APPENDIX 3

UPDATE OF

DECOMMISSIONING AND RECLAMATION

SCHEDULE

POLARIS MINE - DECOMMISSIONING & RECLAMATION SCHEDULE

UPDATED AS OF December 31, 2003

ACTIVITY	Prior Periods	4th Qtr. 2003			1st Qtr. 2004			2nd Qtr. 2004			3rd Qtr. 2004			Percent Complete As Of Dec 31/03
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
CONTRACTOR MOBILIZATION														
Pre-mobilization Planning / Order Materials/Equip														
Ship to Site with Contractor Equipment														100%
Offload Ship														100%
Setup Warehousing/Laydown Area														100%
SETUP TEMPORARY FACILITIES														100%
DECOMMISSIONING UNDERGROUND														
Remove / Salvage Mine Equipment & Crusher	Cancelled													100%
Remove Refrigeration Plant														0%
Remove Surface Ventilation Fans														0%
Seal Mine Openings														0%
MILL / BARGE DEMOLITION														
Initial Cleanup of Barge by Teck Cominco														100%
Removal of Barge Services														98%
Transfer fuel to Tank Farm & Clean Hull														100%
Remove hazardous Materials / Wastes														100%
Remove / Salvage Process Equipment														100%
Demolish Internal Equipment														100%
Demolish Structure														100%
Remove Hydrocarbon/Metals Contaminated Soils														55%
Regrade Area Surounding Barge														25%
PRODUCT STORAGE BUILDING DEMOLITION														
Cleanup of Building / Remove Liquids from Equip.														100%
Demolish Exterior Conveyors														100%
Demolish Reclaim Conveyors														100%
Remove Cladding from Building														100%
Demolish Structure														100%
Demolish Foundations														98%
Remove Contaminated Soils (Building & Adj. Areas)														60%
Regrading Area														10%
SHIP LOADER / RECLAIM CONVEYOR DEMOL.														
Cleanup of Conveyor Areas/Remove Oils														100%
Demolish Conveyors														100%

POLARIS MINE - DECOMMISSIONING & RECLAMATION SCHEDULE

UPDATED AS OF December 31, 2003

ACTIVITY	Prior Periods	4th Qtr. 2003			1st Qtr. 2004			2nd Qtr. 2004			3rd Qtr. 2004			Percent Complete As Of Dec 31/03
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
DOCK DECOMMISSIONING														
Inspect / Remove Glycols from Freeze Pipes														100%
Remove Metals Contaminated Soils														95%
Remove Cells 1 & 2														75%
Remove Cells 3 & 4														75%
Removal of Temporary Dock														0%
Shoreline Recontouring														70%
Berm Removal														65%
Grade New Beach to Final Profiles														25%
TAILINGS SYSTEM DEMOLITION														
Final Cleanup of Thickener (by Operations)														100%
Flush Tails Lines														100%
Salvage Equipment														100%
Remove hazardous Materials / Wastes														100%
Remove Tails Line / Return Line														80%
Demolish Equipment														100%
Demolish Structure														100%
Remove Foundations														100%
Remove Contaminated Soils														100%
Regrading														100%
Final Cleanup of Area														95%
GARROW LAKE / DAM DECOMMISSIONING														
Drawdown Lake														100%
Removal of Centre Section of Dam														75%
Creek Channel Construction														0%
Final Grading / Armouring of Dam Remnants														0%
CRF PLANT DEMOLITION														
Final Cleanup of Plant														100%
Remove hazardous Materials / Wastes														100%
Demolish Plant Equipment														100%
Demolish Buildings														100%
Site Grading (Plant & Surrounding Area)														100%

POLARIS MINE - DECOMMISSIONING & RECLAMATION SCHEDULE

UPDATED AS OF December 31, 2003

ACTIVITY	Prior Periods	4th Qtr. 2003			1st Qtr. 2004			2nd Qtr. 2004			3rd Qtr. 2004			Percent Complete As Of Dec 31/03
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
ACCOMODATIONS COMPLEX DEMOLITION														
Establish Temporary Offices / Building Services														100%
Use Accomodations Complex														75%
Establish Temporary Camp Accomodations														0%
Use Temporary Camp														0%
Remove hazardous Materials / Wastes														0%
Demolish Buildings														0%
Regrade Area														0%
Remove Temporary Camp														0%
FUEL STORAGE (TANK FARM) DEMOLITION														
Use with Temporary Modifications														100%
Transfer Fuel to Temporary Storage														0%
Cleaning of Tanks / Piping														60%
Demolish Tanks / Piping														0%
Cleanup of Berm & Liner														0%
Site Grading														0%
BLADDER AREA CONTAMINATED SOILS														
Cleanup of Hydrocarbon Soils														100%
Area Grading														100%
MISC. BUILDING DEMOLITION														
Exploration Quonset Huts														100%
Core Shack (Atco Trailer)														100%
Emergency Shelter at North Portal														0%
Steam Wash Bay & Tire Shop (relocated in 3rd Qtr)														50%
Generator Building														0%
Bent Horn Building														0%
Dock Office Trailer														0%
Airstrip Storage Hut														0%
Fresh Water Pump House														0%
Frsh Water Tank & Shed														0%
Carpenter Shop (used as temp. warehouse)														0%
Shipping Containers (Sea Cans - more to move on-going)														50%
Foldaways by Temporary Dock (3)														0%
Firehall														0%

POLARIS MINE - DECOMMISSIONING & RECLAMATION SCHEDULE

UPDATED AS OF December 31, 2003

ACTIVITY	Prior Periods	4th Qtr. 2003			1st Qtr. 2004			2nd Qtr. 2004			3rd Qtr. 2004			Percent Complete As Of Dec 31/03
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
OPERATIONAL LANDFILL CLOSURE														
Reclocate Construction Landfill														100%
Hauling Landfill Cover Cap Material														98%
LRD QUARRY Landfill														
Cut Notch into Quarry / Construct Haul Road														100%
Installation of Thermistor Pipe Stands														100%
Placing debris in Quarry														80%
Grading of Notch to Match Cap														75%
Placement of Cap and Final Grading														0%
Installation of Thermistors (pipes installed)														20%
MISC. SITE RECLAMATION & EARTHWORKS														
Reduction in spare parts/supplies by TCML														100%
Ship Mill Process Chemicals South for Sale/Recycle														100%
Site Cleanup of scrap material during operations														100%
Regrading North 40 Area														80%
Grading of Reclamation Landfill Area														90%
Road Closure / Culvert Removals/Runway														15%
DEMOBILIZE FROM SITE														
Prepare Equipment / Supplies for shipping from site														5%
Prepare Residual Chemicals / Wastes for shipping														85%
Last Ship from Polaris														0%

APPENDIX 4

UPDATE OF ESTIMATED

MINE DECOMMISSIONING, RECLAMATION

AND

MONITORING COSTS

POLARIS MINE DECOMMISSIONING, RECLAMATION AND MONITORING COST ESTIMATE
4th QUARTER 2003 UPDATE

	BUDGET		DEC 31, 2003 CLAIMED TO DATE		FORECAST FINAL PROJECT COST		COST VARIANCES		COMMENTS
	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	
LANDFILL RECLAMATION									
Landfill Reclamation	432,000		807,804		886,544		454,544		
		$ 432,000		$ 807,804		$ 886,544		$ 454,544	Scope of work has not changed. Underbudgeted unit costs here.
CONTAMINATED SOILS - CLEANUP									
Metals & Hydrocarbon Contaminated Soils Cleanup & Disposa	366,623		1,135,061		1,696,023		1,329,400		
Hydrocarbon Contaminated Soils (By Polaris)	6,097		13,131		13,131		7,034		
Metals Contaminated Soils (By Polaris)	173,605		52,382		52,382		-121,223		
U/G Handling & Disposal Of Contaminated Soils	48,675		435,455		659,993		611,318		
		$ 595,000		$ 1,636,029		$ 2,421,529		$ 1,826,529	Volumes of contaminated soils have substantially increased from budget
QUARRIES & MINE SURFACE RECLAMATION (EARTHWORK)									
Backfill & Re-Contouring	263,000		179,158		502,127		239,127		
		$ 263,000		$ 179,158		$ 502,127		$ 239,127	General site contouring is taking more labour than expected. Was a hard item to quantify for budget purposes as it is a subjective item (i.e. no quantities to base
MISC. DEMOLITION & CLEAN-UP									
Misc Unallocated Clean-Up / Demo	380,000		41,483		41,405		-338,595		
		$ 380,000		$ 41,483		$ 41,405		$ (338,595)	Demolition has been proceeding much better than planned.
EQUIPMENT PURCHASE/RENTAL									
Contractor Equipment Rental	5,274,900		3,370,804		5,037,786		-237,114		
Contractor Misc Equipment Purchase	719,407		432,906		432,906		-286,501		
Escalation Allowance	59,693				-		-59,693		
		$ 6,054,000		$ 3,803,710		$ 5,470,692		$ (583,308)	Obtained better unit rates for equipment rental than budgeted and have had to purchase less other equipment than anticipated (i.e. made better use of surplus mine equipment
MISC. SERVICES & SUPPLIES									
Misc Purchased Materials / Supplies	235,333		166,943		166,943		-68,390		than planned)
Escalation Allowance	19,667				-		-19,667		
		$ 255,000		$ 166,943		$ 166,943		$ (88,057)	
FUEL									
Fuel Supply	3,294,536		4,216,186		4,216,186		921,650		
Fuel Taxes (Heating & Power Generation)	68,677				99,727		31,050		
Fuel Taxes (Equipment)	467,343		412,415		677,493		210,150		
Escalation Allowance	157,444				-		-157,444		
		$ 3,988,000		$ 4,628,601		$ 4,993,406		$ 1,005,406	Increased soils quantities are resulting in increase fuel usage
MAINTENANCE OF EQUIPMENT & FACILITIES									
Mobile Equip Maintenance	1,296,759		4,590,733		5,645,832		4,349,073		
Building Maintenance	506,923		1,519,163		2,233,674		1,726,751		
Escalation Allowance	101,318				-		-101,318		
		$ 1,905,000		$ 6,109,896		$ 7,879,506		$ 5,974,506	Single biggest variance due to a combination of underestimating cost per hour of maintenance plus additional quantity of contaminated soils means equipment is used
PRE - PURCHASED EQUIPMENT (BY COMINCO)									
Construction Equipment - Purchase (By Owner)	541,000		541,271		541,271		271		more and later into the fall which is hard on the equipment.
		$ 541,000		$ 541,271		$ 541,271		$ 271	
CONTRACTOR'S FIELD SUPPORT & SUPPLIES									
TRANSPORTATION (SHIPPING)									
Packing & Preparation	85,326		60,035		70,035		-15,291		
Shipping Costs	948,661		1,583,252		2,343,952		1,395,291		
Escalation Allowance	78,013				-		-78,013		
		$ 1,112,000		$ 1,643,287		$ 2,413,987		$ 1,301,987	Transportation unit costs are higher than budgeted as well as increased quantities due
CONTRACTOR MOB, DEMOB & SUPERVISION									to additional soils volumes (increased parts / supplies required to be shipped)
Contractor Mob/Demob	61,883		99,988		233,463		171,580		
Contractor Supervisory/Admin Personnel	2,127,339		2,432,983		3,787,759		1,660,420		
Safety Services & Supplies	36,000		272,192		356,848		320,848		
Misc Temporary Services / Modifications	223,824		930,603		1,359,454		1,135,630		
Escalation Allowance	13,954				-		-13,954		
		$ 2,463,000		$ 3,735,766		$ 5,737,524		$ 3,274,524	Additional soils quantities require additional manpower and supervision. Contractor is
MISC. SERVICES & SUPPLIES									also using more supervisors than would in the south for supvervising crews.
Communications & TV	374,000		105,302		196,235		-177,765		
Escalation Allowance	31,000				-		-31,000		
		$ 405,000		$ 105,302		$ 196,235		$ (208,765)	Anticipated higher communication costs than being experienced.
ACCOMODATIONS									
Catering	1,487,166		1,468,033		2,154,395		667,229		
Escalation Allowance	122,834				-		-122,834		
		$ 1,610,000		$ 1,468,033		$ 2,154,395		$ 544,395	Increased manpower levels have increased catering/housekeeping costs.
TRAVEL & PERSONNEL									
Travel (Airfares & Expenses)	1,552,881		2,691,525		4,381,247		2,828,366		
Travel Premium - Revised Rotation Schedule	1,072,773				-		-1,072,773		
Misc Personnel Transport	72,274		168,527		246,505		174,231		Unit costs for air travel has increase beyond normal escalation rates, poor weather has
Escalation Allowance	575,072				-		-575,072		added to layover costs and increase crew levels has increased the number of
		$ 3,273,000		$ 2,860,052		$ 4,627,752		$ 1,354,752	passengers traveling.

POLARIS MINE DECOMMISSIONING, RECLAMATION AND MONITORING COST ESTIMATE
4th QUARTER 2003 UPDATE

	BUDGET		DEC 31, 2003 CLAIMED TO DATE		FORECAST FINAL PROJECT COST		COST VARIANCES		COMMENTS
	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	
CONTRACTOR INDIRECTS									
HO MOB & DEMOB SUPPORT									
Mob & Demob	1,912,000		1,526,300		1,912,376		376		
		$ 1,912,000		$ 1,526,300		$ 1,912,376		$ 376	
CONTRACTOR MANAGEMENT SUPPORT									
Personnel	3,928,932		2,391,496		3,928,932		0		
Safety & First Aid Personnel to Provide Overlap	184,068		111,792		183,644		-424		
		$ 4,113,000		$ 2,503,288		$ 4,112,576		$ (424)	
OTHER CONTRACTOR INDIRECTS									
Contractor's General Indirects	4,952,000		4,435,584		5,121,490		169,490		
		$ 4,952,000		$ 4,435,584		$ 5,121,490		$ 169,490	Contractors offsite costs increasing due to increased work load on site.
ENGINEERING / PROJECT MANAGEMENT									
ENVIRONMENTAL SITE ASSESMENT									
Environmental Consultants - Site Assesment	275,787		300,113		318,777		42,990		
Site Assessment - Unallocated	207,874		105,263		191,524		-16,350		
Escalation Allowance	2,339				-		-2,339		
		$ 486,000		$ 405,376		$ 510,301		$ 24,301	
CLOSURE PLAN									
Environmental Consultants - Closure Plan	415,772		372,272		372,272		-43,500		
Escalation Allowance	2,228				-		-2,228		
		$ 418,000		$ 372,272		$ 372,272		$ (45,728)	
ENGINEERING / SPECIAL CONSULTANTS									
Design Consultants - Dock / Loadoul	1,316		1,413		1,413		97		
Design Consultants - Tailings / Garrow Lake	3,520		3,515		3,515		-5		
Design Consultants - Dock / Loadoul	79,684		65,354		79,994		310		
Design Consultants - Tailings / Garrow Lake	54,780		45,328		45,328		-9,452		
Sitework & Demolition Procedures - Design Services	18,300		14,465		55,400		37,100		
Escalation Allowance	2,400				-		-2,400		
		$ 160,000		$ 130,075		$ 185,650		$ 25,650	
PROJECT MANAGEMENT CONSULTANT (HO STAFF)									
Project Management - Salaries	411,069		866,433		1,093,738		682,669		
Project Management - Reimb Expenses	100,000		58,182		82,378		-17,622		
Escalation Allowance	31,931				-		-31,931		
		$ 543,000		$ 924,615		$ 1,176,116		$ 633,116	Complexities in dealing with contractor has increase work load of project manager.
CONSTRUCTION MANAGEMENT (FIELD STAFF)									
Construction Management - Salaries	2,142,878		1,160,877		1,746,990		-395,888		
Escalation Allowance	179,122				-		-179,122		
		$ 2,322,000		$ 1,160,877		$ 1,746,990		$ (575,010)	On site environmental personnel have helped reduce personnel requirements here.
ENVIRONMENTAL TESTING AND SAMPLING									
Environmental Reclamation Supervision - Staff	337,123		330,866		668,060		330,937		
Escalation Allowance	29,550				-		-29,550		
Environmental Reclamation Supervision - Testing	330,000		103,895		239,060		-90,940		
Additional Sampling and Consultant Services (MMER)	0		165,670		396,192		396,192		
Escalation Allowance	26,327				-		-26,327		
		$ 723,000		$ 600,431		$ 1,303,312		$ 580,312	Are using higher personnel levels due to increased soild quantities.
OWNER'S COSTS									
SALARIES & EXPENSES									
Teck Cominco HO Proj Mgmnt (Staff Lab)	374,631		353,762		563,132		188,501		
Teck Cominco HO Proj Mgmnt (Misc Material & Exp)	199,149		136,732		178,333		-20,816		
Escalation Allowance	34,220				-		-34,220		
		$ 608,000		$ 490,494		$ 741,465		$ 133,465	Work loads for proejct personnel have been higher than expected.
OVERHEAD / HO SUPPORT									
Land Leases, Licences	175,000		96,949		237,603		62,603		
Miscellaneous Permits	45,000		11,118		14,222		-30,778		
Insurance	445,900		91,332		174,310		-271,590		
Property Taxes	495,000		119,705		495,000		0		
Home Office General Admin (Labour & Exp)	722,384		16,150		30,000		-692,384		
Public Relations	74,292		58,718		74,292		0		
Legal	57,540		48,021		68,431		10,891		
Escalation Allowance	168,560				-		-168,560		
Misc Owner's Overhead	6,324		13,882		13,882		7,558		
		$ 2,190,000		$ 455,875		$ 1,107,740		$ (1,082,260)	Home office support has been less than anticpated. Offset somewhat by project management personnel
GENERAL ADMIN									
Closure Management - Polaris Personnel	54,000				-		-54,000		
Escalation Allowance	2,880				-		-2,880		
Closure Wrap Up	5,120		34,327		45,667		40,547		
		$ 62,000		$ 34,327		$ 45,667		$ (16,333)	

