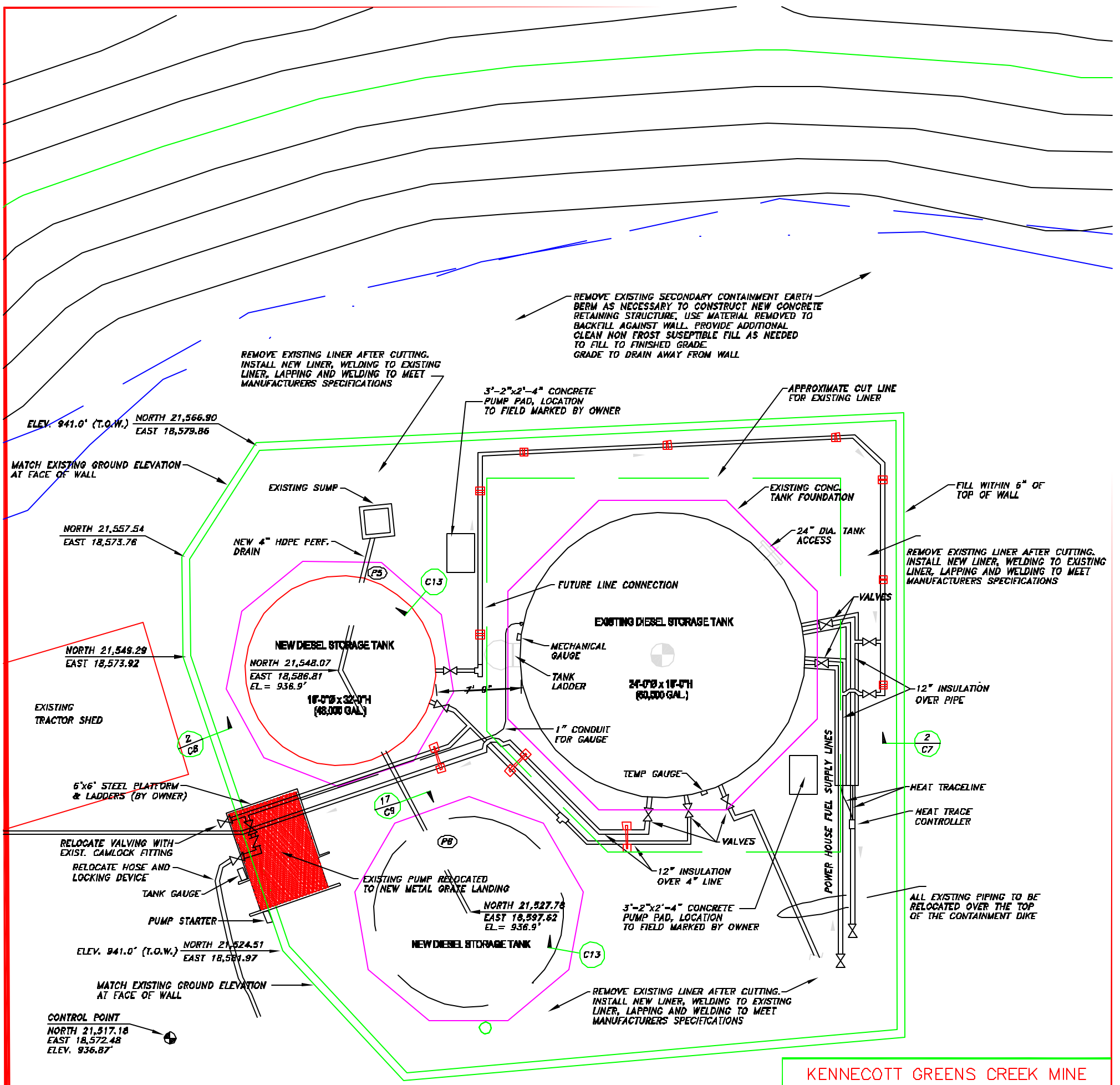
DATE: 5/23/01
DRAWING BY: SHELBY EDWARDS
DESIGN BY: WFO
REVIEWED BY: ----
PROJ OR REF. #: ----

