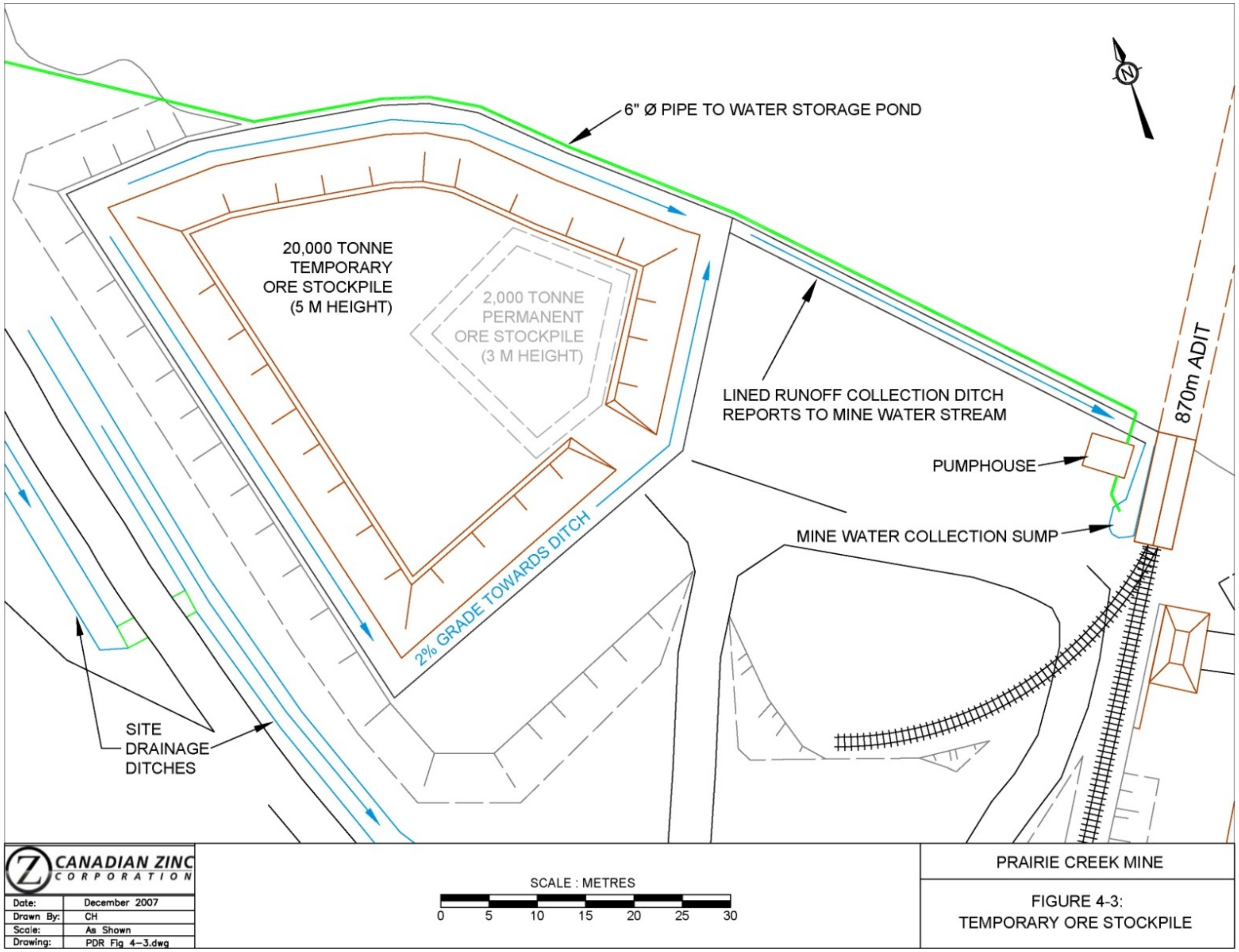
Ore Stockpile



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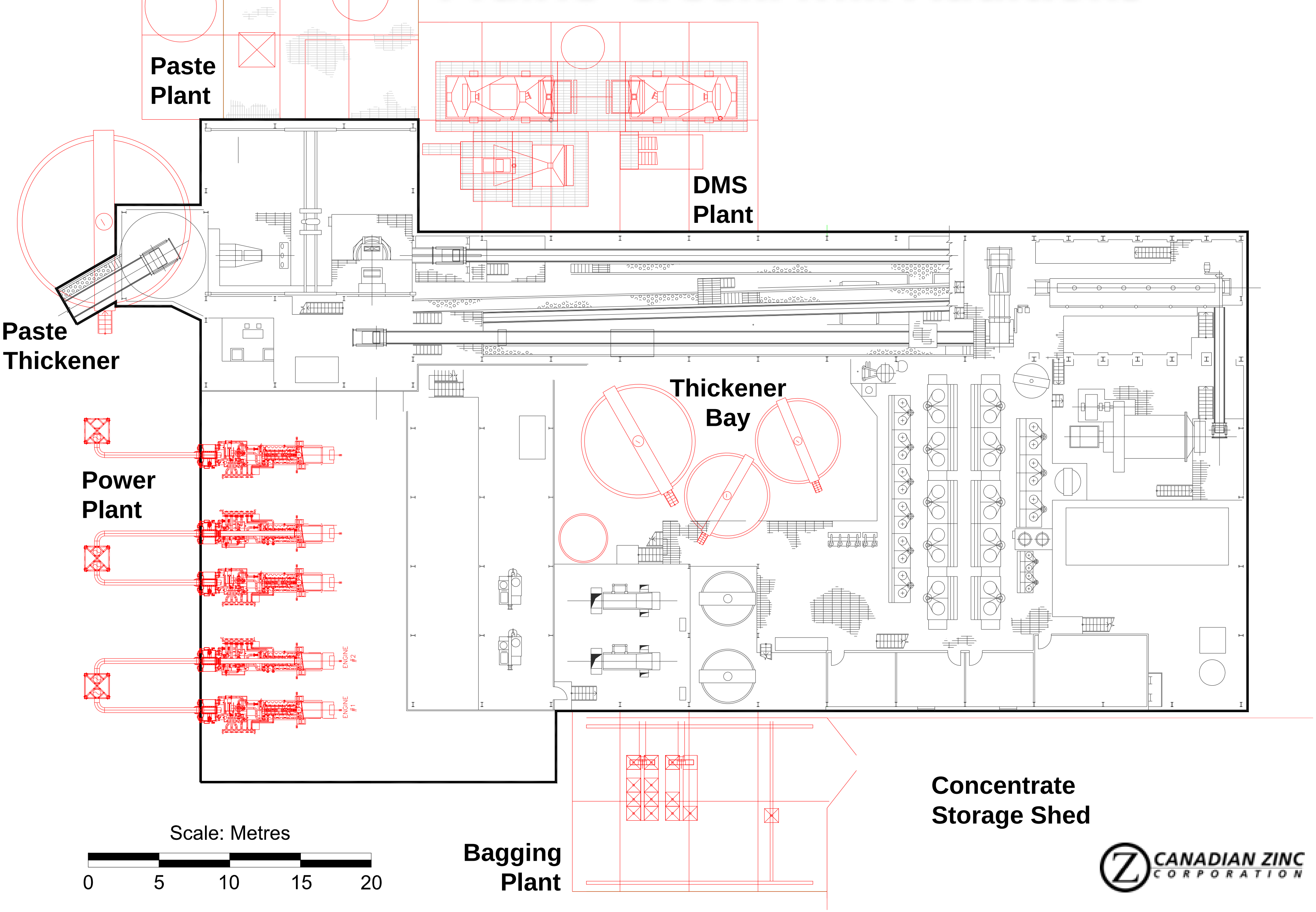
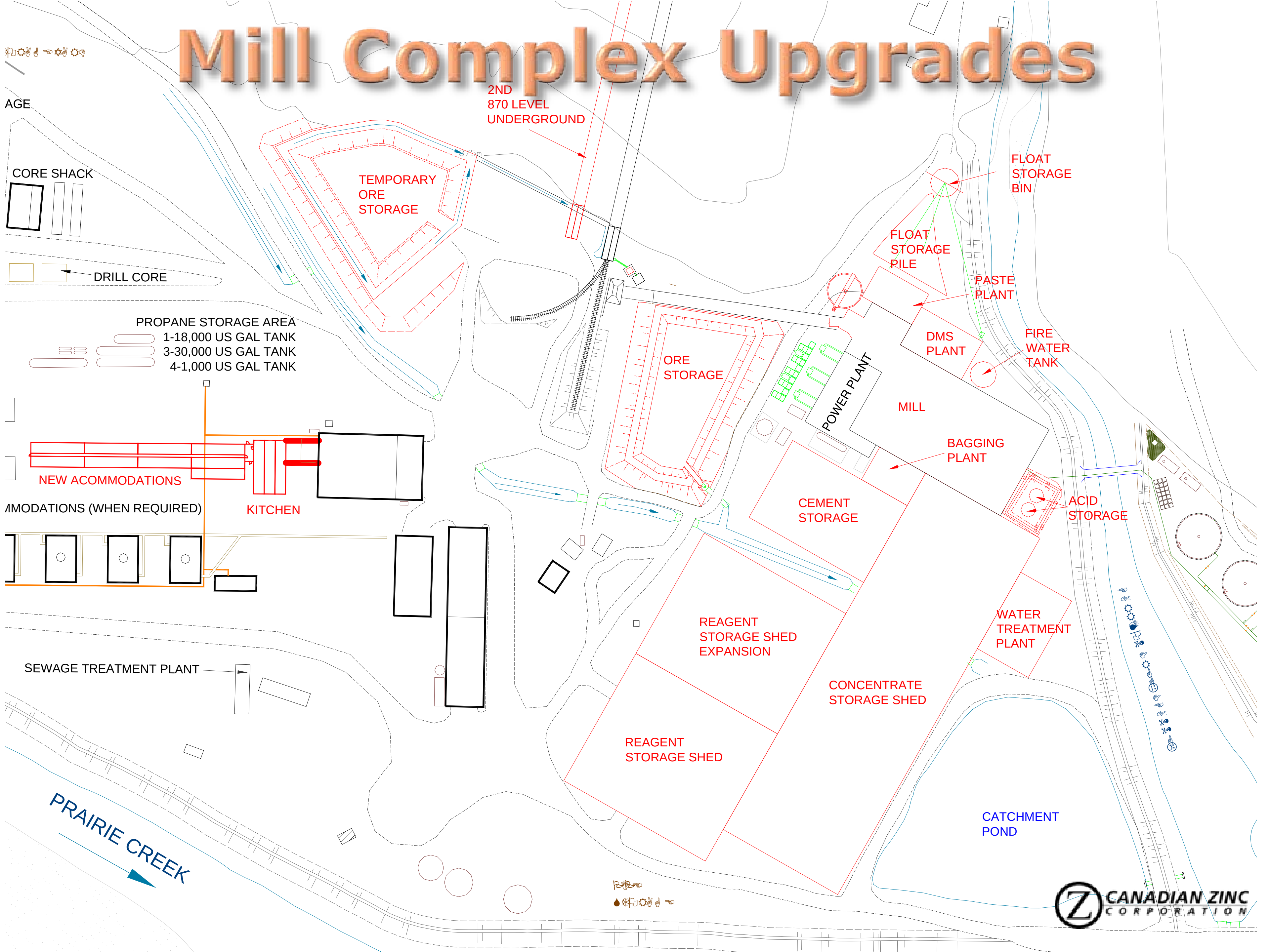
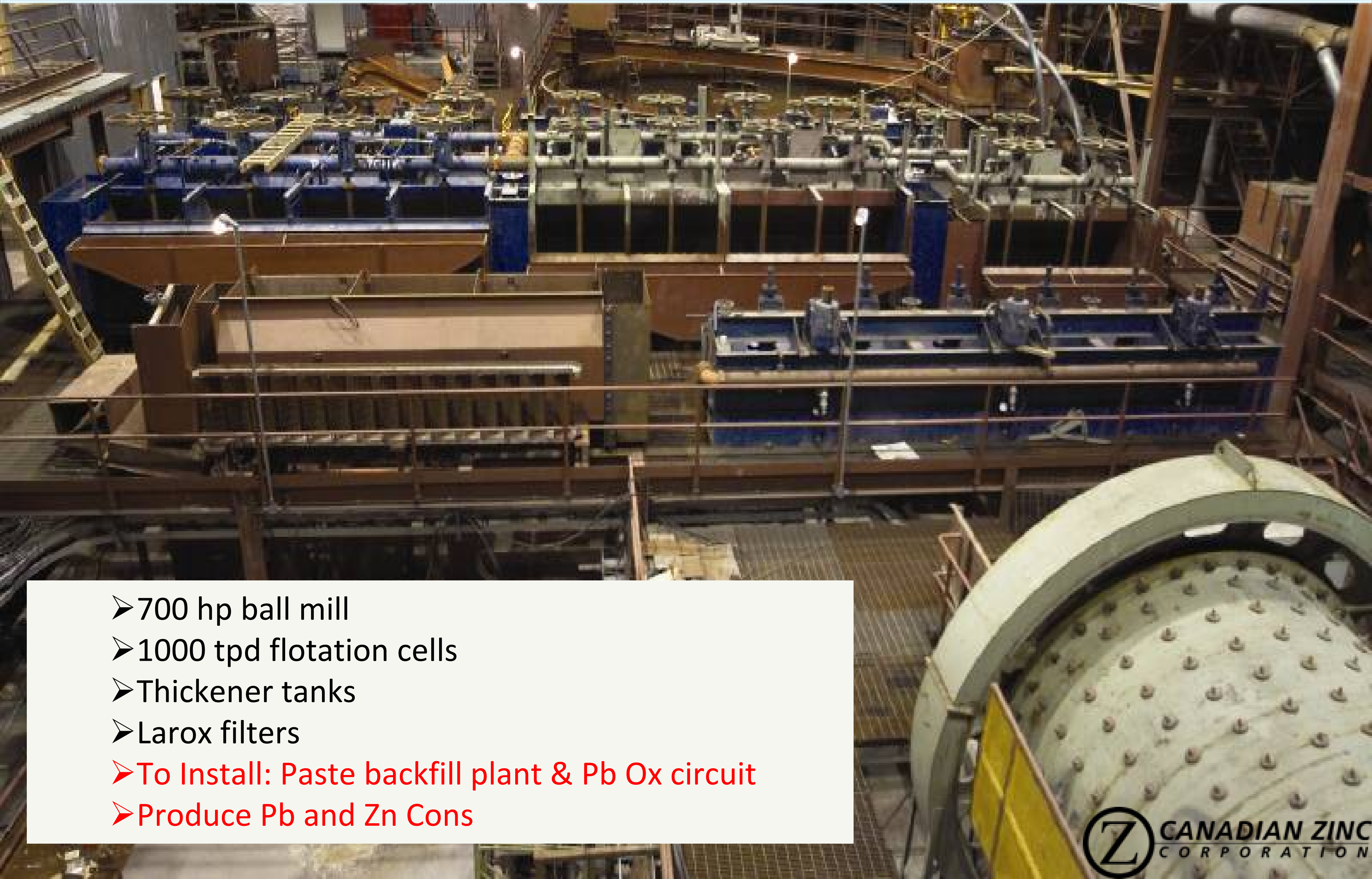
Prairie Creek: Mill Additions



Mill Complex Upgrades



Mill: Grinding & Flotation Circuit



- 700 hp ball mill
- 1000 tpd flotation cells
- Thickener tanks
- Larox filters