POLARIS MINE DECOMMISSIONING, RECLAMATION AND MONITORING COST ESTIMATE
4th QUARTER 2003 UPDATE

	BUDGET		DEC 31, 2003 CLAIMED TO DATE		FORECAST FINAL PROJECT COST		COST VARIANCES		COMMENTS
	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	
POST RECLAMATION COSTS (2005 - 2011)									
SITE MONITORING AND HOLDING COSTS									
Annual Post Closure Environmental Monitoring (2005 to 2011)	510,000		-		510,000		0		
Final Sampling Program, Data Evaluation and Reporting in 2011	160,000		-		160,000		0		
Land Lease/Licence costs from 2005 to 2011	126,000		-		126,000		0		
Property Taxes - 2005 to 2011	70,000		-		70,000		0		
Escalation Allowance	135,000		-		135,000		0		
		$ 1,001,000		$ -		$ 1,001,000		$ -	
UNALLOCATED									
Uncoded Forecast Cost Adjustments (Net)	-		(310)		133,272		133,272		
		$ -		$ (310)		$ 133,272		$ 133,272	These costs will be distributed as the job proceeds.
TOTAL DECOMMISSIONING / RECLAMATION & MONITORING COSTS		**$ 47,500,000**		**$ 43,655,492**		**$ 62,311,705**		**$ 14,811,705**	

APPENDIX 5

RECORD OF DEBRIS PLACED

INTO

LITTLE RED DOG QUARRY LANDFILL

PLACEMENT OF DEBRIS INTO LRD QUARRY LANDFILL

4th QUARTER, 2003

DRAWING OF WASTE PLACEMENT

Very little debris was placed into Little Red Dog Quarry Landfill (LRDQL) during the quarter. Demolition of the Concentrate Storage Shed and Barge were completed in the previous quarter. The attached drawing indicates the areas where debris was placed to the end of the year. The locations represent the final placement locations and not temporary staging areas. The drawing also includes locations of debris placed prior to the beginning of the quarter where the debris was placed at the same elevation in the quarry.

The drawing represents the Third Lift (L3) of debris in the quarry. This lift is being placed into Bench 6 of Little Red Dog Quarry Landfill ('LRDQL'). The drawing indicates Blue for the debris placed in the 4th Quarter. The red colour is the position at the end of the 3rd Quarter as previously submitted. Each area is dated, for example 'L3 – 2003 – 12' represents Lift 3, for the month of December, 2003.

While there was very little debris placed during the quarter efforts to reduce the sizes of previously placed hull sections resulted in debris being cut off and spread out over the remained of Lift 3.

RECORD OF WASTE SOURCE/VOLUME & TYPE

Following the placement drawings are records from each month showing the source of the debris, where it was hauled to, the quantity and the type of debris. As previously stated, little debris was land filled during the quarter.

VERIFICATION OF HYDROCARBON REMOVAL

There was no equipment that required hydrocarbon removal during the period.

PHOTOGRAPHIC RECORD

As specified in the Closure Plan, a photographic record of debris placement is being maintained. Attached to this appendix are pictures of typical debris being placed in LRDQL. As there was little debris placed into LRDQL during the quarter, fewer pictures were taken than in the previous two quarters. Lack of light prevented pictures from being taken in December.

POLARIS MINE DEBRIS DISPOSAL IN LITTLE RED DOG QUARRY LANDFILL - 4th QUARTER 2003

Date	Origin Location	Disposal Location	Material	Quantity (m3)
1-Oct-03	Storage building	L.R.D.	Steel	12
8-Oct-03	Dock	L.R.D.	Steel	30
16-Oct-03	Shoreline	L.R.D.	Steel	15
17-Oct-03	North Portal	L.R.D.	Steel	10
19-Oct-03	Barge	L.R.D.	Steel	13
6-Nov-03	North Portal	L.R.D.	Wood / Wallboard	10
13-Nov-03	Storage building	L.R.D.	Steel	160
15-Nov-03	Burn Pit	L.R.D.	Wood / Wallboard	10


2003 10 01 16:27


2003 10 17


2003 10 23 11:47


2003 10 27 12:48


2003 11 01


2000 01 01 00:20


2000 01 02 02:25

APPENDIX 6

RECORD OF PLACEMENT OF

METALS / HYDROCARBON CONTAMINATED SOILS

UNDERGROUND IN THE MINE

POLARIS MINE

4TH QUARTER, 2003 CONTAMINATED SOILS VOLUMES UPDATE

Due to increasing quantities of contaminated soils being discovered as remedial activities progressed, late in the fall of 2003 TCL directed GLL to conduct additional assessment of remaining soils contamination. This was necessary to confirm project scheduling and to assess whether there was adequate storage capacity within the mine for disposal of the remaining contaminated soils to be remediated. A drilling program was undertaken to obtain this information. In addition, remedial excavations that were underway provided information on zones of contamination as well as confirming boundaries of contamination. GLL also reviewed other existing assessment data in conjunction with the new information collected to update their evaluation of contaminated soils volumes. This review resulted identification of increased quantities of contaminated soils and the submission of TCL's letter to the NWB and INAC (dated December 19, 2003) requesting authorization to store metals contaminated soils in LRDQL, and to store the increased quantities of hydrocarbon contamination into the underground mine workings.

In response to an earlier request to store increased quantities of hydrocarbon contaminated soils in the underground mine workings, approval was received from the NWB and INAC (dated December 23, 2003). The approval contained a requirement to update the following information to the end of the 3rd Quarter, 2003 in a table:

- The original volumes of contaminated materials identified in the DRP
- The quantities of soils disposed of to date.
- The predicted volume of soils yet to be disposed of.
- The volume of the mine workings filled with contaminated soils to date and,
- The usable volume of the mine remaining available.

The two attached tables (Table 1 and Table 2) provide the above requested information. The information was updated to the end of December 2003 to make the information more current.

Table 1 lists the original estimates of quantities of contaminated soils as presented in the Decommissioning and Reclamation Plan (DRP), the volumes excavated to-date, and the forecast volume of contaminated soils remaining to be remediated. The volumes of contaminated soils presented in the DRP were limited to areas where assessments had been completed to a degree that GLL felt they had sufficient information to estimate a quantity. There were a number of areas where contaminated soils were known to exist but assessments had not been completed (i.e. sufficiently to propose the quantities) at the time the DRP was issued. This information was contained in the DRP. In Table 1 these areas are noted as 'TBA'. All of the volumes listed in Table 1 are 'in-situ' volumes. The forecast volumes of contaminated soils remaining to be excavated are considered to be

‘conservative’ values and TCL expects that actual volumes will be less than the quantities presented. As TCL has had to request increases in the volumes authorized previously, TCL wanted to ensure that current forecasts represent the ‘worst case’ and that the likelihood of exceeding these volumes was remote.

Table 2 presents the forecast volumes of soils to be remediated in both ‘in-situ’ volumess and in ‘loose’ volumes. The volumes to be disposed of are best represented as ‘loose’ volumes when comparing them to the available volume remaining in the underground mine workings. It should also be noted that the total space available in the mine was reduced by 25% to reflect that full utilization of the space is not practical.

TABLE 1
POLARIS MINE - CONTAMINATED SOILS QUARTERLY FORECAST
AS OF DECEMBER 31, 2003

Contaminated Soil Locations	DRP Forecast Volumes To Be Excavated (m^3 in-situ volume)		[3]Estimated Volumes Excavated To Date (m^3 in-situ volume)		Forecast Volumes Remaining To Be Excavated (m^3 in-situ volume)		[4]Total Volumes Contaminated Soils (m^3 in-situ volume)	
	Hydrocarbons	Metals	Hydrocarbons	Metals	Hydrocarbons	Metals	Hydrocarbons	Metals
Acommodations Complex	500	-	-	-	2,400	-	2,400	-
Concentrat Storage Shed Area	Note 1	Note 1	-	24,314	-	17,000	-	41,314
East of Concentrate Shed	-	-	-	34,038	-	5,000	-	39,038
Foldaways and Lube Storage Pad	2,000	-	-	-	25,000	2,000	25,000	2,000
Snow Dumps	-	3,500	-	3,541	-	10,000	-	13,541
Firehall Area	2,000	-	1,485	-	5,000	5,000	6,485	5,000
[5]Dock Cells	-	-	12,210	-	200	-	12,410	-
North Shore and Barge Area	20,000	85,000	28,314	30,827	45,000	5,000	73,314	35,827
CRF Plant Area	100	-	40	-	-	-	40	-
Exploration Stockpile Area		TBA	-	11,028	-	-	-	11,028
Fuel Bladder Storage Area	12,000	-	12,513	-	-	-	12,513	-
June 2002 Fuel Spill	Note 2	-	4,080	-	-	-	4,080	-
Old Crusher	-	TBA	-	1,079	-	-	-	1,079
North Portal Pb Ore Storage Area	-	TBA	-	11,352	-	-	-	11,352
Quonset Huts	TBA	-	-	-	-	-	-	-
Tails Thickener Area / Tailings Lines	TBA	3,000	-	2,183	-	-	-	2,183
Miscellaneous	-	-	628	110	-	-	628	110
TOTALS	36,600	91,500	59,270	118,472	77,600	44,000	136,870	162,472
TOTAL CONTAMINANTS		**128,100**		**177,742**		**121,600**		**299,342**

Notes:

Note 1 - DRP estimated metals contaminated soils in the Concentrate Storage Area and the Barge area together as one quantity.

Note 2 - this fuel spill ocurred after the DRP was issued so there was not estimate for it.

Note 3 - the term 'Estimated' is used because until work is completed in an area, data is based on truck counts' which is based on truck drivers correctly reporting the number of loads and assumptions on average load capacities are required. Once work in an area has been completed, a detailed survey is conducted to accurately determine final volumes excavated.

Note 4 - Forecast volumes estimated are based on 'worst' case estimates rather than on a 'most' likely basis to be conservative for planning purposes.

Note 5 - Metals contaminated soils removed from the dock were recorded with soils from the 'North Shore and Barge Area' volumes.

Abreviations:

DRP - Decommissioning and Reclamation Plan

TBA - Areas identified in the DRP as being contaminated but no estimate of volumes were made as investigations were not complete.

LRDQL - Little Red Dog Quarry Landfill

TABLE 2

POLARIS MINE - CONTAMINATED SOILS FORECAST AS OF DECEMBER 31, 2003

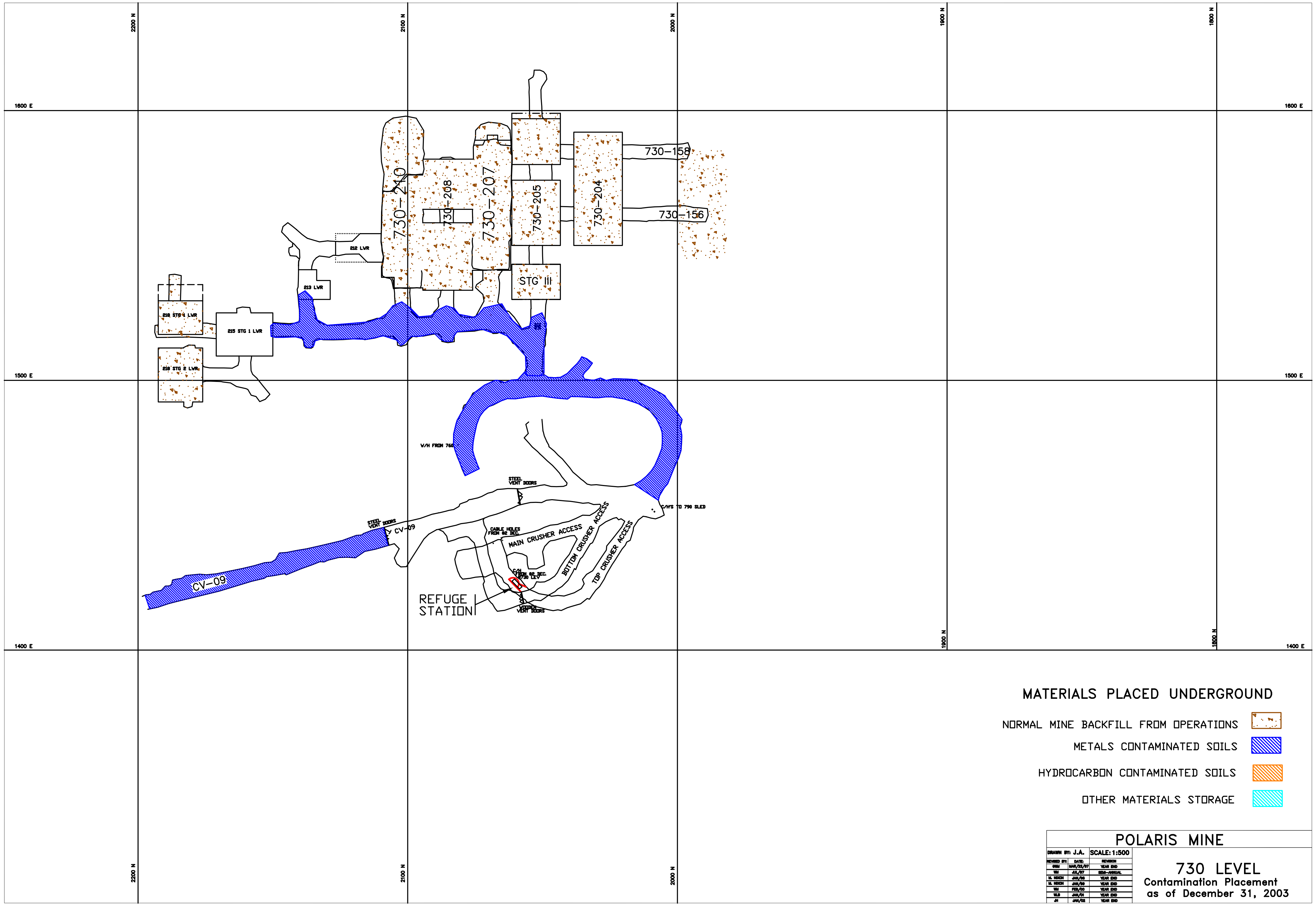
	Forecast Volume Remaining To Be Excavated (m^3 in-situ volume)		Forecast Volumes Remaining To Be Excavated [1] (m^3 loose volume)		Temporary Stockpiles To Be Disposed (m^3 loose volume)	DISPOSAL VOLUMES (m^3 loose volume)			
						LRDQL		UNDERGROUND	
Date	Hydrocarbons	Metals	Hydrocarbons	Metals	Metals	**USED**	**[2] REMAINING**	**USED**	**[3] REMAINING**
31-Dec-03	77,600	44,000	93,120	52,800	30,000	-	215,000	177,290	128,000

Notes:

1 - Used 20% swell factor from in-situ volume to loose volume

2 - Approximate space remaining to fill LRDQL to the top of Bench 5. If required additional volume is available in LRDQL