PREPARED BY:
GREENS CREEK MINING CO.
JUNEAU, ALASKA
PHONE: (907)780-8100 FAX: (907)780-8105

GCMC DWG #:

SCALE: NOT TO SCALE

SHEET: 1 OF 1



– NOTE –
SEE SHEET 17 FOR DRAIN PIPE SUMMARY

– NOTE –
SURVEY TOPOGRAPHY AND SURVEY CONTROL PROVIDED BY THE OWNER
PLEASE CONTACT SHELBY EDWARDS AT 790-8441 FOR ADDITIONAL INFORMATION

Note:
1.) Spill Response Equipment is located at the following 920 facilities–
Surface shop, Powerhouse, Concentrator Reagent Storage and Warehouse.
2.) Fire Suppression Equipment is located –
75' east (fire hydrant) and 125' west (fire hydrant) of the 920 Bulk Storage Facility.

KENNECOTT GREENS CREEK MINE
ADMIRALTY ISLAND, ALASKA

RESPONSE PLAN – FIGURE 6
920 MILL SITE BULK STORAGE

DATE: 5/23/01
DRAWING BY: SHE
DESIGN BY: WFO
REVIEWED BY: ----
PROJ OR REF.: ----
SCALE: NOT TO SCALE

PREPARED BY:
GREENS CREEK MINING CO.
JUNEAU, ALASKA
PHONE: (907)789-6100 FAX: (907)789-6108

CONC DWG #
SHEET: 1 OF 1

REMOVE EXISTING LINER AFTER CUTTING. INSTALL NEW LINER WELDING TO EXISTING LINER LAPPING AND WELDING TO MEET MANUFACTURERS SPECIFICATIONS

REMOVE EXISTING LINER AFTER CUTTING. INSTALL NEW LINER WELDING TO EXISTING LINER LAPPING AND WELDING TO MEET MANUFACTURERS SPECIFICATIONS

EDGE CONC

DIESEL

GAS

TOP OF BERM

NEW DIESEL STORAGE TANK

22'-0"Øx40'-0" H (113,700 GAL.)

NEW DIESEL STORAGE TANK

22'-0"Øx40'-0" H (113,700 GAL.)

NEW DIESEL STORAGE TANK

22'-0"Øx40'-0" H (113,700 GAL.)

FUEL TANK

EXCAVATE AND RESHAPE DIKE AS NECESSARY TO ALLOW CONSTRUCTION OF TANK FOUNDATION

OIL SEPARATOR TANK

WATER DISCHARGE

EXISTING CONCRETE PAD

EXISTING FUELING AREA

REMOVE EXISTING WOOD STAIRWAY AND LANDING AND CONSTRUCT NEW STEEL STEPS AND LANDING (BY OWNER)

CONNECT PIPE P-4 TO EXISTING SUMP

CURB

GEN BLDG

8" STL PIPE

EXISTING UNDERGROUND ELECTRICAL

CONCENTRATE STORAGE BUILDING

WHEELWASH BUILDING

OIL TANK

ENVIRO BLDG.

8" FIRE LINE
2" FIRE RESERT
2" FRESHWATER

2" FRESHWATER

6" FIRE LINE

Note:
1.) Spill Reponse Equipment is stored in 20' SEAPRO container at top of "Miss Rene" ramp.

2.) Fire Suppression Equipment is located 75' south (Dry chemical—Gen Bldg) and 150' south (fire hydrant) of Hawk Inlet Bulk Storage Facility.

KENNECOTT GREENS CREEK MINE

ADMIRALTY ISLAND, ALASKA

RESPONSE PLAN — FIGURE 7
HAWK INLET PLAN BULK STORAGE

DATE: 5/23/01
DRAWING BY: SHE
DESIGN BY: WFO
REVIEWED BY: ----
PROJ OR REF. ----

PREPARED BY:
GREENS CREEK MINING CO.
JUNEAU, ALASKA
PHONE: (907)789-8100 FAX: (907)789-8108

GCMC DWG #

SCALE: NOT TO SCALE

SHEET: 1 OF 1

KENNECOTT GREENS CREEK MINING COMPANY

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN

APPENDIX C

CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CRITERIA CHECKLIST

CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CHRITERIA CHECKLIST

FACILITY NAME: Kennecott Greens Creek Mining Company, Greens Creek Mine

FACILITY ADDRESS: P.O. Box 32199, Juneau, AK 99803-2199

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?
   YES X NO __.