- To Install: Paste backfill plant & Pb Ox circuit
- Produce Pb and Zn Cons

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New 1566 kw Generators (3 Units)

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New Incinerator

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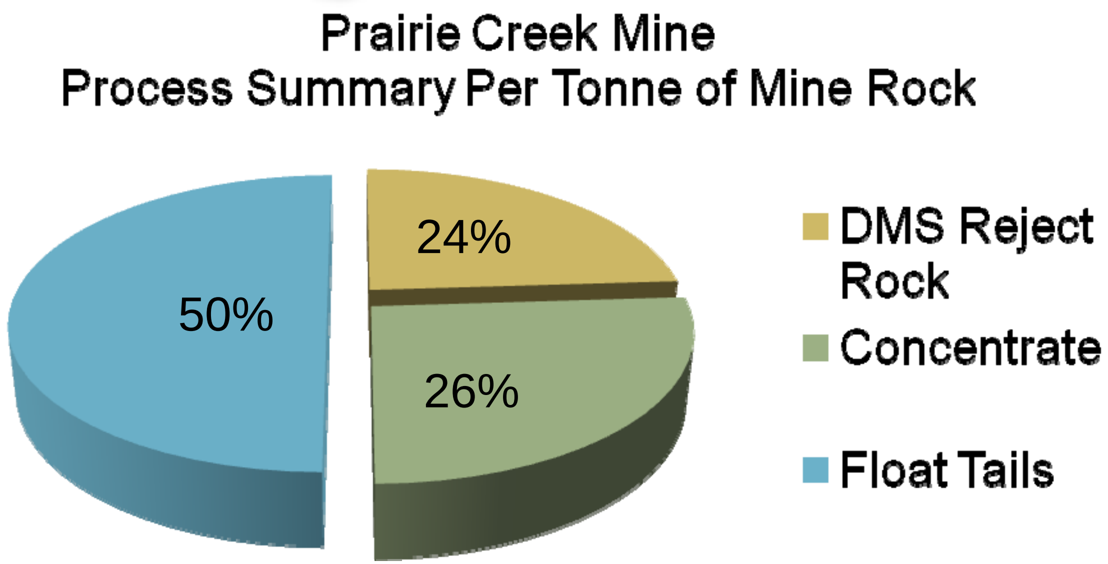
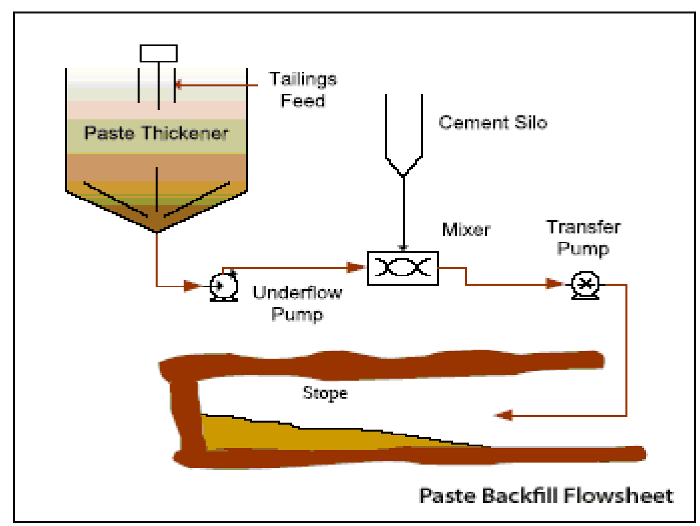
Metallurgical Summary