3 - Used 75% of void space available in mine to adjust for filling efficiencies



MATERIALS PLACED UNDERGROUND

NORMAL MINE BACKFILL FROM OPERATIONS

METALS CONTAMINATED SOILS

HYDROCARBON CONTAMINATED SOILS

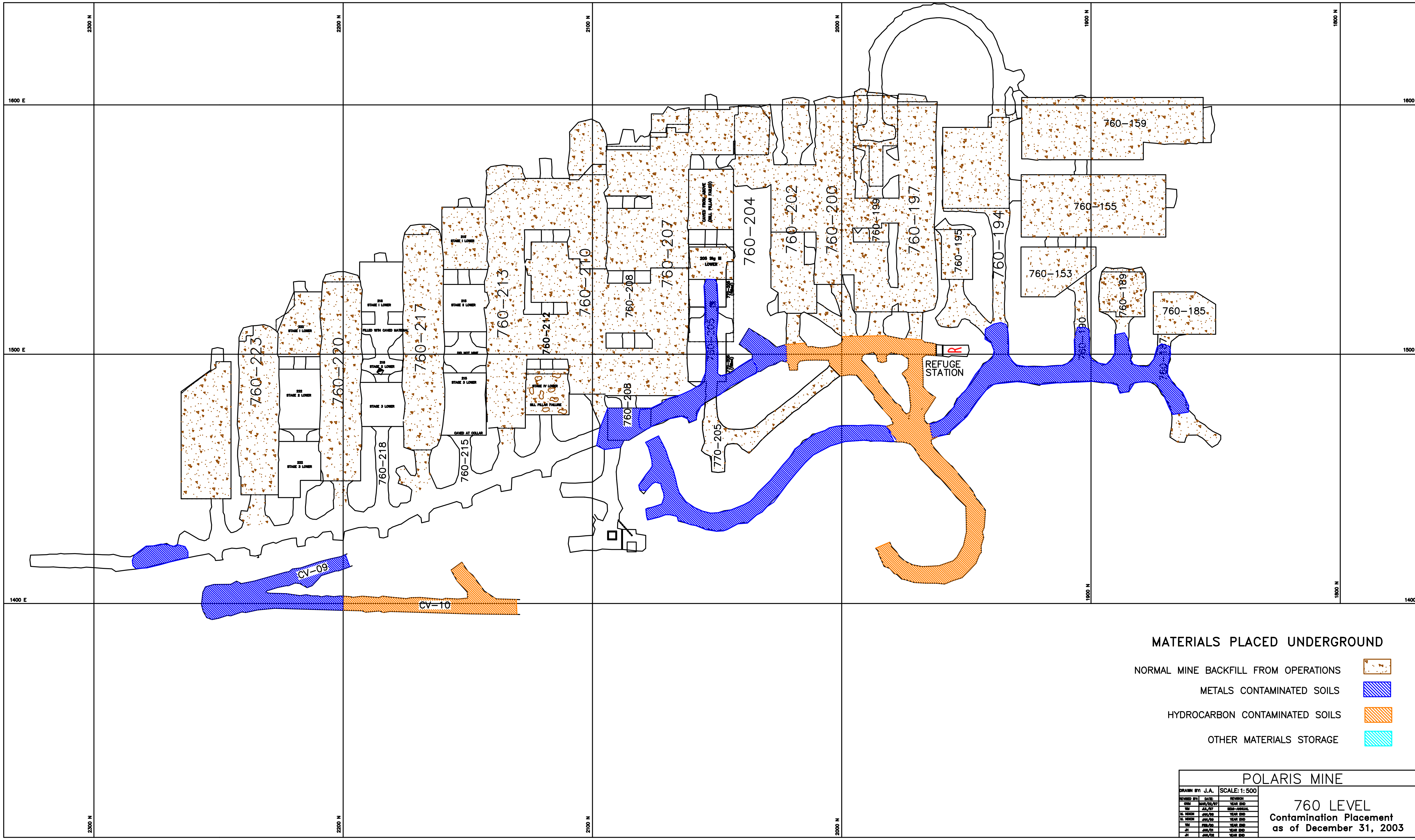
OTHER MATERIALS STORAGE

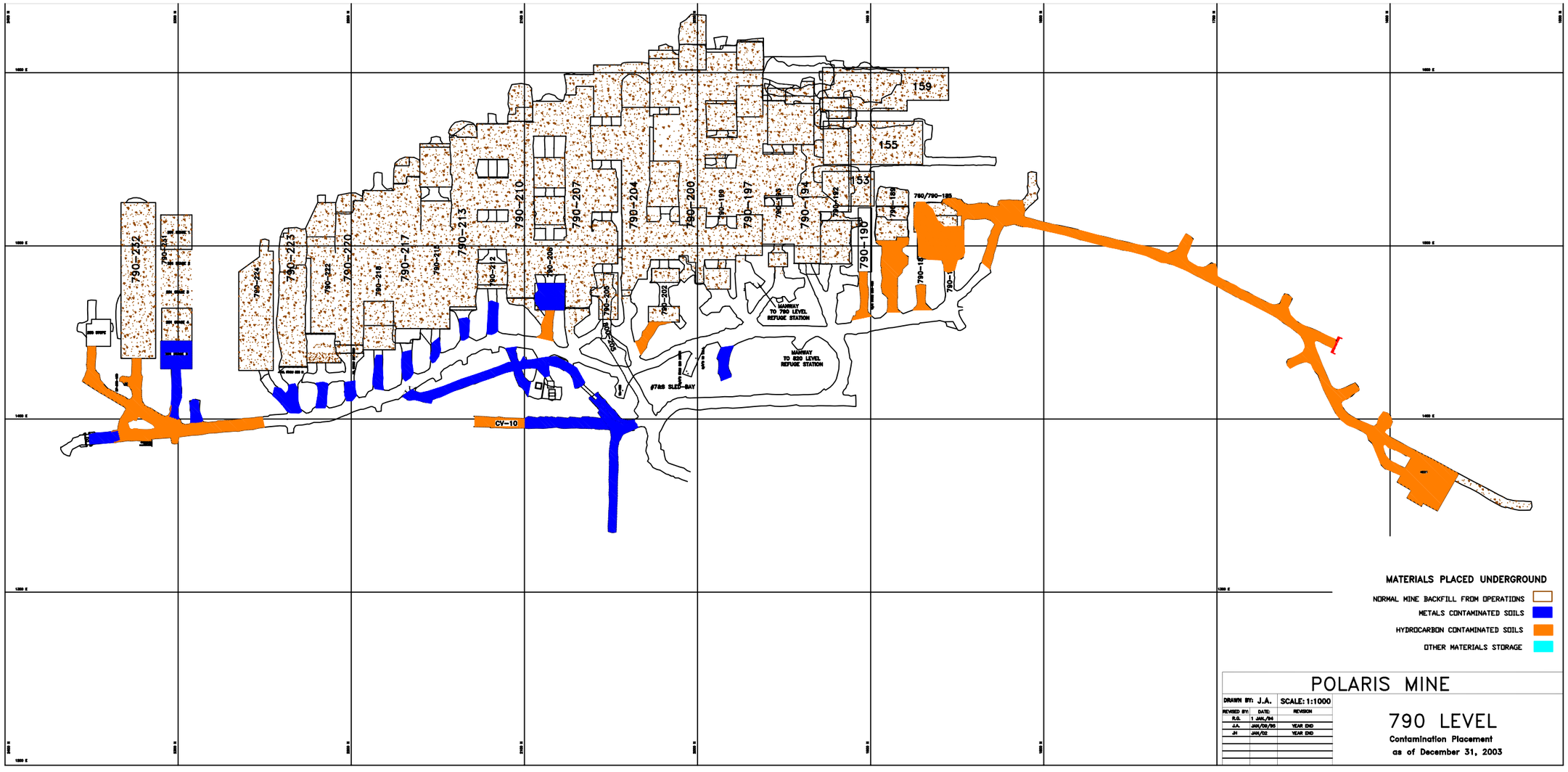
POLARIS MINE

DRAWN BY: J.A. SCALE: 1:500

730 LEVEL

Contamination Placement
as of December 31, 2003


2300 N
2200 N
2100 N
2000 N
1900 N
1800 N
1600 E
1500 E
1400 E
760-223
760-220
760-218
760-217
760-215
760-213
760-212
760-210
760-208
760-207
760-204
770-205
760-202
760-200
760-199
760-197
760-195
760-194
760-159
760-155
760-153
760-189
760-185
CV-09
CV-10
REFUGE STATION
MATERIALS PLACED UNDERGROUND
NORMAL MINE BACKFILL FROM OPERATIONS
METALS CONTAMINATED SOILS
HYDROCARBON CONTAMINATED SOILS
OTHER MATERIALS STORAGE
POLARIS MINE
DRAWN BY: J.A.
SCALE: 1:500
760 LEVEL
Contamination Placement
as of December 31, 2003



MATERIALS PLACED UNDERGROUND

- NORMAL MINE BACKFILL FROM OPERATIONS
- METALS CONTAMINATED SOILS
- HYDROCARBON CONTAMINATED SOILS
- OTHER MATERIALS STORAGE

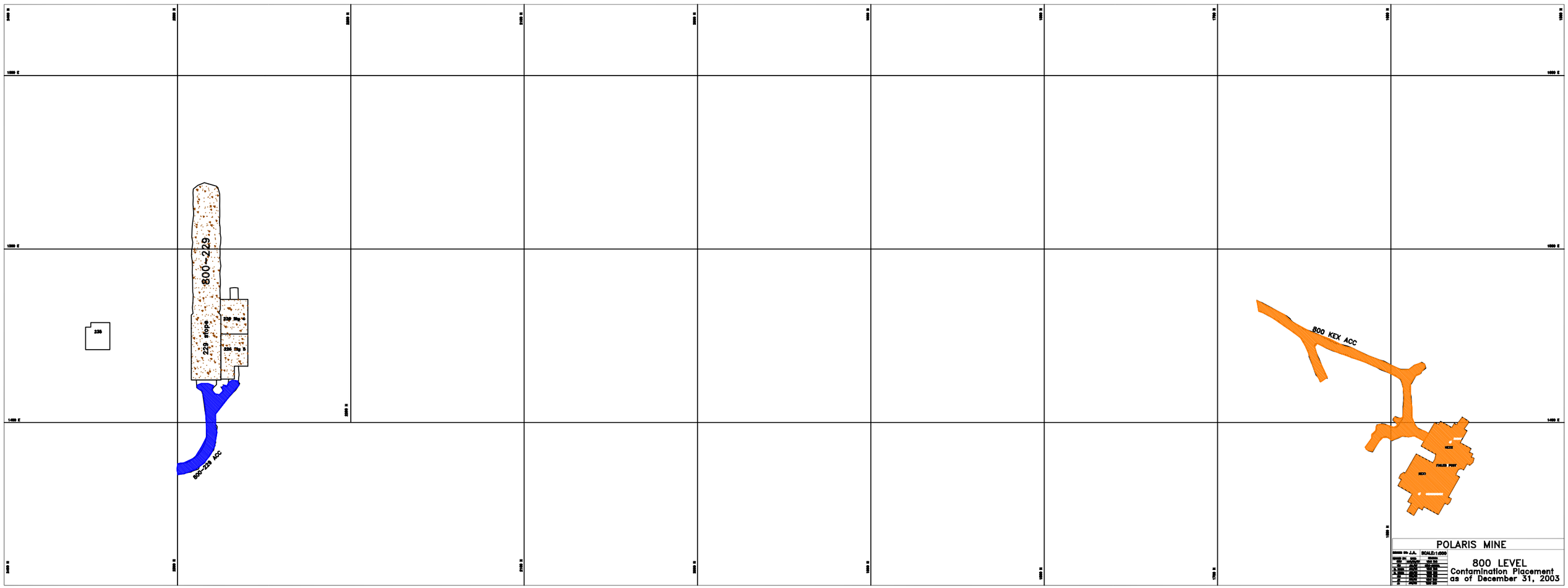
POLARIS MINE

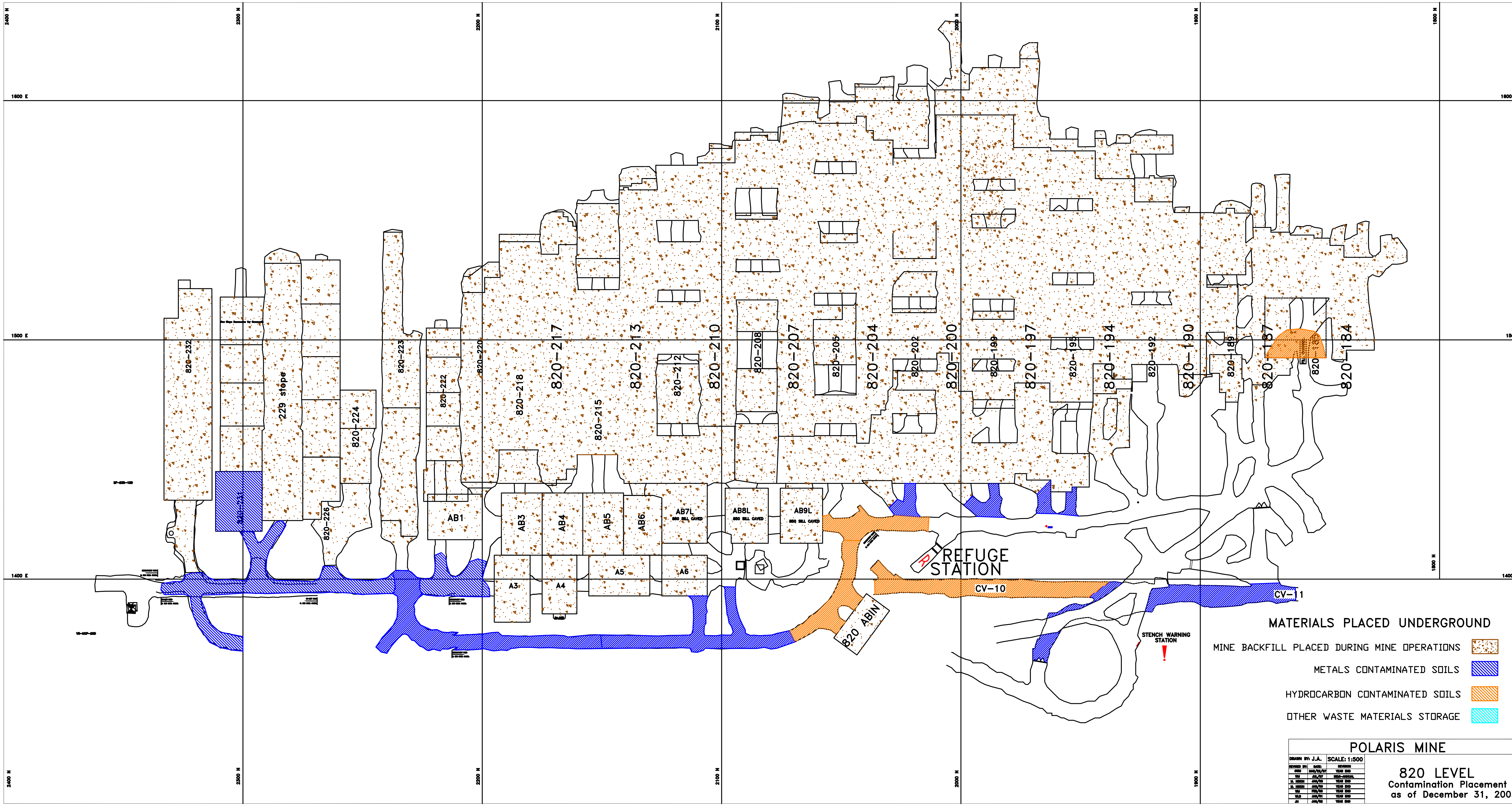
DRAWN BY: J.A. | SCALE: 1:1000

REVISED BY:	DATE:	REVISION
R.G.	1 JAN./94	
J.A.	JAN/09/95	YEAR END
JH	JAN/02	YEAR END

790 LEVEL

Contamination Placement
as of December 31, 2003


800-229
229 Stope
229 Slip 4
229 Slip 5
235
800-229 ACC
800 KEX ACC
MCC
FINLAY PORT
MCC
POLARIS MINE
SCALE:1:200
800 LEVEL
Contamination Placement
as of December 31, 2003


MATERIALS PLACED UNDERGROUND
MINE BACKFILL PLACED DURING MINE OPERATIONS
METALS CONTAMINATED SOILS
HYDROCARBON CONTAMINATED SOILS
OTHER WASTE MATERIALS STORAGE
POLARIS MINE
SCALE: 1:500
820 LEVEL
Contamination Placement
as of December 31, 2003
REFUGE STATION
STENCH WARNING STATION
820 ABIN
CV-10
CV-11
820-232
229 stope
820-224
820-226
820-223
820-222
820-220
820-218
820-217
820-215
820-213
820-212
820-210
820-208
820-207
820-205
820-204
820-202
820-200
820-197
820-195
820-194
820-192
820-190
820-187
820-184
AB1
AB3
AB4
AB5
AB6
AB7L
AB8L
AB9L
A3
A4
A5
A6
1600 E
1500 E
1400 E
2400 N
2300 N
2200 N
2100 N
2000 N
1900 N
1800 N

2000 N
1900 N
1800 N
1700 N
1600 E
1500 E
1400 E

850/820–187
850/820–185
850/820–184
825–181
825–152
825–150
825–185
825–176
825–172
C/H FROM 850
CV–11
CV–12

MATERIALS PLACED UNDERGROUND

MINE BACKFILL PLACED DURING MINE OPERATIONS

METALS CONTAMINATED SOILS

HYDROCARBON CONTAMINATED SOILS

OTHER WASTE MATERIALS STORAGE

POLARIS MINE

DRAWN BY: J.A.