2. Does the Facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest above ground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?
   YES___ NO X .

3. Does the Facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance such that a discharge from the facility could cause injury to fih and wildlife and sensitive environments?
   YES___ NO X .

4. Does the Facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance such that a discharge from the facility would shut down a Public drinking water intake?
   YES___ NO X .

5. Does the Facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?
   YES___ NO X .

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that to the my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

William F. Oelklaus _____
Name Signature

Facility Environmental Manager 18 May 2000 .
Title Date

KENNECOTT GREENS CREEK MINING COMPANY

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN

APPENDIX D

SPCC INSPECTION FORMS

GREENS CREEK MINING COMPANY

SPCC Checklist

These checklists are to be used by Greens Creek personnel in checking the spill prevention measures in effect at the Greens Creek Mine. These lists should be used during the semi-annual facility review and weekly inspections. Any shortcomings should be reported to the Environmental Manager for follow-up actions required. Every effort should be made to correct problems at the local level whenever feasible.

SPCC INSPECTION

HAWK INLET

____ Are containment/diversionary structures in place and operating correctly?

____ Is the containment berm gate valve closed and locked?

____ Are the flange and expansion joints in good working condition? (ie. no rust, leaks, metal wear, bent flanges, etc.)

____ Are all of the valve glands and bodies in good working order?

____ Are all of the pipelines in good working condition? Is pipeline leak free?

____ Are all of the pipeline supports in place? Are all the supports undamaged?

____ Is the pipeline clearly marked and painted?

_____ Any signs of deterioration on the 200,000 gal. or the two 10,000 gal. fuel tanks or their supports?

____ Are the loading/unloading connections of pipelines securely capped or blank-flanged when not in service?

____ Are drip pans in place under all of the pipeline connections?

_____ Is the master flow and drain valves and any other valves that permit direct outward flow of a storage tank's contents securely locked in the closed position when in a nonoperating status?

____ Are sorbent materials readily available to the fuel operator?

_____ Is the drainage collection ditch clear and collecting runnoff?

COMMENTS:

_____

_____

_____

_____

SPCC INSPECTION

920 MINE SITE

____ Are containment/diversionary structures in place and operating correctly?

____ Is the containment berm gate valve closed and locked?

____ Are the flange and expansion joints in good working condition? (ie. no rust, leaks, metal wear, bent flanges, etc.)

____ Are all of the valve glands and bodies in good working order?

____ Are all of the pipelines in good working condition? Is pipline leak free?

____ Are all of the pipeline supports in place? Are supports undamaged?

____ Is the pipeline clearly marked and painted?

_____ Any signs of deterioration on the 60,000 gal. fuel tanks or it's supports?

____ Are the loading/unloading connections of pipelines securely capped or blank-flanged when not in service?

____ Are drip pans in place under all of the pipeline connections?

_____ Is the master flow and drain valves and any other valves that permit direct outward flow of a storage tank's contents securely locked in the closed position when in a nonoperating status?

____ Are sorbent materials readily available to the fuel operator?

COMMENTS:

_____
_____
_____
_____
_____
_____

SPCC INSPECTION

DAY TANKS INSPECTION

Tank Site	Condition	Leaks	Spills
North Cannery - Diked Tank (DT)			
Cannery Power House - GAS			
Core Shed - DT			
Pit 5 Generator - DT			
Hawk Inlet Services - DT			
920 Warehouse - DT			
Hawk Inlet Used Oil Tank 10,000 gallon			

COMMENTS:

_____
_____
_____
_____
_____
_____
_____

SPCC INSPECTION

BULK OIL CONTAINMENT

____ Does the maintenance building oil containment area appear sound, i.e., no cracks, holes, etc.?

____ Is there standing water in the containment area?

____ Do the bulk oil tanks appear sound, i.e., no rust, missing plugs, etc.?

____ Are the drip pans in place?

____ Is there a preponderance of spilled oil in area?

COMMENTS:

_____
_____
_____
_____
_____
_____