Mine Waste Management

- Float tails and portion of DMS rock backfilled underground. All float tails fits with contingency
- Waste Rock Pile for development rock and excess DMS rock
- Conversion of original tailings pond to Water Storage Pond to allow recycle, up to 50,000 tonnes start-up float tails storage

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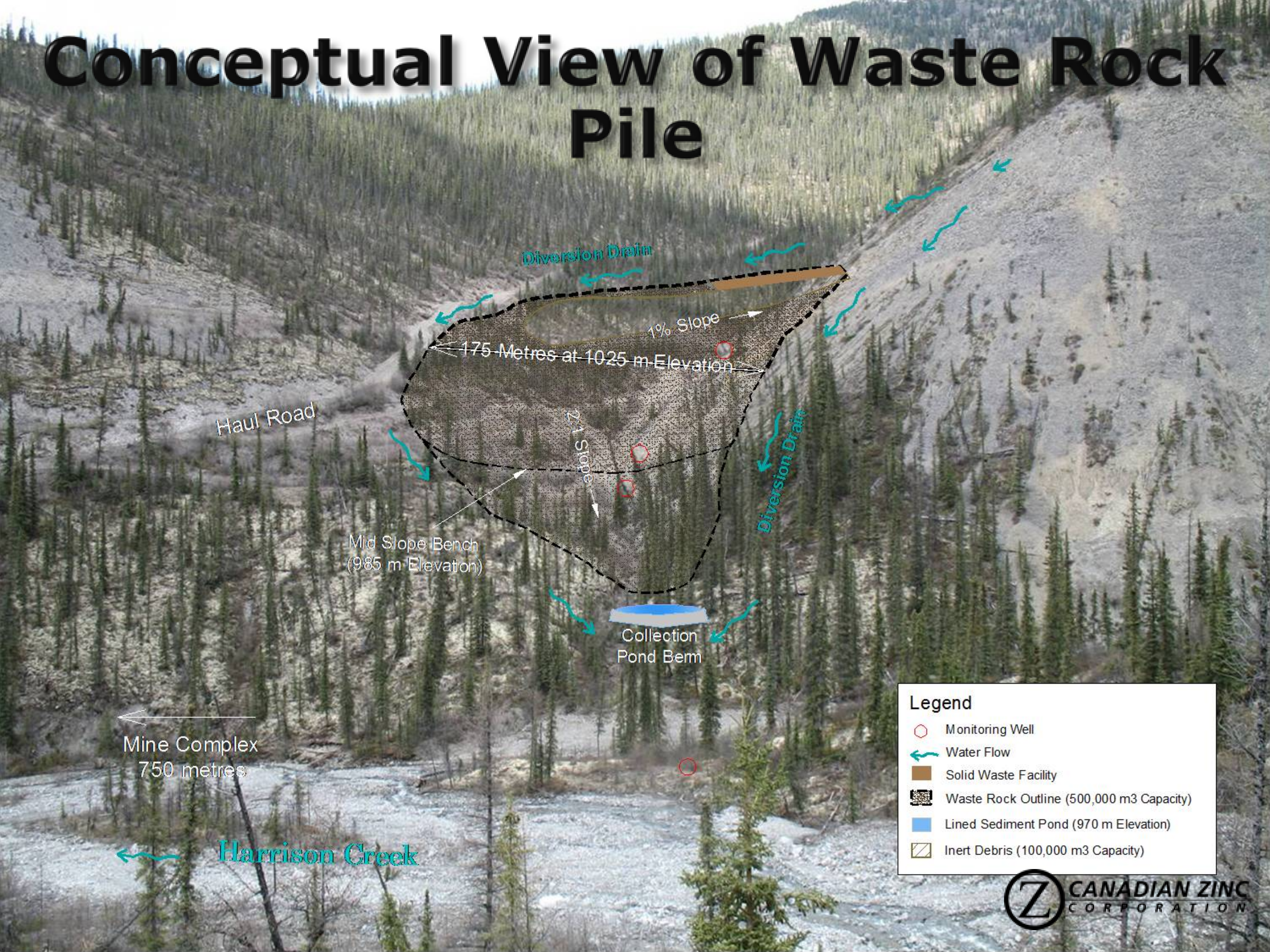
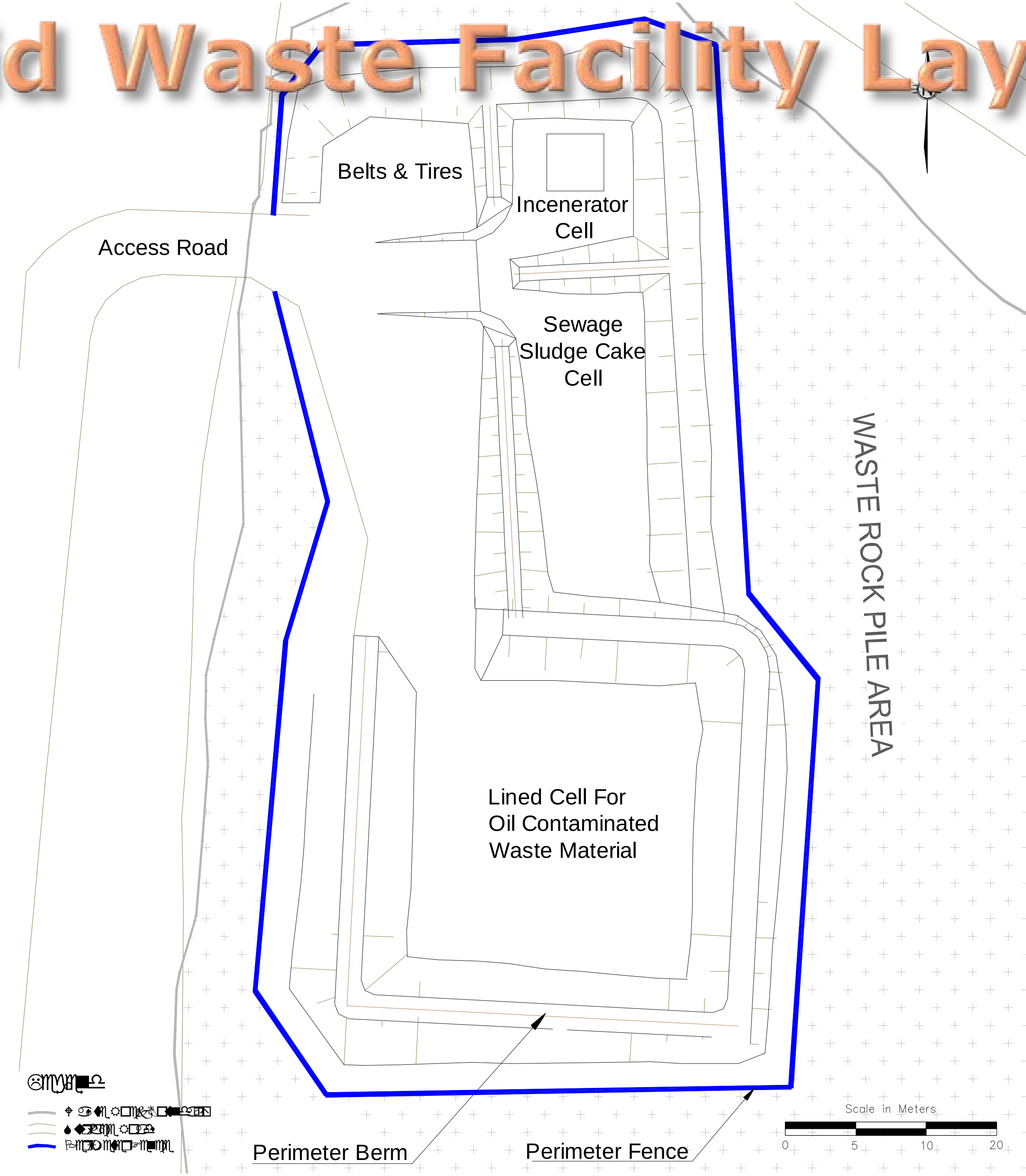
Conceptual View of Waste Rock Pile