REVISED BY:	DATE:	REVISION
JA	FEB/24/94	YEAR END
JA	JAN/16/95	YEAR END
TBU	JUL/97	SEMI-ANNUAL
M. NIXON	JAN/98	YEAR END
TBU	FEB/00	YEAR END
WLB	JAN/01	YEAR END
JH	JAN/02	YEAR END

825 SUBLEVEL
Contamination Placement
as of December 31, 2003

850 NORTH LEVEL

MATERIALS PLACED UNDERGROUND

MINE BACKFILL PLACED DURING MINE OPERATIONS

METALS CONTAMINATED SOILS

HYDROCARBON CONTAMINATED SOILS

OTHER WASTE MATERIALS STORAGE

POLARIS MINE

850 LEVEL SOUTH

Contamination Placement

as of December 31, 2003

Mak Parts
Pump
Compressor
Hydraulic Pack

880–145
880–142
880–141
880–139
880–137
880–135
880 DUMP
135 Stg 1
135 Stg 2
135 Stg 3
125 Stg 3'
125W
680–124W

NP–231
NP–229
NP–227
NP–142
NP–140

880–223
880–220
880–217
880–213
880–210
880–207
880–204
880–200
880–197
880–194
880–190
880–187
880–184
880–181
880–178

AB1
AB2
AB3
AB4
AB5
AB6
AB7
AB8
AB9
AB10
AB11
AB12
AB13
AB14
AB15
AB16
AB17
AB19
AB20

A STOPE
A/B UNDERCUT
B STOPE
B/C UNDERCUT

105–7
105–6

Tires, Steel & Pallets
Tailings Lines

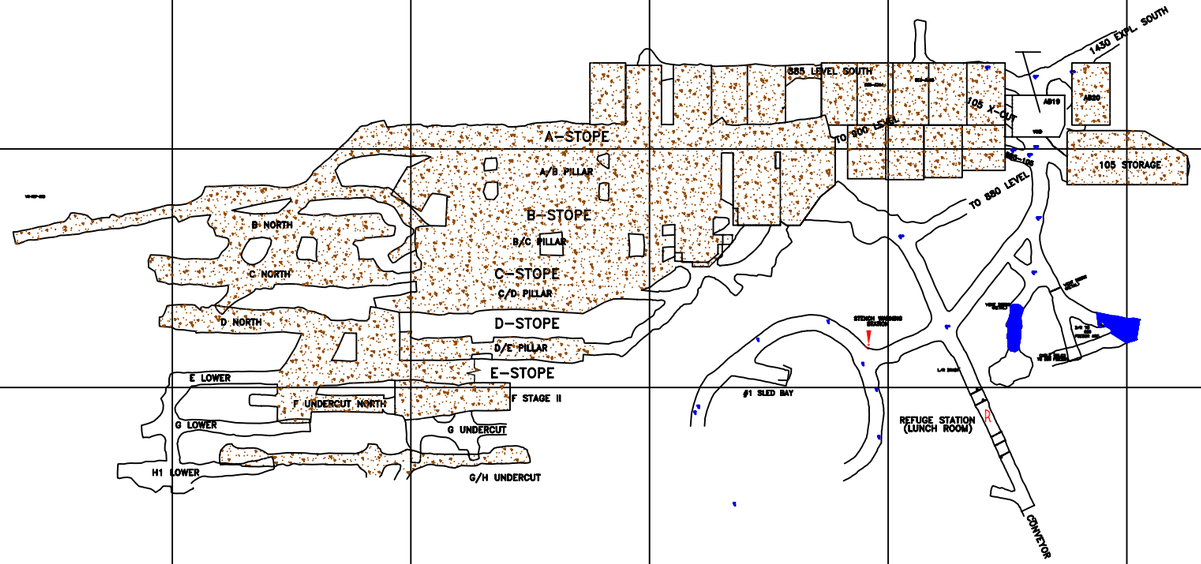
SLED–BAY
LADDER UP TO REFUGE STATION
REFUGE STATION NEXT RIGHT

MATERIALS PLACED UNDERGROUND

MINE BACKFILL PLACED DURING MINE OPERATIONS
METALS CONTAMINATED SOILS
HYDROCARBON CONTAMINATED SOILS
OTHER WASTE MATERIALS STORAGE

POLARIS MINE

880 LEVEL SOUTH
Contamination Placement
as of December 31, 2003



MATERIALS PLACED UNDERGROUND

- MINE BACKFILL PLACED DURING MINE OPERATIONS
- METALS CONTAMINATED SOILS
- HYDROCARBON CONTAMINATED SOILS
- OTHER WASTE MATERIALS STORAGE

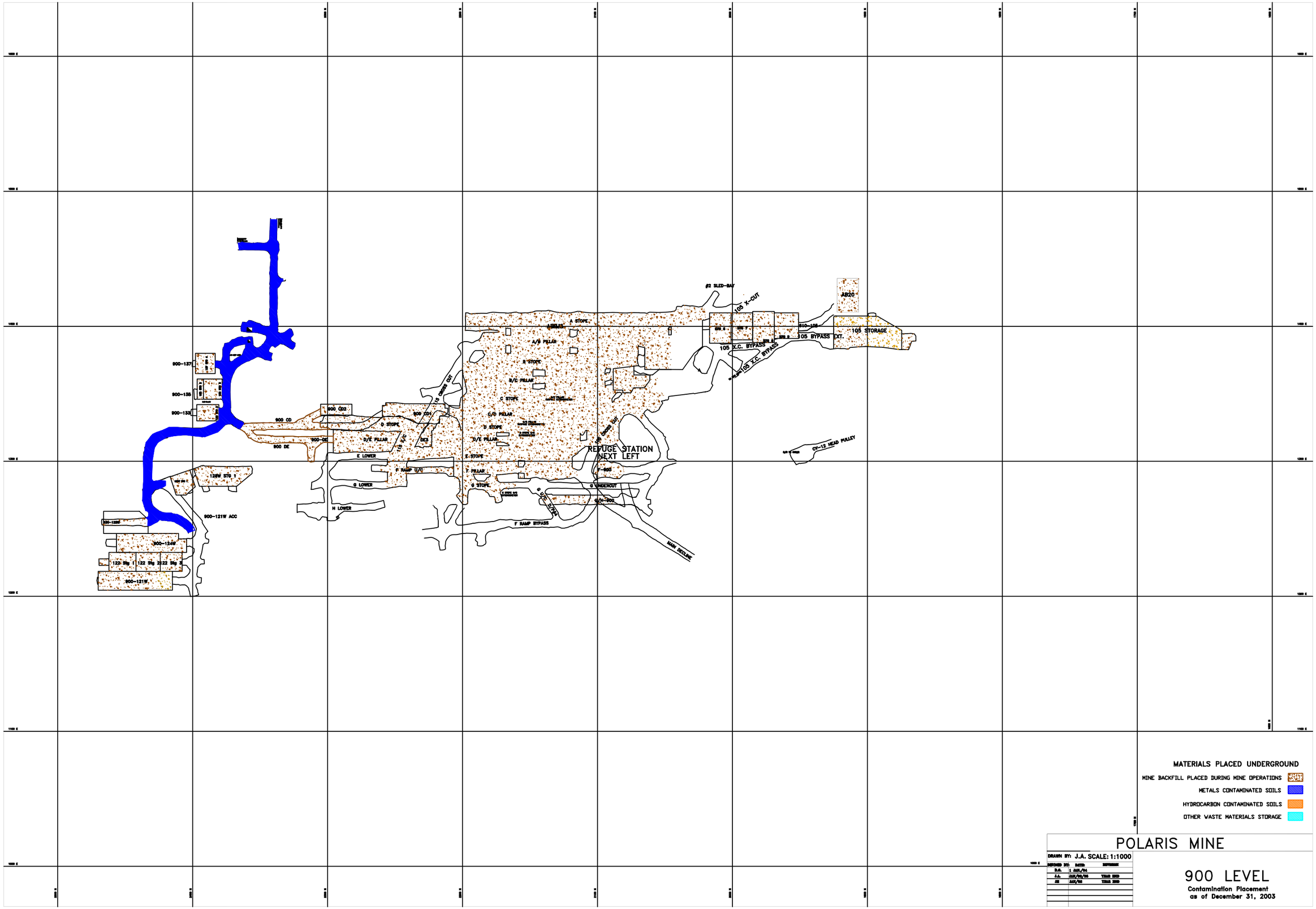
POLARIS MINE

DRAWN BY: J.A. | SCALE:1:1000

REVISED BY:	DATED	REVISION
R.G.	1 JAN./04	
J.A.	JAN./31/05	YEAR END

885 LEVEL

Contamination Placement as of December 31, 2003



MATERIALS PLACED UNDERGROUND

- MINE BACKFILL PLACED DURING MINE OPERATIONS
- METALS CONTAMINATED SOILS
- HYDROCARBON CONTAMINATED SOILS
- OTHER WASTE MATERIALS STORAGE

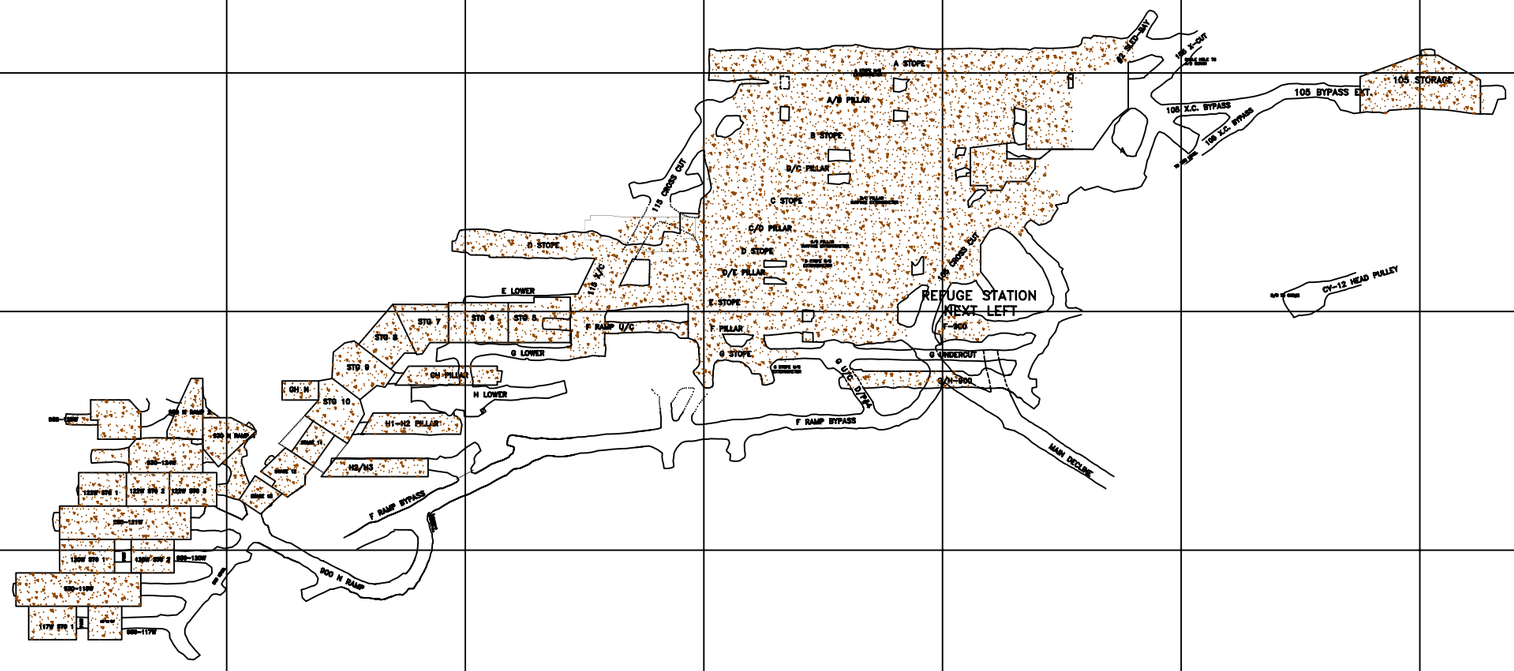
POLARIS MINE

DRAWN BY: J.A. SCALE: 1:1000

REVISED BY	DATED	REFERENCE
D.S.	1 JAN/96	
J.A.	JAN/96/98	YEAR END
JH	JAN/98	YEAR END

900 LEVEL

Contamination Placement
as of December 31, 2003



MATERIALS PLACED UNDERGROUND

MINE BACKFILL PLACED DURING MINE OPERATIONS ▨

METALS CONTAMINATED SOILS ▨

HYDROCARBON CONTAMINATED SOILS ▨

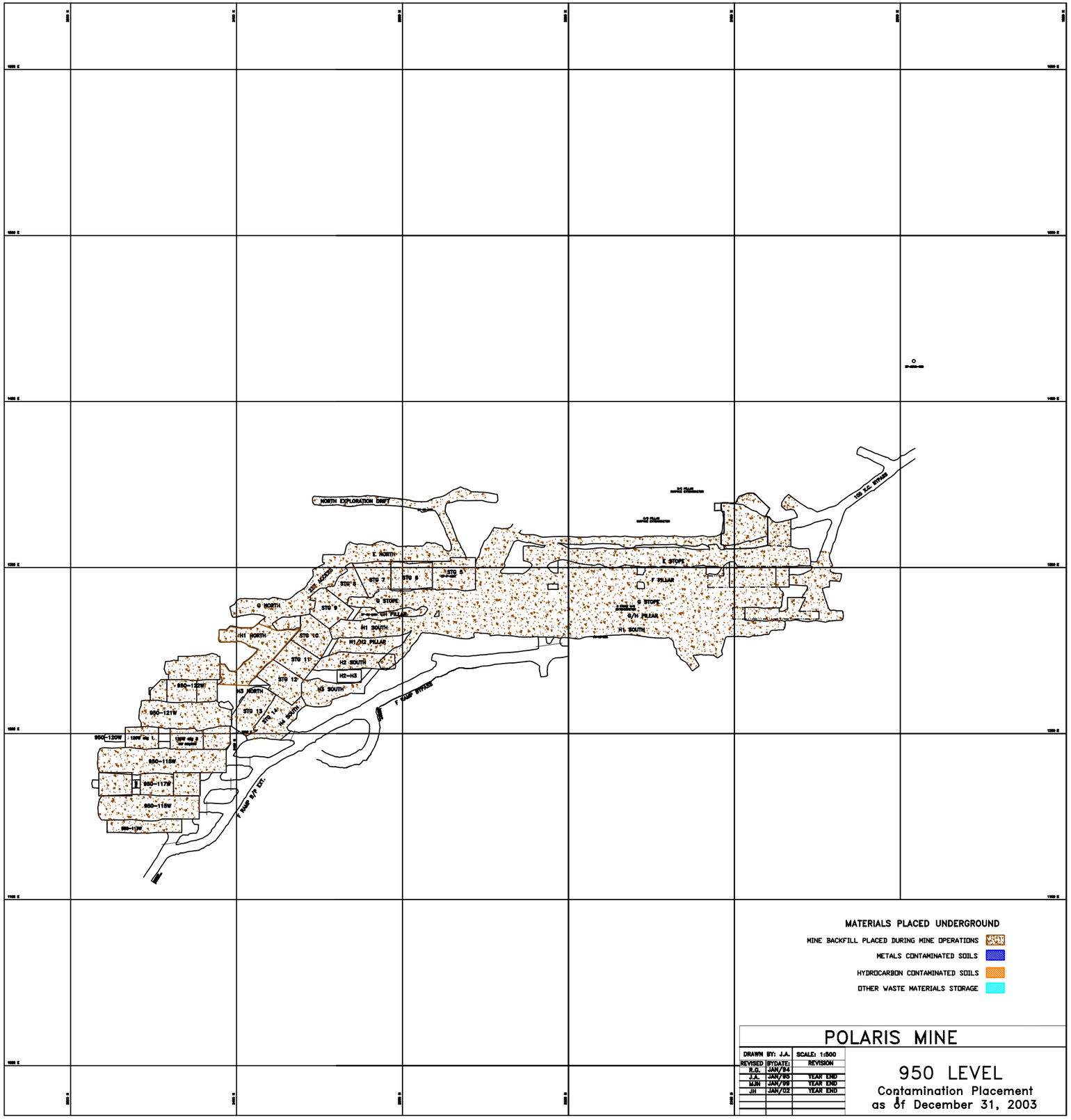
OTHER WASTE MATERIALS STORAGE ▨

POLARIS MINE

DRAWN BY: J.A.