Solid Waste Facility Layout



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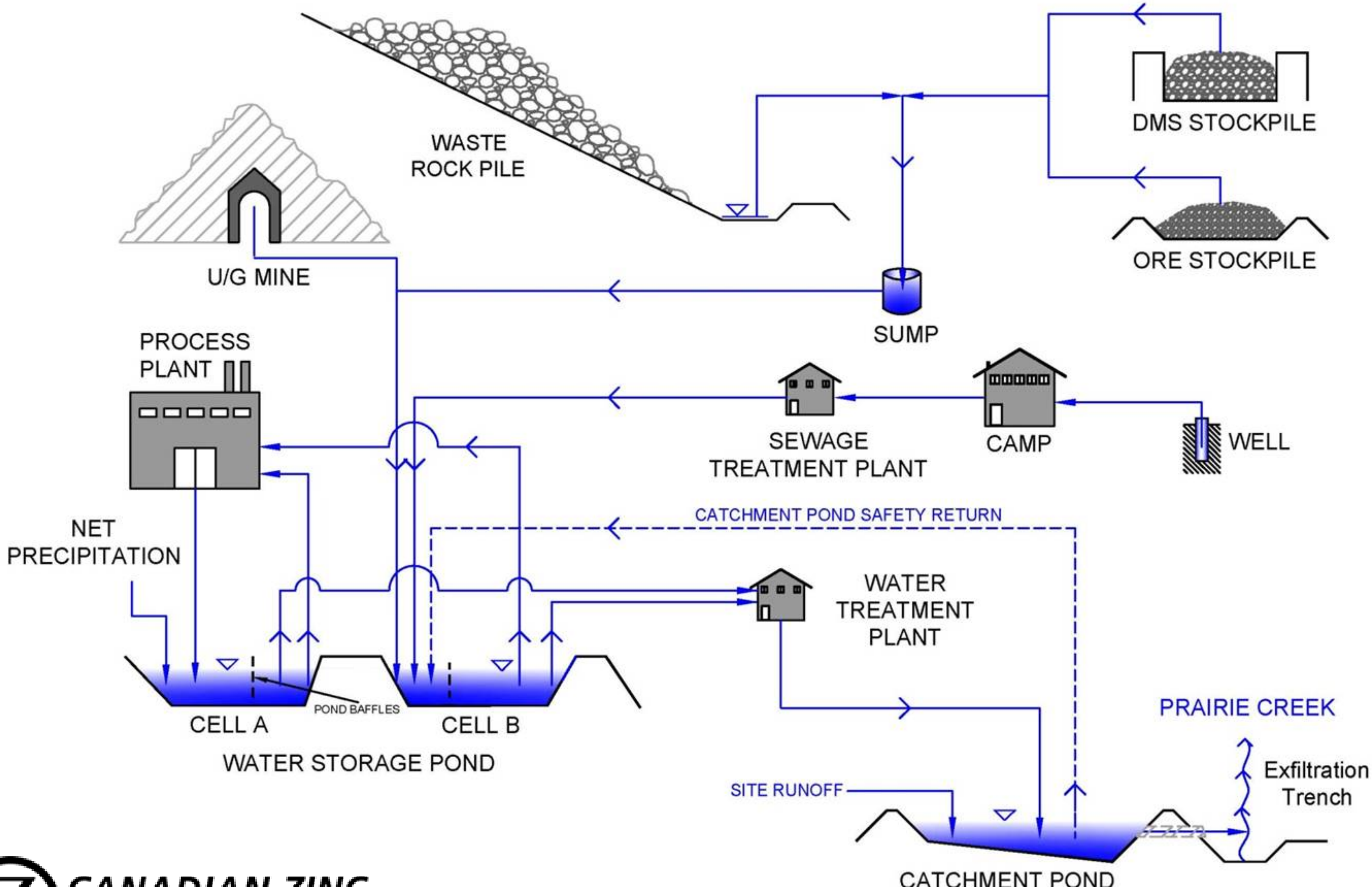
Future Operating Prairie Creek Mine

Site Water Management



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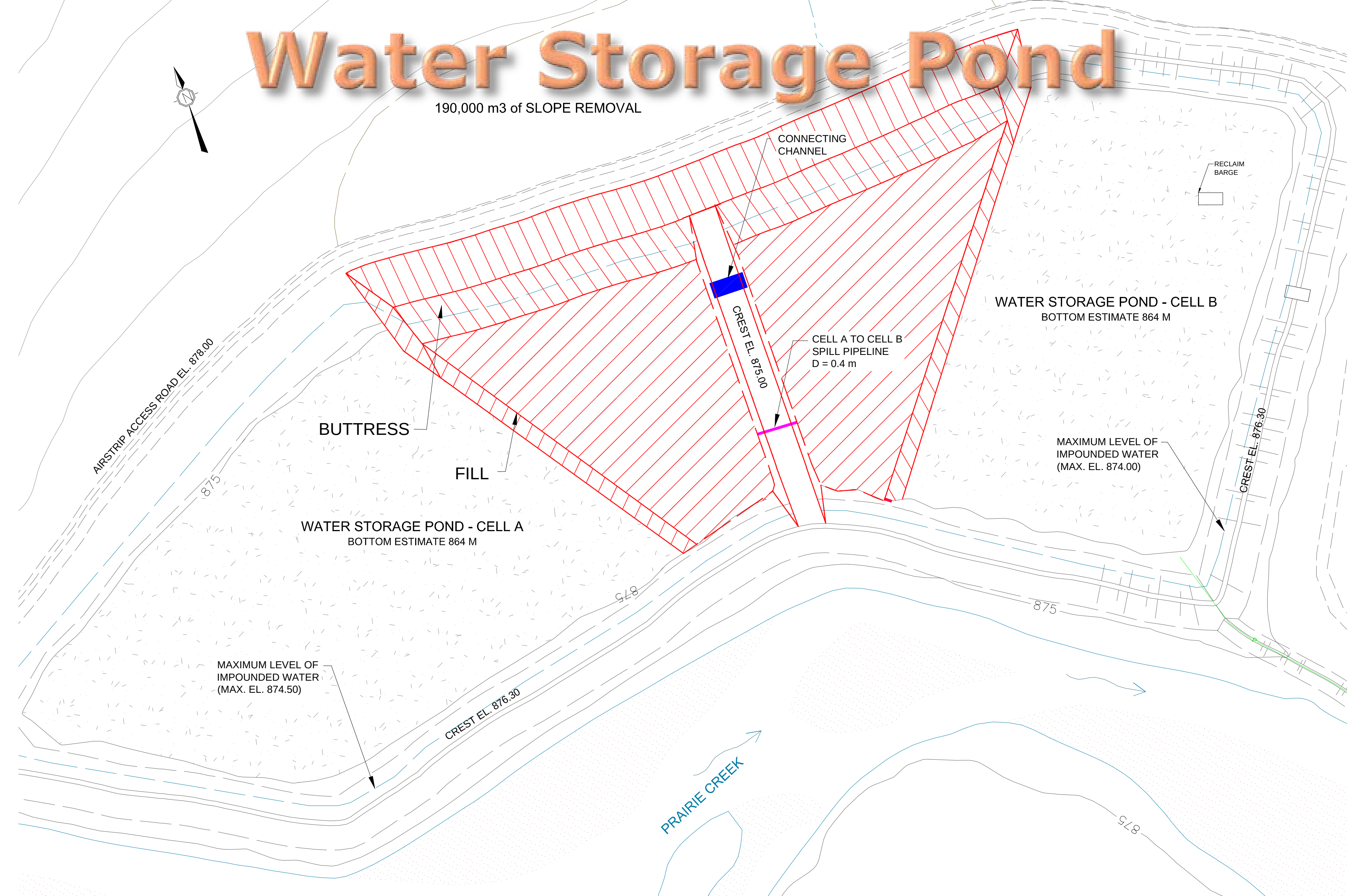

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Date:	October 2009
Drawn By:	C. Reeves
Scale:	As Shown
Drawing:	DAR Fig 6–17.dwg

SCALE

0 20 40 60 80 100

METRES

PRAIRIE CREEK MINE

FIGURE 6-17:

RECONFIGURED WATER STORAGE POND

Water Use

- Process water ‘aged’ in Water Storage Pond to degrade Mill reagents
- Mill feed is 65% process water, 35% mine water
- Process water recycle limited to 65% by long-term major ion build-up

Water Treatment for Discharge

- Mine water – lime, clarification
- Process water – pH reduction (acid), sulphide, lime, clarification
- Mine water treated and discharged year round, less in winter
- No process water treatment and discharge Feb-Mar, and substantially reduced in other winter months

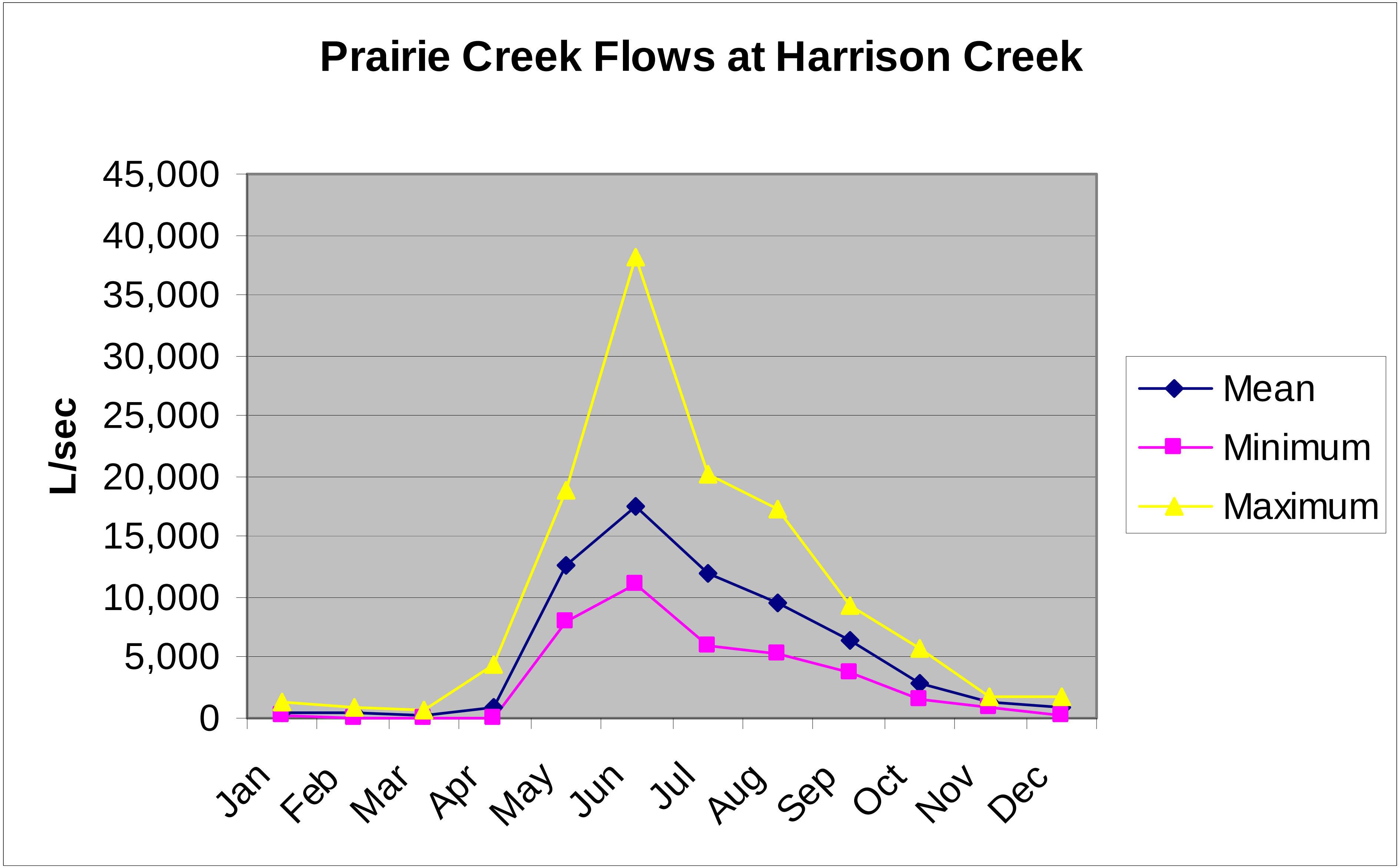
Water Management Contingencies

- Available pond storage
- Short-term increase in process water recycle %
- Use of process water treatment circuit for mine water treatment
- Redundant pumps and power supply
- Emergency use of storage pond freeboard

Predicted Mine Flows (L/sec)

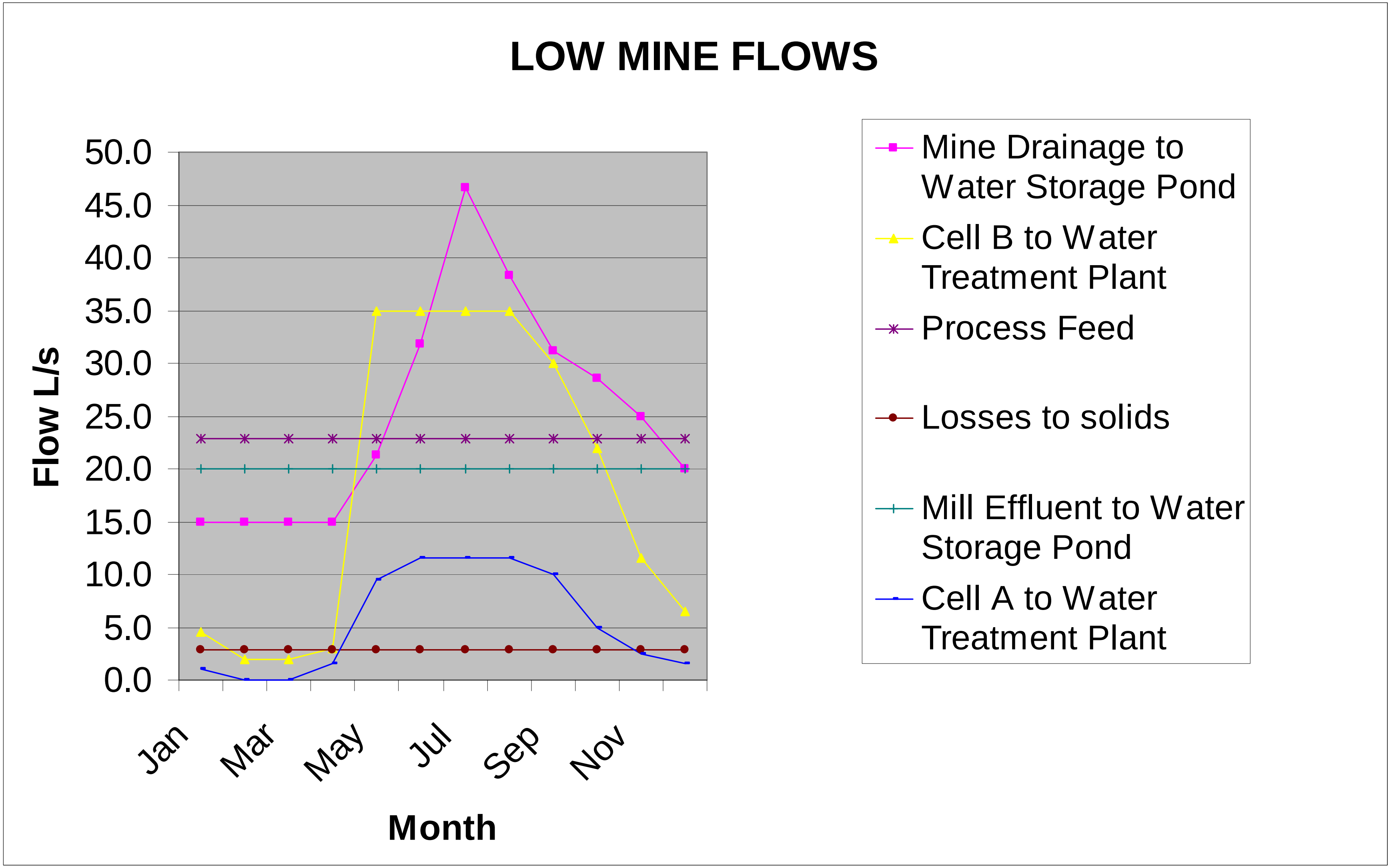
Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.	Probability
Low	15	15	15	15	21	32	47	38	31	29	25	20	25.2	10%
Best	15	15	15	15	41.3	61.7	90.3	74.3	60.5	55.3	25	20	40.7	70%
High	15	15	15	15	83	123	181	149	121	111	25	20	72.7	15%
Extreme	100	100	100	150	207	207	207	207	207	207	150	100	162	5%