REVISED BY:	DATE:	REVISION
R.G.	1 JAN./94	
J.A.	JAN/00/95	YEAR END
JH	JAN/03	YEAR END

930 LEVEL
Contamination Placement
as of December 31, 2003



MATERIALS PLACED UNDERGROUND

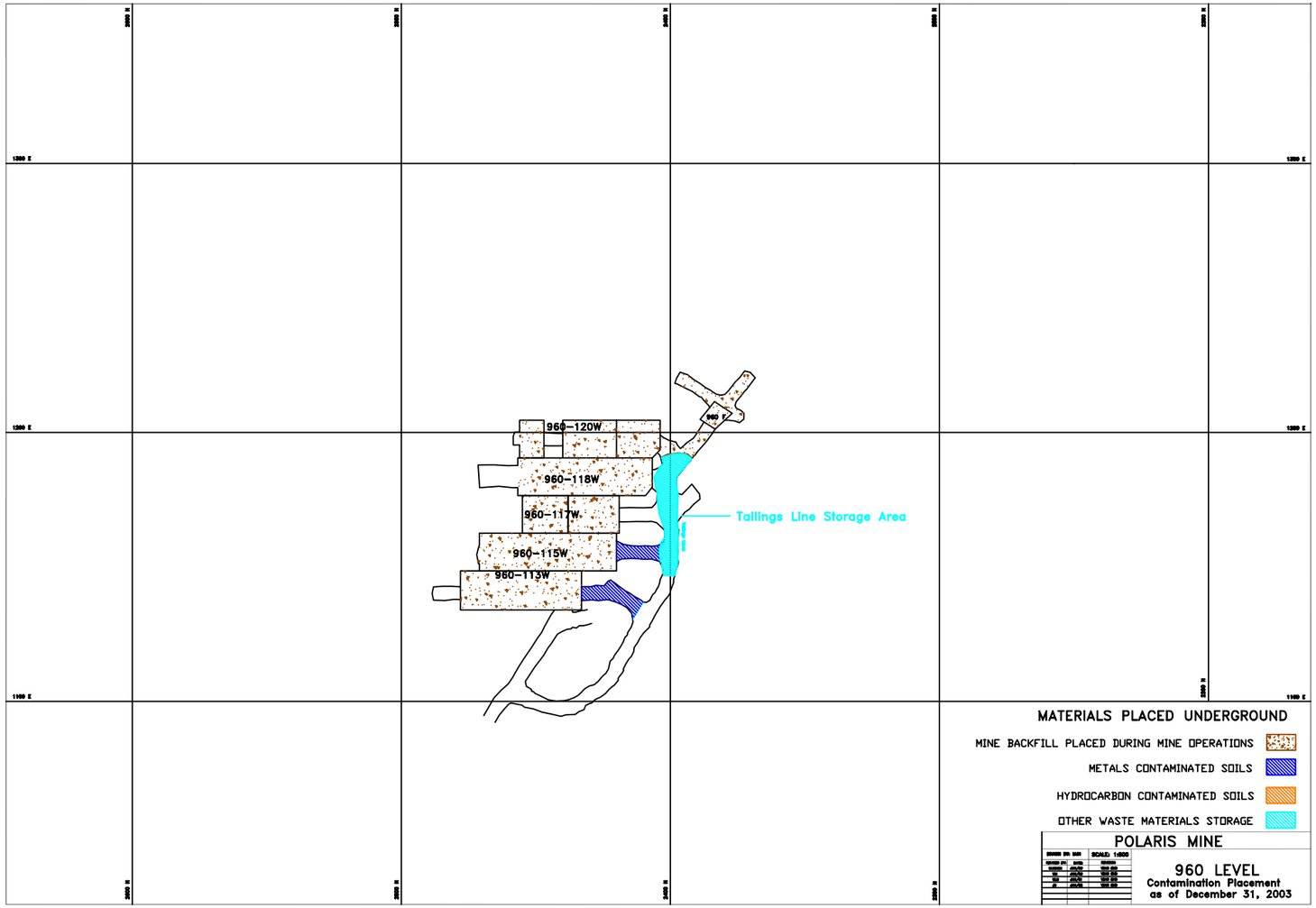
MINE BACKFILL PLACED DURING MINE OPERATIONS	▨
METALS CONTAMINATED SOILS	▨
HYDROCARBON CONTAMINATED SOILS	▨
OTHER WASTE MATERIALS STORAGE	▨

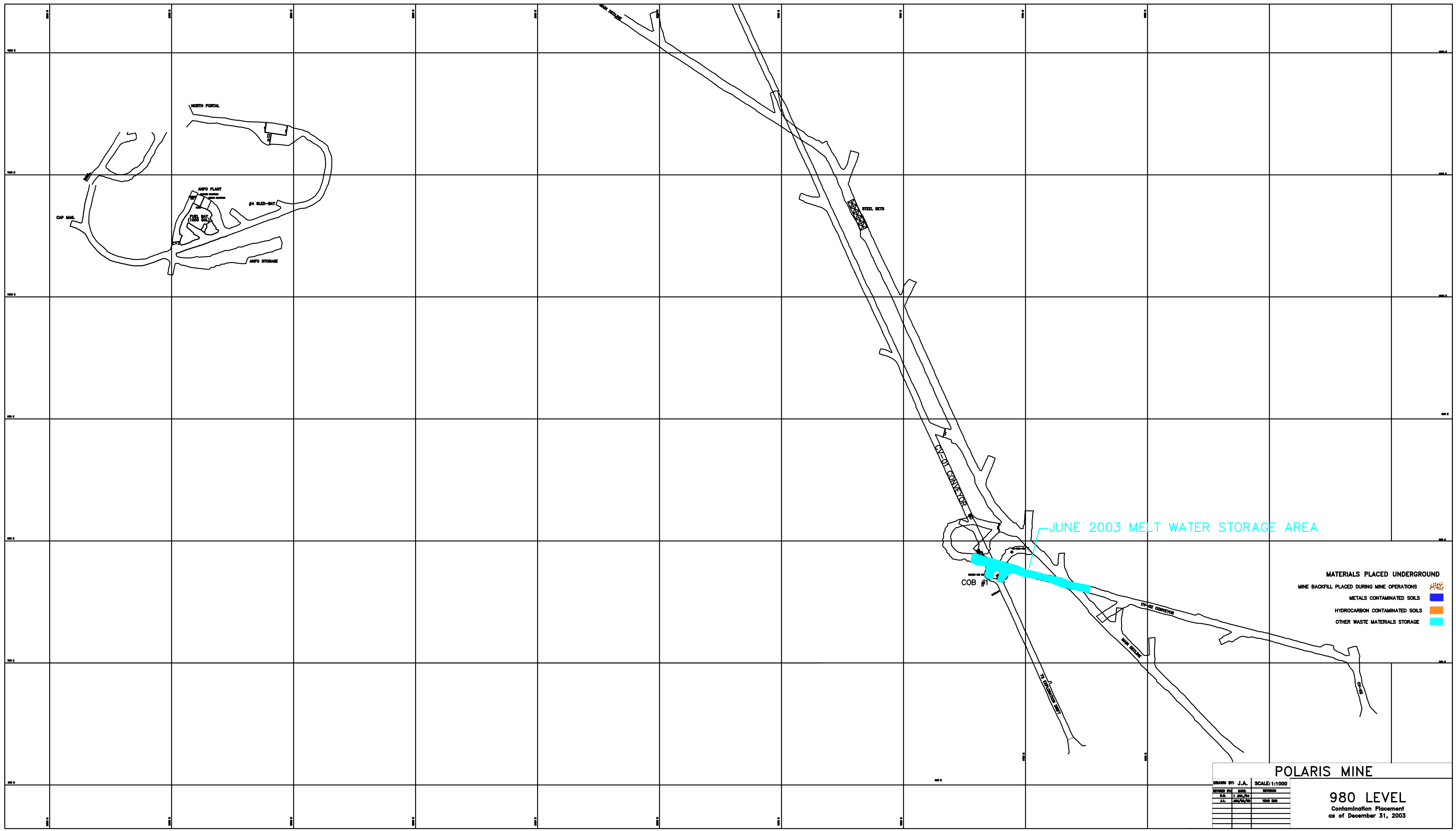
POLARIS MINE

DRAWN BY: J.A.		SCALE: 1:500
REVISED	BYDATE:	REVISION
R.G.	JAN/94	
J.A.	JAN/95	YEAR END
MJN	JAN/99	YEAR END
JH	JAN/02	YEAR END

950 LEVEL

Contamination Placement
as of December 31, 2003


960-120W
960-118W
960-117W
960-115W
960-113W
960 L
Tailings Line Storage Area
MATERIALS PLACED UNDERGROUND
MINE BACKFILL PLACED DURING MINE OPERATIONS
METALS CONTAMINATED SOILS
HYDROCARBON CONTAMINATED SOILS
OTHER WASTE MATERIALS STORAGE
POLARIS MINE
960 LEVEL
Contamination Placement
as of December 31, 2003



NORTH PORTAL
ANFO PLANT
#4 SLED-BAY
FUEL BAY (1000 GAL)
CAP MAG.
ANFO STORAGE
MAIN DECLINE
STEEL SETS
CV-01 CONVEYOR
JUNE 2003 MELT WATER STORAGE AREA
COB #1
CV-02 CONVEYOR
MAIN DECLINE
MATERIALS PLACED UNDERGROUND
MINE BACKFILL PLACED DURING MINE OPERATIONS
METALS CONTAMINATED SOILS
HYDROCARBON CONTAMINATED SOILS
OTHER WASTE MATERIALS STORAGE
POLARIS MINE
DRAWN BY: J.A.
SCALE: 1:1000
980 LEVEL
Contamination Placement
as of December 31, 2003

APPENDIX 7

SUMMARY OF

EFFLUENT MONITORING

AND

EFFLUENT CHARACTERIZATION

Bruce J. Donald
Reclamation Manager

January 26, 2003

Prairie & Northern Region
Environment Canada
Room 200, 4999 98th Ave.
Edmonton, AB T6B 2X3

Attention: Peter Blackall, Regional Director of Environmental Protection

Dear Sir;

Re: Polaris Mine – 2003 4th Quarter Metal Mining Effluent Regulations Report

Despite having a designated discharge location for effluent identified under Section 9 of the MMER, there was no discharge from the Garrow Lake Tailings Impoundment Area during the period October 1, 2003 to December 31, 2003. Only the 3rd Quarter had discharge to report. While there is no data to report other than that there was no effluent discharge, I have completed the monitoring report as required by the regulations and have attached it to this letter.

In preparation of the 4th Quarter report, a review of the information submitted with the 3rd Quarter report identified errors in Schedule 4. The despite reporting the effluent quality, the flow data was omitted. Please find attached a corrected 3rd Quarter report that includes the previously missing flow data.

If you have any questions regarding the quarterly report or aspects of the application of the MMER to the Polaris Mine, please feel free to contact me at any time.

Yours truly,

Bruce Donald

Attachments: (2) - 4th Quarter 2003 Monitoring Report & Revised 3rd Quarter 2003 Monitoring Report

cc:
Walter Kuit (Teck Cominco Limited)
Polaris Mine Site Files
Randy Baker (Azimuth Consulting Group)

POLARIS MINE – MMER MONITORING REPORT

4th QUARTER 2003

APPENDIX A

i. Information specified by Section 8.1 of Reference Method EPS 1/Rm/13

APPENDIX B

i. Information specified by Section 8.1 of Reference Method EPS 1/Rm/14

APPENDIX C

i. Concentration & monthly mean concentrations of each deleterious substance of Schedule 4
ii. pH of the effluents samples as required by subsection 12(1)
iii. Description of sample collection method
iv. Total volume of effluent deposited during each month of the quarter as per section 19
v. Mass loading of the deleterious substances set out in Schedule 4 and as per section 20

APPENDIX D

i. Results of the effluent characterization as per paragraph 15(1)(a)

APPENDIX A

Reporting Requirements for Reference Method EPS 1/RM/13

Section 8.1.1 Effluent

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - No sampling conducted as there was no effluent discharge during the quarter.

iii. Type of sample
   - No sampling conducted as there was no effluent discharge during the quarter

iv. Brief description of sampling point
   - Discharge point of siphon at Garrow Lake dam

v. Sampling method
   - No sampling conducted as there was no effluent discharge during the quarter

vi. Name of person submitting samples
   - No sampling conducted as there was no effluent discharge during the quarter

Section 8.1.2 Test Facilities and Conditions

i. Test type & method
   - No testing conducted as there was no effluent discharge during the quarter

ii. Indications of deviations from requirements in Sections 2 to 7 of Method EPS 1/RM/13
   - No deviations to report as there was no testing conducted during the quarter

iii. Name and city of testing laboratory
   - No laboratory used during the quarter

iv. Percent mortality of fish in stock tank(s)
   - None to report. There were no tests conducted during the period

v. Species of test organism
   - None to report as there were no tests conducted during the period

vi. Date and time for start of definitive test
   - None to report as there were no tests conducted during the period

vii. Person(s) performing the test and verifying the results
   - No tests performed during the quarter

viii. pH, temperature, dissolved oxygen, and conductivity of unadjusted, undiluted effluent
   - No data to report as there were no tests conducted during the period

ix. Confirmation that no adjustment of sample or solution pH occurred
   - No adjustment to report as there were no tests conducted during the period

x. Indication of aeration of test solutions before introduction of fish
   - None to report as there were no tests conducted during the period

xi. Concentrations and volumes tested
   - No data to report as there were no tests conducted during the period

xii. Measurements of dissolved oxygen, pH and temperature
   - No data to report as there were no tests conducted during the period

xiii. Number of fish added to each test vessel
   - No fish added as there were no tests conducted during the period

xiv. Mean and range of fork length of control fish at end of test
   - No data to report as there were no tests conducted during the period

xv. Mean wet weight of individual control fish at end of the test
   - No data to report as there were no tests conducted during the period

xvi. Estimated loading density of fish in test solutions
   - No data to report as there were no tests conducted during the period

Reporting Requirements for Reference Method EPS 1/RM/13 - Continued

Section 8.1.3 Results

i. Number of mortalities of fish in each test solution
   - None to report. No tests conducted during the period

ii. Number of control fish showing atypical/stressed behaviour
   - None to report. No tests conducted.

iii. Mean mortality rate in solutions of effluent and control water
   - None to report. No tests conducted

iv. Estimate of 96-h LC50 in multi-concentration tests
   - No data to report. No tests conducted

v. Most recent 96-h LC50 for reference toxicity test(s)
   - No data to report. No tests conducted

APPENDIX B

Reporting Requirements for Reference Method EPS 1/RM/14

Section 8.1.1 Effluent

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75^{o} 22' 32" N, 97^{o} 48' 37" W.

ii. Date & time of sampling
   - No sampling conducted as there was no effluent discharge during the quarter.

iii. Type of sample
   - No sampling conducted as there was no effluent discharge during the quarter

iv. Brief description of sampling point
   - Discharge point of siphon at Garrow Lake dam

v. Sampling method
   - No sampling conducted as there was no effluent discharge during the quarter

vi. Name of person submitting samples
   - No sampling conducted as there was no effluent discharge during the quarter

Section 8.1.2 Test Facilities and Conditions

i. Test type & method
   - No testing conducted as there was no effluent discharge during the quarter

ii. Indications of deviations from requirements in Sections 2 to 7 of Method EPS 1/RM/13
   - No deviations to report as there was no testing conducted during the quarter

iii. Name and city of testing laboratory
   - No laboratory used during the quarter

iv. Species of test organism
   - None to report as there were no tests conducted during the period

v. Date and time for start of definitive test
   - None to report as there were no tests conducted during the period

vi. Person(s) performing the test and verifying the results
   - No tests performed during the quarter

vii. pH, temperature, dissolved oxygen, and conductivity of unadjusted, undiluted effluent
   - No data to report as there were no tests conducted during the period

viii. Confirmation that no adjustment of sample or solution pH occurred
   - No adjustment to report as there were no tests conducted during the period

ix. Indication of any adjustment of hardness of effluent sample
   - No adjustment to report as there were no tests conducted during the period

x. Indication of any aeration of sample
   - No indication to report as there were no tests conducted during the period

xi. Concentrations and volumes tested
   - No data to report as there were no tests conducted during the period

xii. Measurements of dissolved oxygen, pH and temperature
   - No data to report as there were no tests conducted during the period

xiii. Estimates of time to first brood, average number of neonates per brood, and percent mortality during the seven-day period prior to the test
   - No data to report as there were no tests conducted during the period

xiv. Number of neonates per test vessel and milliliters of solution per daphnid
   - No data to report as there were no tests conducted during the period

Reporting Requirements for Reference Method EPS 1/RM/14 - Continued

Section 8.1.3 Results

i. Number of dead and/or immobile daphnids in each test solution including controls
   - No data to report. No tests conducted during the period.

ii. For single-concentration test the number of daphnids dead in each of three replicate effluent solutions and in each of three replicate control solutions at end of test. Also report the mean value.
   - No data to report. No tests conducted during the period.

iii. Estimate of 48-h LC50 and 95% confidence limits in multi-concentration tests, 48-h EC50 for immobilization and 95% confidence limits, indication of statistical method on which results are based.
   - No data to report. No tests conducted during the period

iv. Most recent 48-h LC50 for reference toxicant test(s), reference chemical(s), date test initiated, historic geometric mean LC50 and warning limits.
   - No data to report. No tests conducted during the period.