flow reduced to account for limited recharge of HCAA during winter freeze-up

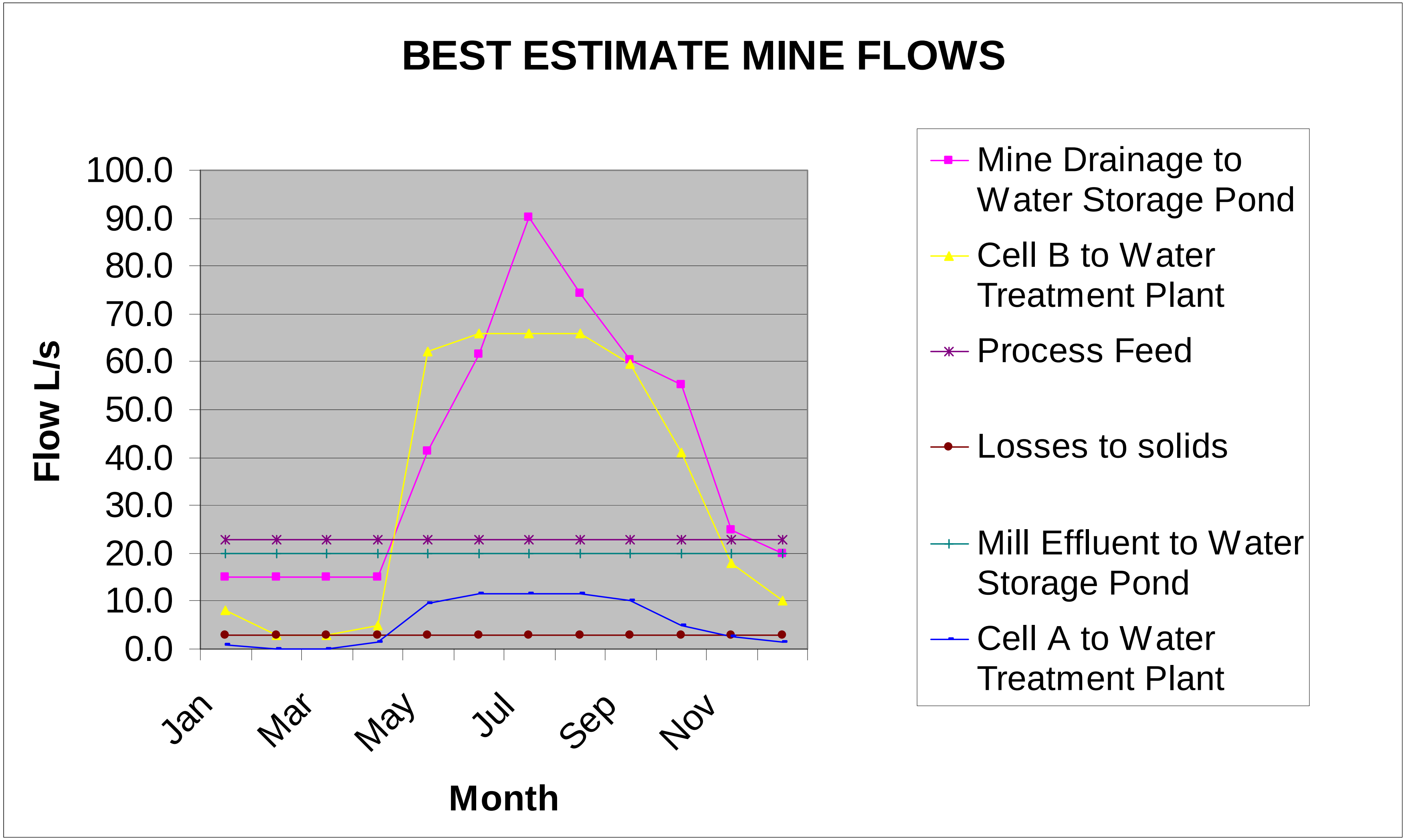


Prairie Creek Flows at Harrison Creek
L/sec
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Mean
Minimum
Maximum

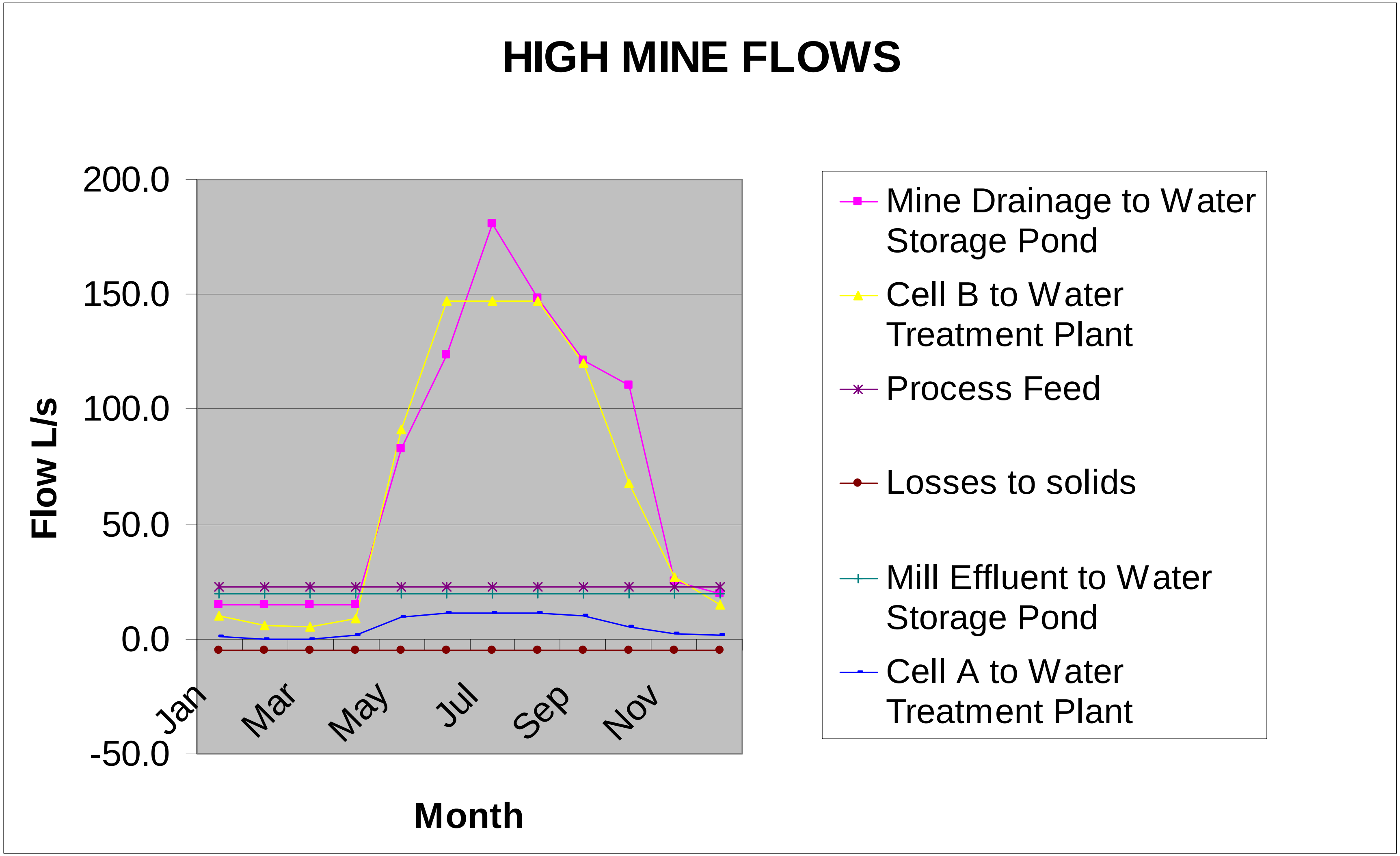
WSP Water Balance



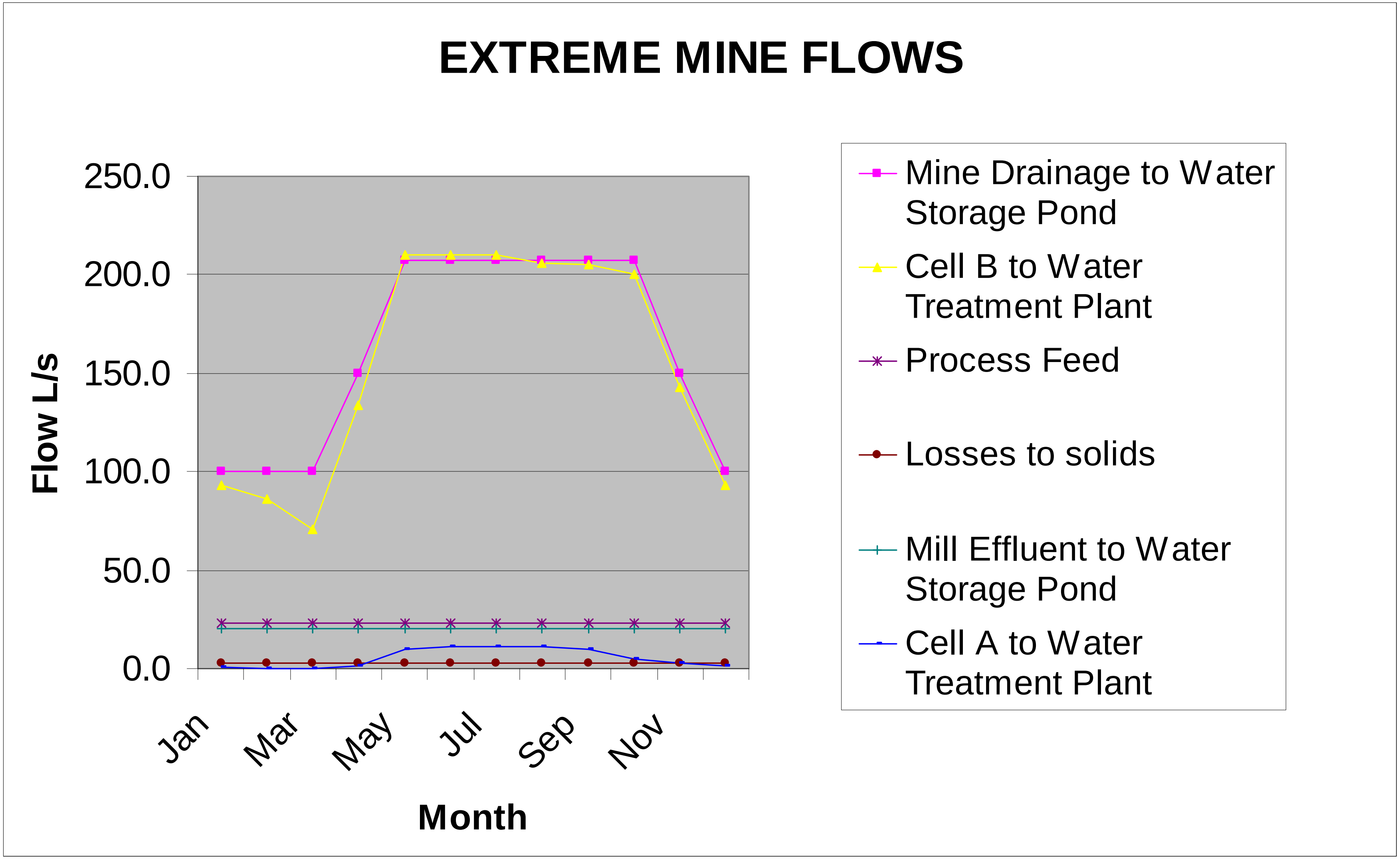
WSP Water Balance



WSP Water Balance



WSP Water Balance



Water Discharge

- All flows collect in lined Catchment Pond
- Discharge via pipes with slots in exfiltration trench extending part way below Prairie Creek channel
- Rapid mixing enables small Initial Dilution Zone (IDZ, 100 m). Vast majority of mixing complete 1.6-30.6 m downstream
- Zone of fish passage maintained around trench location in all seasons

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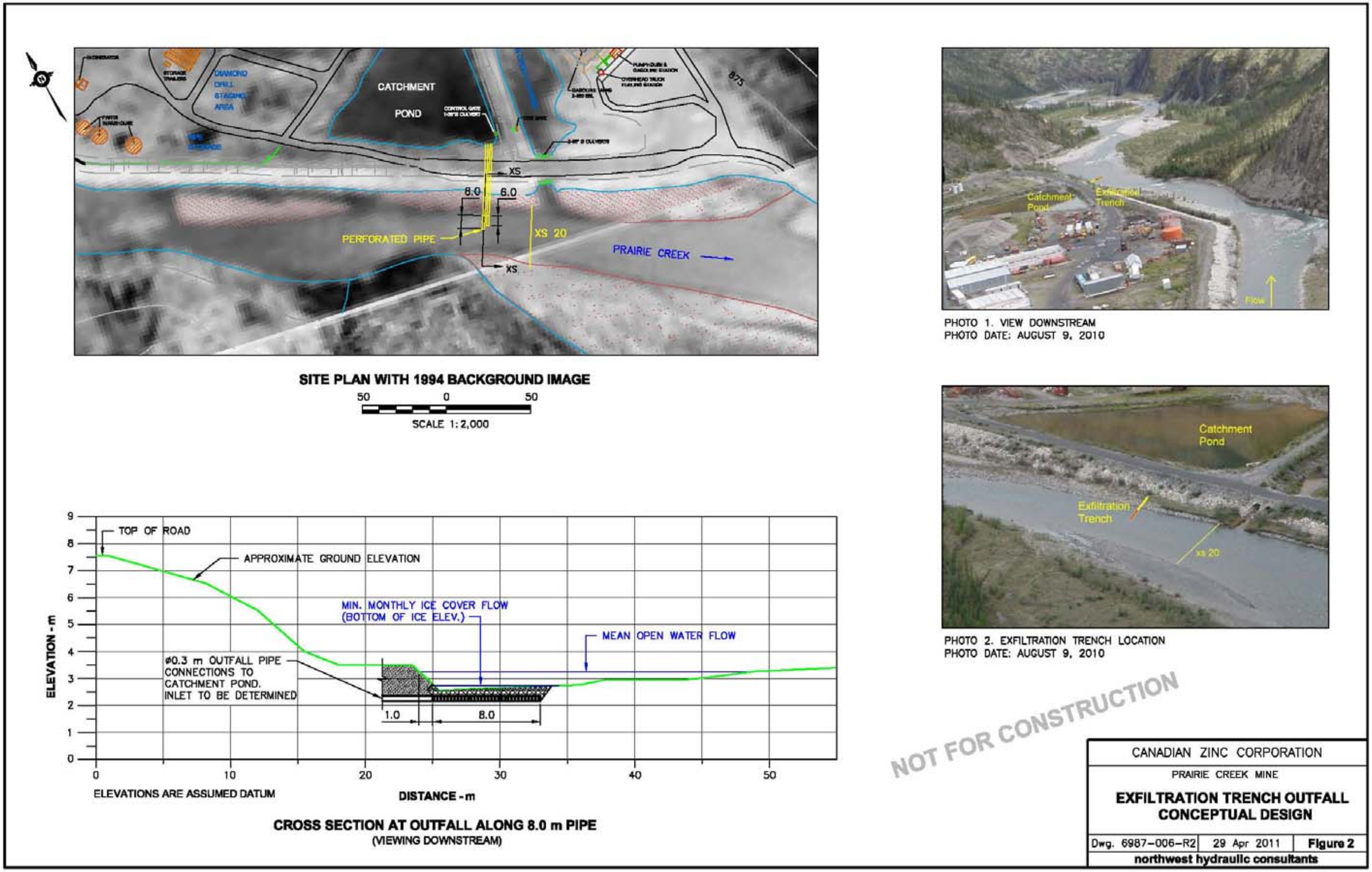
Buried Pipe Discharge



Discharge Water Quality

- Treated process water never >20% in discharge to minimize toxicity
- Toxicity testing confirms discharge will not be acutely toxic
- Exfiltration trench ensures rapid mixing and very small zone of chronic toxicity

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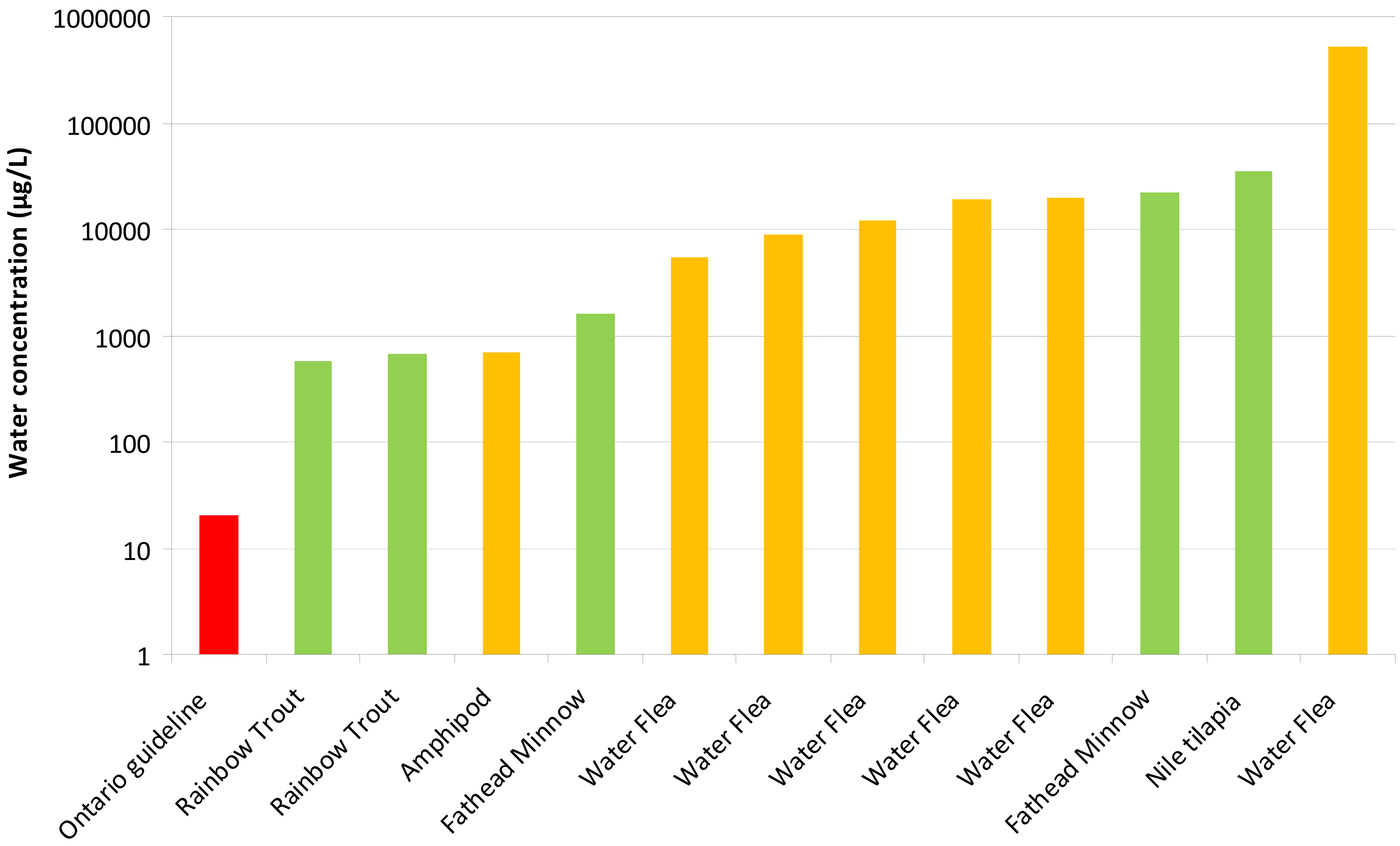
Approach to Ensuring No Significant Effects (Water Quality Objectives)

- Compile reference database of upstream water quality
- Compute mean and 2 standard deviations (M+2SD) of each parameter
- If predicted concentration (for all mine flow scenarios) within M+2SD, no significant effect (and M+2SD adopted as objective)
- If predicted concentrations exceeds M+2SD, review toxicity data and select protective objective