APPENDIX C

2003 4th QUARTER MMER REPORT

LOCATION - FINAL DISCHARGE POINT FROM GARROW LAKE (GARROW LAKE DAM SIPHONS)

CONCENTRATIONS OF EFFLUENT FOR MMER SCHEDULE 4 SAMPLED WEEKLY

Sample Taken During The Week of	Date Sample Taken	DELETERIOUS SUBSTANCE (mg/L)[1]								pH[1]	Collection Method
		Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[1]		
06-Oct-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
13-Oct-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
20-Oct-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
27-Oct-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
03-Nov-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
10-Nov-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
17-Nov-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
24-Nov-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
01-Dec-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
08-Dec-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
15-Dec-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
22-Dec-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
29-Dec-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]

Note[1] - All concentrations are in mg/L except Radium 226 which is Bq/L and pH which is in pH units

Note [2] - "na" refers to no effluent discharge to sample

MONTHLY MEAN CONCENTRATIONS OF EFFLUENT FOR MMER SCHEDULE 4

MONTH OF	MONTHLY MEAN CONCENTRATION[1] OF DELETERIOUS SUBSTANCE[3]							
	Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226
July/03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
August/03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
September/03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]

Note[1] - All concentrations are in mg/L except Radium 226 which is Bq/L

Note [2] - "na" refers to no effluent discharge to sample

Note[3] - Monthly Mean Concentrations - the MEAN value of the concentrations measured in all water samples collected during each month when a deleterious substance is deposited.

MASS LOADING OF DELETERIOUS SUBSTANCE FOR EACH DAY SAMPLED

Sample Taken During The Week of	Date Sample Taken	DAILY MASS LOADING OF DELETERIOUS SUBSTANCE (kg/day)[1]								Average Daily Flow Rate (m^3/day)
		Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[1]	
06-Oct-03	na[2]	0	0	0	0	0	0	0	0	0
13-Oct-03	na[2]	0	0	0	0	0	0	0	0	0
20-Oct-03	na[2]	0	0	0	0	0	0	0	0	0
27-Oct-03	na[2]	0	0	0	0	0	0	0	0	0
03-Nov-03	na[2]	0	0	0	0	0	0	0	0	0
10-Nov-03	na[2]	0	0	0	0	0	0	0	0	0
17-Nov-03	na[2]	0	0	0	0	0	0	0	0	0
24-Nov-03	na[2]	0	0	0	0	0	0	0	0	0
01-Dec-03	na[2]	0	0	0	0	0	0	0	0	0
08-Dec-03	na[2]	0	0	0	0	0	0	0	0	0
15-Dec-03	na[2]	0	0	0	0	0	0	0	0	0
22-Dec-03	na[2]	0	0	0	0	0	0	0	0	0
29-Dec-03	na[2]	0	0	0	0	0	0	0	0	0

Note[1] - Mass Loading is in kilograms per day of the deleterious substance deposited except Radium 226 which is in Bq per day

Note[2] - "na" refers to no effluent discharge to sample

MASS LOADING PER CALENDAR MONTH FOR EACH DELETERIOUS SUBSTANCE

CALENDAR MONTH OF	MASS LOADING[1] FOR DELETERIOUS SUBSTANCE (kg/month)[2]								Average Weekly Flow Rate[3] (m^3/week)	Total Monthly Volume[4] (m^3/month)
	Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[2]		
October/03	0	0	0	0	0	0	0	0	0	0
November/03	0	0	0	0	0	0	0	0	0	0
December/03	0	0	0	0	0	0	0	0	0	0

Note[1] - Total Mass Loading for Calendar month calculated by multiplying the Average Daily Mass Loading for the Month x # days in the month

Note[2] - Mass loading units are in kg per month except Radium 226, which is in Bq permonth

Note[3] - Average Weekly Flow Rate calculated by multiplying Average Daily Flow Rate x 7 days per week

Note[4] - Total Monthly Volume calculated by multiplying Average Daily Flow Rate for the month x days in month

APPENDIX D

RESULTS OF EFFLUENT CHARACTERIZATION

AS PER PARAGRAPH 15(1)(a)

No effluent samples were collected during the 4th Quarter of 2003 as there was no effluent discharge.
No Acute Lethality Testing conducted during the quarter as there was no effluent being discharged.

POLARIS MINE – MMER MONITORING REPORT

REVISED 3rd QUARTER 2003

APPENDIX A

i. Information specified by Section 8.1 of Reference Method EPS 1/Rm/13: 96 hr acute rainbow trout test

APPENDIX B

i. Information specified by Section 8.1 of Reference Method EPS 1/Rm/14: 72 hr acute *Daphnia magna* test

APPENDIX C

i. Information specified in Schedule 5 of the MMER (June 2002) for Reference Method EPAW 95-EPA West Coast: 7-day Topsmelt Survival and Growth Test.

APPENDIX D

i. Information specified in Schedule 5 of the MMER (June 2002) for Reference Method EPS 1/Rm/27-EC: 92 hr Echinoderm (sand dollar) Fertilization Test (Annual)

APPENDIX E

i. Information specified in Schedule 5 of the MMER (June 2002) for Reference Method EPA/600/4-91-003, Method 1009.0: Algae (*Champia parvula*) 7-day Sublethal Growth Test (Annual).

APPENDIX F (Mass Loadings)

i. Concentration & monthly mean concentrations of each deleterious substance of Schedule 4
ii. pH of the effluents samples as required by subsection 12(1)
iii. Description of sample collection method
iv. Total volume of effluent deposited during each month of the quarter as per section 19
v. Mass loading of the deleterious substances set out in Schedule 4 and as per section 20

APPENDIX G

i. Results of the effluent characterization as per paragraph 15(1)(a)

APPENDIX A

96-h Acute Rainbow Trout Toxicity Test

Reporting Requirements for Reference Method EPS 1/RM/13

Section 8.1.1 Effluent

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for monthly acute toxicity testing were collected
   - Test 1: Wednesday July 30, 2003 - 1:00 PM
   - Test 2: Wednesday August 20, 2003 - 12:30 AM
   - Test 3: Tuesday September 16, 2003 - 5:00 PM

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 2 x 20L sample bottles were filled

vi. Name of person submitting samples
   - Dennis Lu (Gartner Lee)

Section 8.1.2 Test Facilities and Conditions

i. Test type & method
   - 96-hour Rainbow Trout LC_{50}

ii. Indications of deviations from requirements in Sections 2 to 7 of Method EPS 1/RM/13
   - No deviations from requirements
   - Salinity controls were run
   - Sample water salinity was 2ppt (Test 1); 4ppt (Test 2), and 6ppt (Test 3)

iii. Name and city of testing laboratory
   - EVS Environment Consultants, North Vancouver, BC

iv. Percent mortality of fish in stock tank(s)
   - Test 1: 0.1%
   - Test 2: 0.1%
   - Test 3: 1%

v. Species of test organism
   - Rainbow Trout (*Oncorhynchus mykiss*)

vi. Date and time for start of definitive test
   - Test 1: Saturday August 2, 2003 - 2:00 PM
   - Test 2: Friday August 22, 2003 - 12:30 PM
   - Test 3: Friday September 19, 2003 - 5:00 PM

vii. Person(s) performing the test and verifying the results
   - Andy Diewald, Devika Jayaweera, May Lee

viii. pH, temperature, dissolved oxygen, and conductivity of unadjusted, undiluted effluent
   - Test 1: pH - 7.8, T - 15.0°C, DO - 10.0mg/L, C - 4100µmhos/cm
   - Test 2: pH - 7.8, T - 15.0°C, DO - 10.1mg/L, C - 6000µmhos/cm
   - Test 3: pH - 8.1, T - 16.0°C, DO - 10.0mg/L, C - 8000µmhos/cm

Reporting Requirements for Reference Method EPS 1/RM/13

ix. Confirmation that no adjustment of sample or solution pH occurred
- Test 1: No pH adjustment
- Test 2: No pH adjustment
- Test 3: No pH adjustment

x. Indication of aeration of test solutions before introduction of fish
- Test 1: 6.5 ± 1 mL/min/L for 60mins
- Test 2: 6.5 ± 1 mL/min/L for 90mins
- Test 3: 6.5 ± 1 mL/min/L for 120mins

xi. Concentrations and volumes tested
- Concentrations (% effluent volume / total volume) tested and total volumes used were:
- Control (0%) - 12 L (test 1&2), 15 L (test 3)
- 6.25% - 12 L (test 1&2), 15 L (test 3)
- 12.5% - 12 L (test 1&2), 15 L (test 3)
- 25% - 12 L (test 1&2), 15 L (test 3)
- 50% - 12 L (test 1&2), 15 L (test 3)
- 100% - 12 L (test 1&2), 15 L (test 3)
- Salinity Control - 12 L (test 1&2), 15 L (test 3)

xii. Measurements of dissolved oxygen, pH and temperature
- Test 1: DO: 8.2 - 10.1 mg/L, pH: 7.0 - 7.8, T: 15.0 °C
- Test 2: DO: 8.2 - 10.1 mg/L, pH: 7.1 - 7.8, T: 15.0 °C
- Test 3: DO: 8.2 - 10.0 mg/L, pH: 6.6 - 8.1, T: 15.0 - 16.0 °C

xiii. Number of fish added to each test vessel
- 10 fish/ vessel

xiv. Mean and range of fork length of control fish at end of test
- Test 1: 42mm (40-44)
- Test 2: 38mm (35-42)
- Test 3: 36mm (32-40)

xv. Mean wet weight of individual control fish at end of the test
- Test 1: 0.57g (0.43-0.68)
- Test 2: 0.59g (0.43-0.72)
- Test 3: 0.50g (0.35-0.61)

xvi. Estimated loading density of fish in test solutions
- Test 1: 0.48g/L
- Test 2: 0.49g/L
- Test 3: 0.33g/L

Section 8.1.3 Results

i. Number of mortalities of fish in each test solution
- Results were the same for Test 1, Test 2, and Test 3, except where noted
- Control (0%) - 0
- 6.25% - 0
- 12.5% - 0
- 25% - 0
- 50% - 0 (test 1&2), 1 (test 3)
- 100% - 0
- Salinity Control - 0

Reporting Requirements for Reference Method EPS 1/RM/13

ii. Number of control fish showing atypical/stressed behaviour
- None in Test 1, Test 2, or Test 3

iii. Mean mortality rate in solutions of effluent and control water
- Results were the same for Test 1, Test 2, and Test 3, except where noted
- Control (0%) - 0%
- 6.25% - 0%
- 12.5% - 0%
- 25% - 0%
- 50% - 0% (test 1&2), 10% (test 3)
- 100% - 0%
- Salinity Control - 0%

iv. Estimate of 96-h LC50 in multi-concentration tests
- Results were the same for Test 1, Test 2, and Test 3
- 96hr LC_{50} concentration > 100% effluent

v. Most recent 96-h LC50 for reference toxicity test(s)
- Reference toxicity tests for Toxicant: SDS
- Test 1: (Jul-10-03) 96-h LC_{50} = 36mg/L SDS, 95% CL = 30-42mg/L
- Test 2: (Aug-5-03) 96-h LC_{50} = 24mg/L SDS, 95% CL = 18-32mg/L
- Test 3: (Sep-3-03) 96-h LC_{50} = 24mg/L SDS, 95% CL = 22-26mg/L

APPENDIX B

72-h Acute *Daphnia magna* Toxicity Test

Reporting Requirements for Reference Method EPS 1/RM/14

Section 8.1.1 Effluent

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for monthly acute toxicity testing were collected
   - Test 1: Wednesday July 30, 2003 - 1:00 PM
   - Test 2: Wednesday August 20, 2003 - 12:30 AM
   - Test 3: Tuesday September 16, 2003 - 5:00 PM

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 2 x 20L sample bottles were filled

vi. Name of person submitting samples
   - Dennis Lu (Gartner Lee)

Section 8.1.2 Test Facilities and Conditions

i. Test type & method
   - 48-hour *Daphnia magna* LC_{50}

ii. Indications of deviations from requirements in Sections 2 to 7 of Method EPS 1/RM/13
   - No deviations from requirements
   - Salinity controls were run
   - Sample water salinity was 2ppt (Test 1); 4ppt (Test 2), and 6ppt (Test 3)

iii. Name and city of testing laboratory
   - EVS Environment Consultants, North Vancouver, BC

iv. Species of test organism
   - *Daphnia magna*

v. Date and time for start of definitive test
   - Test 1: Saturday August 2, 2003 - 2:00 PM
   - Test 2: Friday August 22, 2003 - 3:30 PM
   - Test 3: Friday September 19, 2003 - 3:15 PM

vi. Person(s) performing the test and verifying the results
   - Andy Diewald and May Lee

vii. pH, temperature, dissolved oxygen, and conductivity of unadjusted, undiluted effluent
   - Test 1: pH - 7.5, T - 21.0°C, DO - 8.7mg/L, C - 4100µmhos/cm
   - Test 2: pH - 7.8, T - 20.0°C, DO - 8.9mg/L, C - 9280µmhos/cm
   - Test 3: pH - 8.0, T - 19.5°C, DO - 8.7mg/L, C - 11330µmhos/cm

viii. Confirmation that no adjustment of sample or solution pH occurred
   - Test 1: No pH adjustment
   - Test 2: No pH adjustment
   - Test 3: No pH adjustment

Reporting Requirements for Reference Method EPS 1/RM/14

ix. Indication of any adjustment of hardness of effluent sample
- Test 1: No hardness adjustment
- Test 2: No hardness adjustment
- Test 3: No hardness adjustment

x. Indication of any aeration of sample
- Test 1: No pre-aeration adjustment
- Test 2: No pre-aeration adjustment
- Test 3: 25-50 mL/min/L for 10mins

xi. Concentrations and volumes tested
- Concentrations (% effluent volume / total volume) tested and total volumes used were:
- Control (0%) - 200 mL
- 6.25% - 200 mL
- 12.5% - 200 mL
- 25% - 200 mL
- 50% - 200 mL
- 100% - 200 mL
- Salinity Control - 200 mL

xii. Measurements of dissolved oxygen, pH and temperature
- Test 1: DO: 8.3 - 8.7 mg/L, pH: 7.5 - 7.9, T: 20.0 - 21.0 °C
- Test 2: DO: 8.4 - 9.0 mg/L, pH: 7.6 - 8.1, T: 20.0 - 20.5 °C
- Test 3: DO: 8.3 - 9.1 mg/L, pH: 7.6 - 8.1, T: 19.5 - 21.0 °C

xiii. Estimates of time to first brood, average number of neonates per brood, and percent mortality during the seven-day period prior to the test
- Test 1: 9 days to brood, >15 neonates/brood, 4.6% mortality in 7d prior to test
- Test 2: 9 days to brood, >19.9 neonates/brood, 10.0% mortality in 7d prior to test
- Test 3: 8 days to brood, >26.3 neonates/brood, 5.5% mortality in 7d prior to test

xiv. Number of neonates per test vessel and milliliters of solution per daphnid
- Methods for all tests and dilution series were the same:
- 10 neonates per vessel
- 200 mL of solution per daphnid

Section 8.1.3 Results

i. Number of dead and/or immobile daphnids in each test solution including controls
- Results were the same for Test 1, Test 2, and Test 3, except where noted
- Control (0%) - 0 dead / immobile (test 1&2), 1 dead (test 3)
- 6.25% - 0 dead / immobile
- 12.5% - 0 dead / immobile
- 25% - 0 dead / immobile
- 50% - 0 dead / immobile
- 100% - 0 dead / immobile (test 1&2), 1 dead (test 3)
- Salinity Control - 0 dead / immobile

ii. For single-concentration test the number of daphnids dead in each of three replicate effluent solutions and in each of three replicate control solutions at end of test. Also report the mean value.
- Single concentration test was not conducted, dilution series tests were conducted

Reporting Requirements for Reference Method EPS 1/RM/14

iii. Estimate of 48-h LC50 and 95% confidence limits in multi-concentration tests, 48-h EC50 for immobilization and 95% confidence limits, indication of statistical method on which results are based.
- Test 1: 48-h LC_{50} = > 100% effluent
- Test 2: 48-h LC_{50} = > 100% effluent
- Test 3: 48-h LC_{50} = > 100% effluent

iv. Most recent 48-h LC50 for reference toxicant test(s), reference chemical(s), date test initiated, historic geometric mean LC50 and warning limits.
- Reference toxicity tests for Toxicant: Zinc
- Test 1: (Aug-7-03) 96-h LC_{50} = 453µg/L Zinc, 95% CL = 377-544µg/L
- Test 2: (Aug-7-03) 96-h LC_{50} = 453µg/L Zinc, 95% CL = 377-544µg/L
- Test 3: (Sep-23-03) 96-h LC_{50} = 429µg/L Zinc, 95% CL = 355-518µg/L

APPENDIX C

7-d Topsmelt Growth and Survival Toxicity Test

Reporting Requirements for Reference Method EPA/600/R-95/136

Effluent Sample

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for yearly sublethal toxicity testing were collected:
     Wednesday August 20, 2003 - 12:30 AM

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 4 x 20L sample bottles were filled

vi. Name of person submitting samples
   - Dennis Lu (Gartner Lee)

Test Organisms Imported from External Supplier

i. Species of test organism
   - Topsmelt (*Atherinops affinis*)

ii. Name and city of testing laboratory
   - EVS Environment Consultants, North Vancouver, BC

iii. Source of test species
   - Aquatic Bio Systems (ABS), Fort Collins, Colorado

iv. Date test species acquired on
   - August 21, 2003

v. Indications of deviations from EC guidance on the importation of test organisms
   - No deviations from EC requirements

vi. Percent mortality of fish in 24-hour period preceding the test
   - <10% mortality

vii. Age at start of test
   - 10 days post-hatch

viii. Unusual appearance, behaviour, or treatment of larvae before their use in the test
   - Nothing unusual, no excessive crowding of larvae, larvae appear healthy, disease-free, stress free,

ix. Confirmation that larvae are actively feeding and swimbladders are not inflated
   - Larvae actively feeding and swimbladders not inflated

x. Confirmation that temperature change was <3°C and dissolved oxygen was maintained at >6mg/L during transport
   - Temperature change was <2°C and dissolved oxygen supersaturated mg/L during transport

xi. Test organism acclimation rate at the testing laboratory
   - Holding water conditions upon arrival were DO=supersaturated, pH=7.3, T=22°C
   - Organisms were acclimated slowly overnight
   - Addition of EVS lab seawater at intervals of 30 – 60min to reach acceptable conditions
   - Organisms were acclimated to DO=8mg/L, salinity=28ppt,T=20°C

Reporting Requirements for Reference Method EPA/600/R-95/136

Test Facilities and Conditions

i. Test type & method
   - 7-day Topsmelt (*Atherinops affinis*) Survival and Growth Toxicity Test
   - Static renewal
   - Sample water was renewed daily
   - Reference Method - EPA/600/R-95/136 (EPAW 95-EPA West Coast)

ii. Indications of deviations from requirements in Sections 11 of Method EPA/600/R-95/136 (EPAW 95-EPA West Coast)
   - No deviations from requirements
   - Salinity controls were run
   - Sample water salinity was 5.3ppt

iii. Date and time for start of definitive test
   - Friday August 22, 2003 - 5:00 PM

iv. Test vessel description
   - 600mL beaker

v. Person(s) performing the test and verifying the results
   - Kevin Goodearle, Julianna Kalocai, Sioe Lie Kwee, Rachel DeWynter, Edmund Canaria, and Armando Tang

vi. pH, temperature, dissolved oxygen, and conductivity of unadjusted, undiluted effluent
   - pH - 7.9, T - 20.0°C, DO - 11.0mg/L, C - 9570µmhos/cm, (salinity - 5.3 ppt)

vii. Confirmation that no adjustment of sample or solution pH occurred
   - No pH adjustment

viii. Indication of aeration of test solutions before introduction of fish
   - Pre-aeration at 6.5mL/min/L for 30mins due to supersaturation of sample with O_2 when sample was heated to 20°C
   - DO was reduced from 11.0mg/L to 7.8 mg/L

ix. Indication that EC guidance document for salinity adjustment was followed
   - No deviations from EC guidance document on preparation of hypersaline brine
   - HSB prepared from natural seawater concentrated to 90ppt (by freezing/refreezing to remove frozen layer and concentrate salts)
   - No deviations from EC guidance document for salinity adjustment of sample
   - HSB was added to samples to salinity adjust them from 5.3ppt to 30ppt

x. Type and source of control/dilution water
   - UV-sterilized, 0.45µm-filtered natural seawater from the Vancouver Aquarium

xi. Concentrations and volumes tested
   - Concentrations (% effluent volume / total volume) tested and total volumes used were:
   - Control (0%) - 200 mL
   - Salinity Control (0%) - 200 mL
   - 4.5% - 200mL
   - 9.0% - 200mL
   - 18.1% - 200mL
   - 36.2% - 200mL
   - 72.3% - 200mL

xii. Number of replicated per concentration
   - 5 replicates per concentration

xiii. Number of organisms added to each test vessel
   - 5 fish per vessel

xiv. Manner and rate of exchange of test solutions
   - Daily renewal

Reporting Requirements for Reference Method EPA/600/R-95/136

xv. Measurements of dissolved oxygen, pH and temperature
- DO: 6.6 - 7.8 mg/L, pH: 7.7 - 8.2, T: 19.0 - 20.0 °C, salinity: 29 - 31 ppt

Results

i. Number and % of mortalities of fish in each test solution
- Totals from all 5 replicates are presented:
- Control (0%) - 1/25 = 4%
- Salinity Control - 0/25 = 0%
- 4.5% - 0/25 = 0%
- 9.0% - 0/25 = 0%
- 18.1% - 0/25 = 0%
- 36.2% - 0/25 = 0%
- 72.3% - 1/25 = 4%

ii. Average dry weight per original fish in test vessel
- Means from all 5 replicates are presented:
- Control (0%) - 1.18 mg
- Salinity Control - 1.14 mg
- 4.5% - 1.13 mg
- 9.0% - 1.32 mg
- 18.1% - 1.09 mg
- 36.2% - 1.11 mg
- 72.3% - 1.14 mg

iii. Estimate of 7-d LC_{50} (95% CL)
- 7-d LC_{50} concentration > 72.3% effluent (highest concentration tested due to dilution for salinity adjustment)
- Quantal statistic methods not applicable

iv. Estimate of 7-d IC_{25} (95% CL) for growth
- 7-d IC_{25} concentration > 72.3% effluent (highest concentration tested due to dilution for salinity adjustment)
- Quantal statistic methods not applicable

v. Current reference toxicity tests (95% CL) for 7-d LC_{50} for survival and 7-d IC_{50} for growth
- Reference toxicity tests for Toxicant: Copper
- Test conducted on August 22, 2003, same day as effluent test
- Reference toxicant test was conducted on the same batch of externally supplied topsmelt used in the effluent test and under the same experimental conditions as the effluent test
- 7-d LC_{50} survival = 122mg/L Cu, 95% CL = 111-135mg/L
- 7-d IC_{50} growth = 122mg/L Cu, 95% CL = 106-132mg/L

vi. Reference toxicity warning limits (+/- SD) for 7-d LC_{50} for survival and 7-d IC_{50} for growth
- Reference toxicity tests for Toxicant: Copper
- 7-d LC_{50} survival = 139 ± 63mg/L Cu,
- 7-d IC_{50} growth = 136 ± 52mg/L Cu

APPENDIX D

92-h Echinoderm Fertilization Test

Reporting Requirements for Reference Method EPS1/RM/27-EC 92 (Sperm Cell)

Effluent Sample

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for yearly sublethal toxicity testing were collected:
     Wednesday August 20, 2003 - 12:30 AM

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 4 x 20L sample bottles were filled

vi. Name of person submitting samples
   - Dennis Lu (Gartner Lee)

Test Organisms

i. Species of test organism
   - Sandollar Echinoid (*Dendraster excentricus*)

ii. Name and city of testing laboratory
   - EVS Environment Consultants, North Vancouver, BC

iii. Source of test species
   - M-REP, Escondido, California
   - All adults providing gametes are from the same population and source
   - Gametes are spawned in-house at EVS

iv. Date test species acquired on
   - August 22, 2003

v. Holding time and conditions for adults
   - Adults received at the testing laboratory the day of the test, shipped overnight

vi. Indications of deviations from EC guidance on the importation of test organisms
   - No deviations from EC requirements

vii. Weekly percent mortality of adults being held over 7d preceding test
   - <2% per day over the 7 days preceding the test

viii. Age of test organisms
   - < 4 hours after spawning

ix. Unusual appearance, behaviour, or treatment of adults or gametes before test start
   - Organisms appear healthy

Test Facilities and Conditions

i. Test type & method
   - Echinoderm (*Dendraster excentricus*) Fertilization Toxicity Test
   - Static
   - Reference Method – EPS/1/RM/27 with 1997 amendments

ii. Test duration
   - 10:10 min (10min sperm + 10min sperm & egg)

iii. Date and time for start of definitive test

Reporting Requirements for Reference Method EPS1/RM/27-EC 92 (Sperm Cell)

- Friday August 22, 2003 - 5:00 PM

iv. Test vessel description
- 16 x 125mm test tubes

v. Person(s) performing the test and verifying the results
- Kevin Goodearle, Julianna Kalocai, Sioe Lie Kwee, Rachel DeWynter, Edmund Canaria, and Armando Tang

vi. Indication of rate and duration of pre-aeration of test solutions before initiation of test
- No pre-aeration

vii. Confirmation that no adjustment of sample or solution pH occurred
- No pH adjustment

viii. Procedure for sample filtration
- No sample filtration

ix. Procedure for preparation of hypersaline brine (HSB) as per EC guidance document on salinity adjustment – July 1997
- No deviations from EC guidance for salinity adjustment

x. Procedure for salinity adjustment as per EC guidance document on salinity adjustment – July 1997
- No deviations from EC guidance for salinity adjustment
- Salinity adjusted from 5ppt to 29ppt

xi. Type and source of control/dilution water
- UV-sterilized, 0.45µm-filtered natural seawater from the Vancouver Aquarium

xii. Concentrations and volumes tested
- Concentrations (% effluent volume / total volume) tested and total volumes used were:
- Control (0%) - 10mL
- Salinity Control (0%) - 10mL
- 4.6% - 10mL
- 9.1% - 10mL
- 18.2% - 10mL
- 36.5% - 10mL
- 73.0% - 10mL

xiii. Number of replicated per concentration
- 4 replicates per treatment concentration

xiv. Number of organisms per container
- 2000 eggs per 10mL vessel

xv. Measurements of pH and dissolved oxygen in sample water before use
- pH - 8.3, DO - 8.4mg/L

xvi. Measurements of pH, temperature, dissolved oxygen, and salinity during test
- pH - 7.9-8.4, T - 15.0-15.5°C, DO - 8.1-8.4mg/L, salinity - 29ppt

Results

i. Number and % of fertilized eggs in each test concentration
- (Number is equal to percent since totals were 100)
- Control (0%): #F = 51, 50, 52, 54 #UF = 49, 50, 49, 46
- Salinity Control: #F = 51, 52, 50, 51 #UF = 49, 48, 50, 49
- 4.6%: #F = 35, 40, 29, 45 #UF = 65, 60, 71, 55
- 9.1%: #F = 36, 28, 33, 25 #UF = 64, 72, 67, 75
- 18.2%: #F = 22, 24, 18, 20 #UF = 78, 78, 82, 80
- 36.5%: #F = 12, 8, 7, 10 #UF = 88, 92, 93, 90
- 73.0%: #F = 1, 0, 2, 0 #UF = 99, 100, 98, 100

Reporting Requirements for Reference Method EPS1/RM/27-EC 92 (Sperm Cell)

ii. Estimate of IC_{25} (95% CL) for fertilization success
- IC_{25} concentration = 3.8 (1.1 - 7.2)% v/v effluent
- Quantal statistic method = log linear interpolation

iii. Current reference toxicity tests (95% CL) for IC_{50} for fertilization
- Reference toxicity tests for Toxicant: Sodium Dodecyl Sulfate
- Test conducted on August 22, 2003, same day as effluent test
- Reference test conducted under same conditions
- IC_{50} for fertilization = 1.3mg/L SDS, 95% CL = 1.1-1.5mg/L

APPENDIX E

7-d Sublethal *Champia* (Algae) Toxicity Test

Reporting Requirements for Reference Method EPA/600/4-91/003 Method 1009.0

Effluent Sample

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for yearly sublethal toxicity testing were collected:
     Wednesday August 20, 2003 - 12:30 AM

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 1 x 4L sample bottles were filled

vi. Name of person submitting samples
   - Dennis Lu (Gartner Lee)

vii. Temperature of water upon receipt at lab
   - 13°C

Test Organisms

i. Species of test organism
   - Algae (*Champia parvula*)

ii. Name and city of testing laboratory
   - Saskatchewan Research Council [SRC], Saskatoon, SK

iii. Source of test species
   - Sexually mature male and female branches
   - Obtained from USEPA, Hatfield Marine Science Center, Newport Oregon, 1995
   - Appear in good health
   - Females have trichogynes, males have sori with spermatia

Test Facilities and Conditions

i. Test type & method
   - *Champia parvula* sexual reproduction test
   - Static, non-renewal
   - 2-day exposure, followed by 5-7 day recovery period for cystocarp development
   - Reference Method - EPA/600/4-91/003, Method 1009.0

ii. Date and time for start of definitive test
   - Friday August 22, 2003 – 10:00 AM

iii. Test vessel description
   - 270mL transparent polystyrene cups with polystyrene lids

iv. Person(s) performing the test and verifying the results
   - Mary Moody

v. Indication of pre-aeration of test solutions
   - No pre-aeration

vi. Confirmation that no pH adjustment of sample or solution occurred
   - No pH adjustment

Reporting Requirements for Reference Method EPA/600/4-91/003 Method 1009.0

vii. Indication that EC guidance document for salinity adjustment was followed
- No deviations from EC guidance document on preparation of hypersaline brine
- HSB prepared from natural seawater at 90ppt
- No deviations from EC guidance document for salinity adjustment of sample
- Salinity adjustment: 642mL effluent + 258mL HSB + 9mL test nutrient solution
- Salinity of samples adjusted from 5ppt to 30ppt

viii. Type and source of control/dilution water
- Natural seawater collected at the Pacific Environmental Center, Environment Canada, North Vancouver, BC
- Filtered to 0.2µm and autoclaved prior to use
- Salinity adjusted as per EC guidance document to 30ppt with HSB from the same source

ix. Concentrations and volumes of test solutions
- Concentrations (% effluent volume / total volume) tested and total volumes used were:
- Control (Natural Seawater) (0%) - 100mL, 4.5cm depth
- Salinity Control Brine (0%) - 100mL, 4.5cm depth
- 4.5% - 100mL, 4.5cm depth
- 8.9% - 100mL, 4.5cm depth
- 17.8% - 100mL, 4.5cm depth
- 35.6% - 100mL, 4.5cm depth
- 71.3% - 100mL, 4.5cm depth

x. Number of replicated per concentration
- 3 replicates per concentration

xi. Number of organisms per test chamber
- 5 female branches + 2 male branches per chamber

xii. Measurements of pH, temperature, dissolved oxygen, and salinity of sample before use
- pH - 7.93, T - 23.5°C, DO - 9.4mg/L, salinity - 5ppt

xiii. Measurements of pH, temperature, dissolved oxygen, and salinity of sample during test
- DO: 7.8 - 8.0 mg/L, pH: 7.74 - 8.98, T: 23°C, salinity: 30ppt

Results

i. Number and % mortality of female plants after recovery in each test solution
- Totals from all 3 replicates are presented:
- Control (0%): 0 (0%) mortality
- Salinity Control (0%): 0 (0%) mortality
- 4.5%: 0 (0%) mortality
- 8.9%: 0 (0%) mortality
- 17.8%: 0 (0%) mortality
- 35.6%: 0 (0%) mortality
- 71.3%: 0 (0%) mortality

ii. Mean number of cystocarps per plant in each test concentration
- Control (0%): 57.4; 49.6; 44.2
- Salinity Control (0%): 66.4; 44.0; 45.2
- 4.5%: 52.2; 51.4; 57.4
- 8.9%: 61.2; 63.6; 41.2
- 17.8%: 30.4; 34.4; 18.6
- 35.6%: 6.6; 6.0; 7.6
- 71.3%: 0.0; 2.4; 1.4

Reporting Requirements for Reference Method EPA/600/4-91/003 Method 1009.0

iii. Estimate of IC_{25} (95% CL) for cystocarp development
- IC_{25} concentration = 13.6 (9.0-16.0)% effluent v/v
- Quantal statistic method was linear interpolation

iv. Current reference toxicity tests (95% CL) for IC_{50} for cystocarp development
- Reference toxicity tests for Toxicant: Sodium Dodecyl Sulfate
- Test conducted on July 29, 2003, within 30 days of effluent test
- Reference toxicant test was conducted under the same experimental conditions as the effluent test
- IC_{50} cystocarp development = 1.19mg/L SDS, 95% CL = 1.14-1.23mg/L

v. Reference toxicity warning limits (+/- 2SD) for IC_{50} for cystocarp development
- Reference toxicity tests for Toxicant: SDS
- 7-d IC_{50} growth = 1.47 (1.17-1.84) mg/L SDS

APPENDIX F

Effluent Metals Concentrations and Loadings

2003 3rd QUARTER MMER REPORT

LOCATION - FINAL DISCHARGE POINT FROM GARROW LAKE (GARROW LAKE DAM SIPHONS)

CONCENTRATIONS OF EFFLUENT FOR MMER SCHEDULE 4 SAMPLED WEEKLY

Sample Taken During The Week of	Date Sample Taken	DELETERIOUS SUBSTANCE (mg/L)[1]								pH[1]	Collection Method
		Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[1]		
07-Jul-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
14-Jul-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
21-Jul-03	25-Jul-03	*0.000*	0.001	*0.005*	0.008	0.001	0.048	*3.0*	*0.005*	7.77	Water Pump
28-Jul-03	30-Jul-03	*0.000*	0.001	*0.005*	0.003	0.001	0.063	*3.0*	*0.005*	7.84	Water Pump
04-Aug-03	05-Aug-03	*0.001*	0.001	*0.005*	0.001	0.001	0.089	*3.0*	*0.005*	7.85	Water Pump
11-Aug-03	12-Aug-03	*0.001*	0.001	*0.005*	0.001	0.003	0.151	*3.0*	*0.005*	7.94	Water Pump
18-Aug-03	19-Aug-03	*0.001*	0.001	*0.005*	0.000	0.003	0.146	8.0	*0.005*	8.1	Water Pump
25-Aug-03	26-Aug-03	*0.001*	0.001	*0.005*	0.001	0.003	0.160	*3.0*	*0.005*	7.96	Water Pump
01-Sep-03	02-Sep-03	*0.000*	0.001	*0.005*	0.003	0.003	0.150	10.0	*0.005*	8.06	Water Pump
08-Sep-03	09-Sep-03	*0.002*	0.001	*0.005*	0.001	0.003	0.158	11.0	0.010	7.94	Water Pump
15-Sep-03	16-Sep-03	*0.001*	0.001	-	0.000	0.004	0.186	5.0	*0.005*	7.96	Water Pump
22-Sep-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]
29-Sep-03	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]	na[2]

Note[1] - All concentrations are in mg/L except Radium 226 which is Bq/L and pH which is in pH units

Note [2] - "na" refers to no effluent discharge to sample

Concentrations in red italics were set to the detection limit

MONTHLY MEAN CONCENTRATIONS OF EFFLUENT FOR MMER SCHEDULE 4

MONTH OF	MONTHLY MEAN CONCENTRATION[1] OF DELETERIOUS SUBSTANCE[2]							
	Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226
July/03	0.000	0.001	0.005	0.006	0.001	0.055	3.00	0.005
August/03	0.001	0.001	0.005	0.001	0.002	0.137	4.25	0.005
September/03	0.001	0.001	0.005	0.002	0.003	0.165	8.67	0.007

Note[1] - All concentrations are in mg/L except Radium 226 which is Bq/L

Note[2] - Monthly Mean Concentrations - the MEAN value of the concentrations measured in all water samples collected during each month when a deleterious substance is deposited.

MASS LOADING OF DELETERIOUS SUBSTANCE FOR EACH DAY SAMPLED

Sample Taken During The Week of	Date Sample Taken	DAILY MASS LOADING OF DELETERIOUS SUBSTANCE (kg/day)[1]								Average Daily Flow Rate (m^3/day)
		Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[1]	
07-Jul-03	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]
14-Jul-03	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]
21-Jul-03	25-Jul-03	0.004	0.044	0.181	0.286	0.046	1.730	108.4	180,615	36,123
28-Jul-03	30-Jul-03	0.026	0.037	0.321	0.205	0.074	4.015	192.7	321,225	64,245
04-Aug-03	05-Aug-03	0.038	0.052	0.384	0.064	0.110	6.843	230.2	383,590	76,718
11-Aug-03	12-Aug-03	0.089	0.081	0.443	0.110	0.227	13.388	266.0	443,310	88,662
18-Aug-03	19-Aug-03	0.097	0.094	0.484	0.045	0.257	14.141	774.9	484,295	96,859
25-Aug-03	26-Aug-03	0.113	0.102	0.566	0.129	0.295	18.100	339.4	565,610	113,122
01-Sep-03	02-Sep-03	0.021	0.094	0.525	0.350	0.288	15.762	1050.8	525,415	105,083
08-Sep-03	09-Sep-03	0.195	0.105	0.489	0.114	0.285	15.441	1075.0	977,270	97,727
15-Sep-03	16-Sep-03	0.080	0.079	-	0.037	0.291	14.817	398.3	398,305	79,661
22-Sep-03	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]
29-Sep-03	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]	na[3]

Note[1] - Mass Loading is in kilograms per day of the deleterious substance deposited except Radium 226 which is in Bq per day

Note[2] - Flow Rate must be taken at the same time as samples are effluent qualtity samples are taken

Note [3] - "na" refers to no effluent discharge to sample

MASS LOADING PER CALENDAR MONTH FOR EACH DELETERIOUS SUBSTANCE

CALENDAR MONTH OF	MASS LOADING[1] FOR DELETERIOUS SUBSTANCE (kg/month)[2]								Average Weekly Flow Rate[3] (m^3/week)	Total Monthly Volume[4] (m^3/month)
	Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[2]		
July/03	0.45	1.25	7.78	7.62	1.85	89	4,667	7,778,520	351,288	1,555,704
August/03	2.61	2.55	14.55	2.69	6.89	407	12,480	14,545,239	656,882	2,909,048
September/03	2.96	2.77	15.21	5.01	8.64	460	25,241	19,009,900	659,099	2,824,710

Note[1] - Total Mass Loading for Calendar month calculated by multiplying the Average Daily Mass Loading for the Month x # days in the month

Note[2] - Mass loading units are in kg per month except Radium 226, which is in Bq permonth

Note[3] - Average Weekly Flow Rate calculated by multiplying Average Daily Flow Rate x 7 days per week

Note[4] - Total Monthly Volume calculated by multiplying Average Daily Flow Rate for the month x days in month

APPENDIX G

Results of Effluent Characterization

RESULTS OF EFFLUENT CHARACTERIZATION

AS PER PARAGRAPH 15(1)(a)

Nine effluent samples were collected on a weekly basis during the 3rd Quarter of 2003 beginning on July 25, 2003 and ceasing on September 16, 2003. Three of the nine samples were "monthly" samples and analysed for a wider suite of elements, as per the guidance document. Monthly loadings of metals to Garrow Bay were calculated based on average weekly discharge volumes from Garrow Lake to Garrow Bay via the creek outflow.

No holding times were missed for any of the water chemistry of toxicity testing samples.

Water samples for acute and sublethal toxicity testing were collected using a pump system from about 20 m downstream of the dam on Garrow Lake, within the main flow of the creek. Acute Lethality Testing was conducted during three months (July, August, and September) during the quarter. There were no adverse effects observed for either the 96-hr Rainbow Trout toxicity test, or the 48-hr *Daphnia magna* toxicity test. LC_{50} values were >100% effluent for both species in all testing events.

Sublethal Toxicity Testing was conducted once during August 2003. As this is considered a marine discharge, marine species were used for sublethal testing following brine adjustment of the brackish effluent (as per test protocols). Testing for fish (7-d Topsmelt growth and survival) and invertebrates (Sand dollar) was conducted at EVS Environment Consultants, Vancouver, while algae (48-h *Champia*) testing was undertaken by the Saskatchewan Research Council, Saskatoon.

There were no effects observed in the Topsmelt Survival and Growth Test at 100% effluent v/v.

Sublethal effects were observed for the echinoid and algal tests and concentrations less than 100% effluent v/v. In the echinoid *(Dendraster excentricus)* fertilization test (EVS Consultants), the LOAEL was 4.6% v/v effluent, the IC_{25} was 3.8% v/v, and the IC_{50} was 13.0% v/v. In the *Champia parvula* sexual reproduction test (Saskatchewan Research Council) the LOAEL was 17.8% v/v effluent, the IC_{25} 13.6% v/v, and the IC_{50} was 18.8% v/v.

Zinc was the primary contaminant of potential concern (COPC) identified in mine effluent and is the only metal to consistently exceed BC Ambient Water Quality Guidelines (BC AWQG) in effluent. During the 9 week discharge period, effluent zinc concentration averaged 128 ± 49µg/L (range 48 – 186µg/L), which is well below the MMER effluent limit of 500µg/L. The BC AWQG is 10µg/L. On August 19, 2003, when the sublethal samples were collected, the concentration of Zn in the effluent was 146µg/L. Converting the echinoid test endpoints into Zn concentrations results in a Lowest Observed Adverse Effect Level (LOAEL) of 6.7µg/L Zinc, an IC_{25} of 5.5µg/L, and an IC_{50} of 19.0µg/L. Reference toxicity tests of zinc on *Dendraster* fertilization give mean EC_{50} concentrations of 8.5-60µg/L (Dinnel et al. 1983). The concentration of zinc in the effluent that corresponds to the IC_{50} (i.e., 19.0µg/L) is within the effects range reported in reference *Dendraster* fertilization tests. Thus the echinoid test is quite sensitive to zinc, with the LOAEL being less than the BC AWQG concentration.

Endpoints for the *Champia* test in terms of zinc concentrations were 26.0µg/L Zn (LOAEL), 19.9µg/L (IC_{25}), and 27.4µg/L (IC_{50}). The reference IC_{25} endpoint for zinc in the *Champia* test performed in-house at SRC was 27µg/L (95% confidence limits 16-42µg/L). This reference concentration is very similar to zinc concentrations in the mine effluent at the toxicity endpoints observed in the *Champia* test. *Champia* also appears to be sensitive to zinc concentrations at or below the BC AWQG.

Given the similarity between zinc concentrations in the effluent samples and the effects concentrations of zinc in reference tests, it is likely that zinc is responsible for the sublethal effects observed in both the *Dendraster* and *Champia* tests.

Reference: Dinnel, P.A., Q.J. Stober, J.M. Link, M.W. Letourneau, W.E. Roberts, S.P. Felton, and R.E. Nakatan. 1983. Methodology and Validation of a Sperm Cell Toxicity Test for Testing Toxic Substances in Marine Waters. Final Report, FRI-UW-8306, Fisheries Research Inst., School of Fisheries, University of Washington, Seattle, WA :208. Source: EPA EcoTox database.

APPENDIX 8

EMERGENCY SPILL RESPONSE TRAINING

SNC·LAVALIN
Engineers & Constructors

Spill Training

Formal spill training commenced in April after the contingency plan was finalized. The first session was held on April 20 2003.

Session One:
Attendance: P Newham
A Aubry
P Simms
B Power
E Roy
J Laverne
E Weidhaas
This was classroom training involving the inspection of containment berms, and the importance of carrying absorbent pads in all equipment.

Training Session Two :
This was classroom training involving the use of the zoom boom and the boats. This was conducted on June 8/03

Attendance:
P Simms
J Bonia
J Halle
J Laverne
JSingleton
E Roy
B Power

Training Session Three :
Training date July 24/03
This training was more in depth. as the fuel ship MV ARCTIC was arriving with 4.7 million liters of P50 diesel fuel. The training involved the placement of the boats. There was a ramp constructed to have easy access to remove the zoom boom. The zoom boom was put in place , and different scenarios were discussed.
The off loading of fuel procedure was discussed with the E.R.T. and recommendations, requested were addressed with written procedures. Absorbent sheets were made available and the use discussed with the team. PPE was discussed with all personnel involved.
A action plan was put in place and followed.
Attendance:
V Rice
J Singleton
S Lemieux
J Halle
R Parsons
B Power
J Jones

Training Session Four :

Training date was Oct 19/03and Dec 15/03
This was classroom training and the areas discussed were all fuel storage areas, the fuel line used daily to accommodations and the tank farm. The location of the spill kits and the location of the absorbent pads. The seasonal diversities and adverse weather conditions were discussed and how to respond.

Attendance:
P Newham
Jim Bonia
R Peroli
V Rice
R Langlois
J Jones
R Parsons
B Power

Additional Dialogue On Prevention

The importance of spill prevention and emergency response is a frequently discussed topic during daily FLRA meetings. All equipment operators are required to carry absorbent pads in their equipment in case of hydraulic leaks.

The location of spill containers is well communicated on site. Audits are conducted weekly on the contents of the containers and ordered as required.

Fuel transfers are done daily and pipelines and tank monitored during transfer.

All tanks and equipment are monitored when being fuelled

Ed Weidhaas
Safety Coordinator

APPENDIX 9

WORKERS' COMPENSATION BOARD

APPROVAL OF

MINE PORTAL SEAL DESIGN

WORKERS' COMPENSATION BOARD
Northwest Territories and Nunavut

xc	SNC - Transmittal Circ.
Re	RID ILL RIH

October 16, 2003

FAX (867) 253 6862

Mr J. Knapp
Manager
Teck Cominco Metals Ltd.
Polaris Reclamation Project
P.O. Box 188, Resolute Bay,
NU X0A 0V0

Dear Mr. Knapp:

Re: Polaris Mine Closure – Portal Plug Design

Thank you for your letter dated October 1, 2003 and the attached design drawings No. 23307-0 and No. 23307-1 Re: Portal Plug Design.

I have reviewed the document and found it meet or exceed all the requirements pursuant to section 17.03 of the Mine Health and Safety Regulations. I hereby grant Teck Cominco Metals Ltd. the approval of the design as presented to seal off all portal openings at Polaris.

Yours truly

Sylvester Wong, P.Eng.
Chief Inspector of Mines

APPENDIX 10

ELECTRONIC VERSION OF

4th QUARTER 2003

RECLAMATION REPORT

(PDF VERSION)