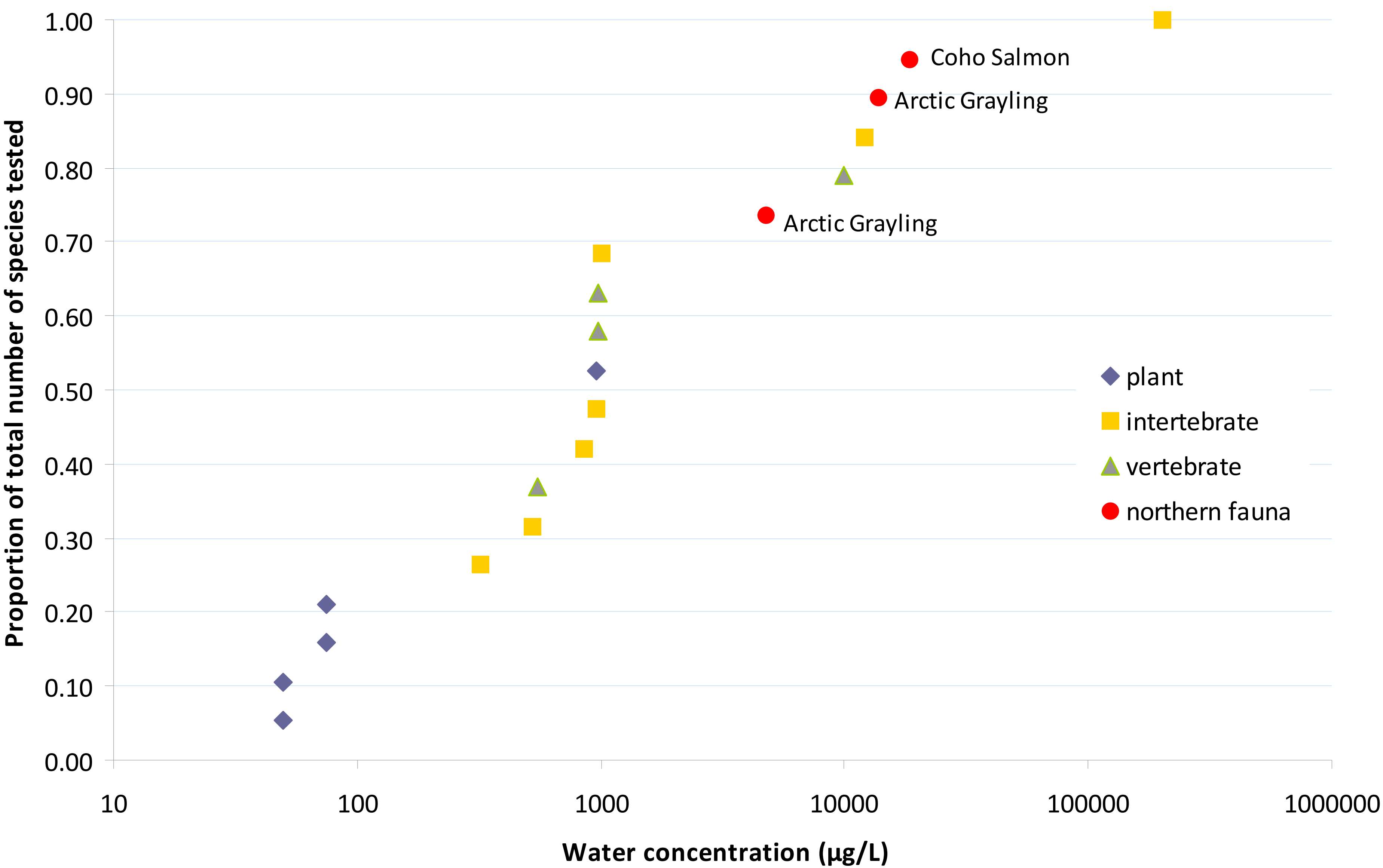
CZN's Proposed Water Quality Objectives

Analyte of Concern	Proposed SSWQO	Derivation/Rationale
Antimony (Sb)	20 µg/L	Ontario guideline (no CCME guideline)
Arsenic (As)	5 µg/L	CCME toxicity fact-sheet including northern species (existing guideline)
Cadmium (Cd)	0.38 µg/L	CCME toxicity fact-sheet including northern species (proposed guideline)
Copper (Cu)	4 µg/L	Northern species toxicity data
Iron (Fe)	242 µg/L	RCA-derived benchmark
Lead (Pb)	7.0 µg/L	Northern species toxicity data (CCME guideline)
Mercury (Hg)	0.026 µg/L	Northern species toxicity data (CCME guideline)
Selenium (Se)	2.22 µg/L	RCA-derived benchmark
Silver (Ag)	0.1 µg/L	CCME (existing guideline)
Zinc (Zn)	35 µg/L	Northern species toxicity data (proposed CCME guideline)
Ammonia (total)	0.409 mg/L[1]	Northern species toxicity data (CCME guideline)
Nitrate	2.9 mg/L	CCME (existing guideline)
Total phosphorus	4 µg/L	CCME (existing guideline for protection of ultra-oligotrophic waters)
Sulphate	200 mg/L	Based on hardness-based, dose-response relationships published in Elphick *et al*. (2010)
TDS	413 mg/L	RCA-derived benchmark

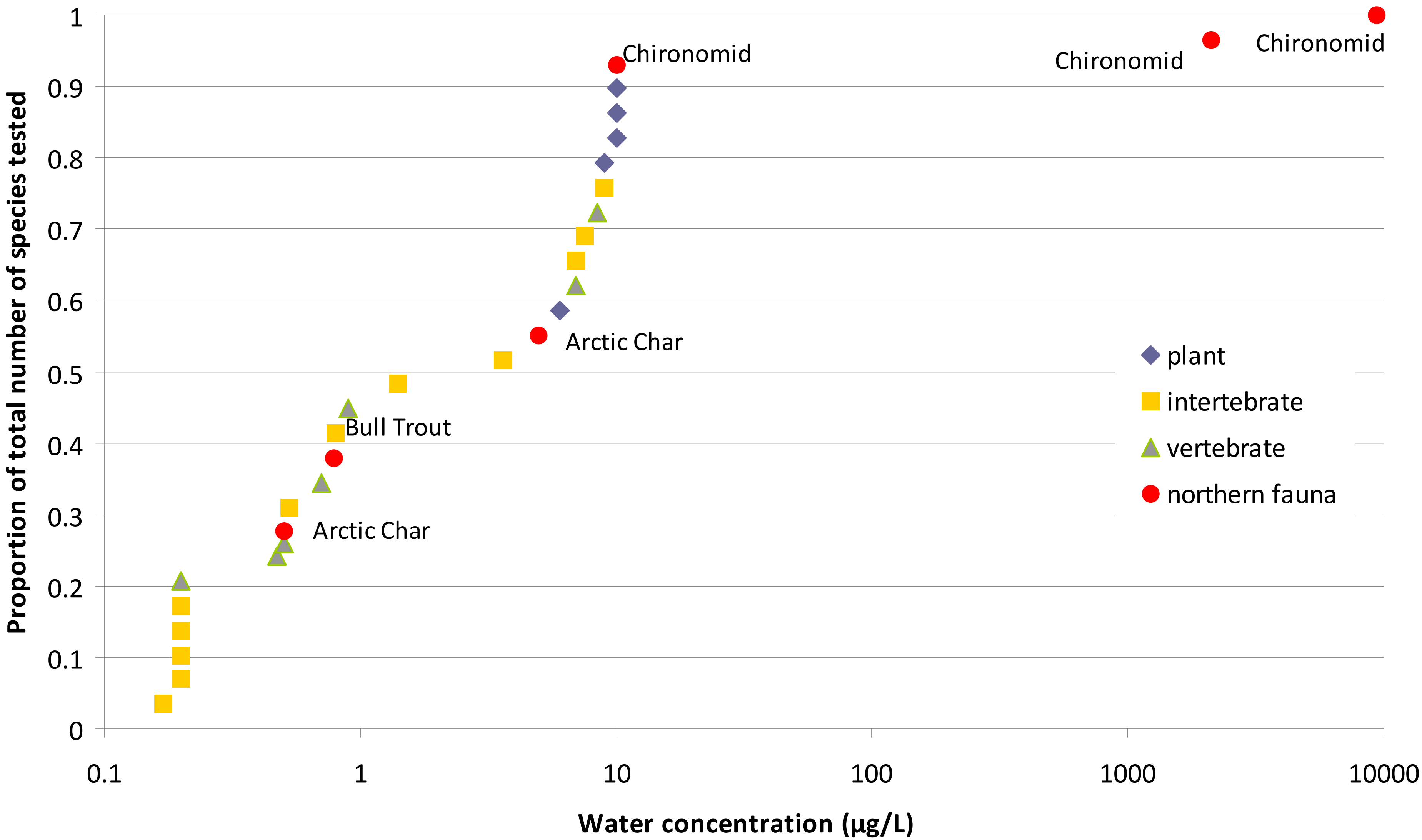
Antimony Toxicity Data



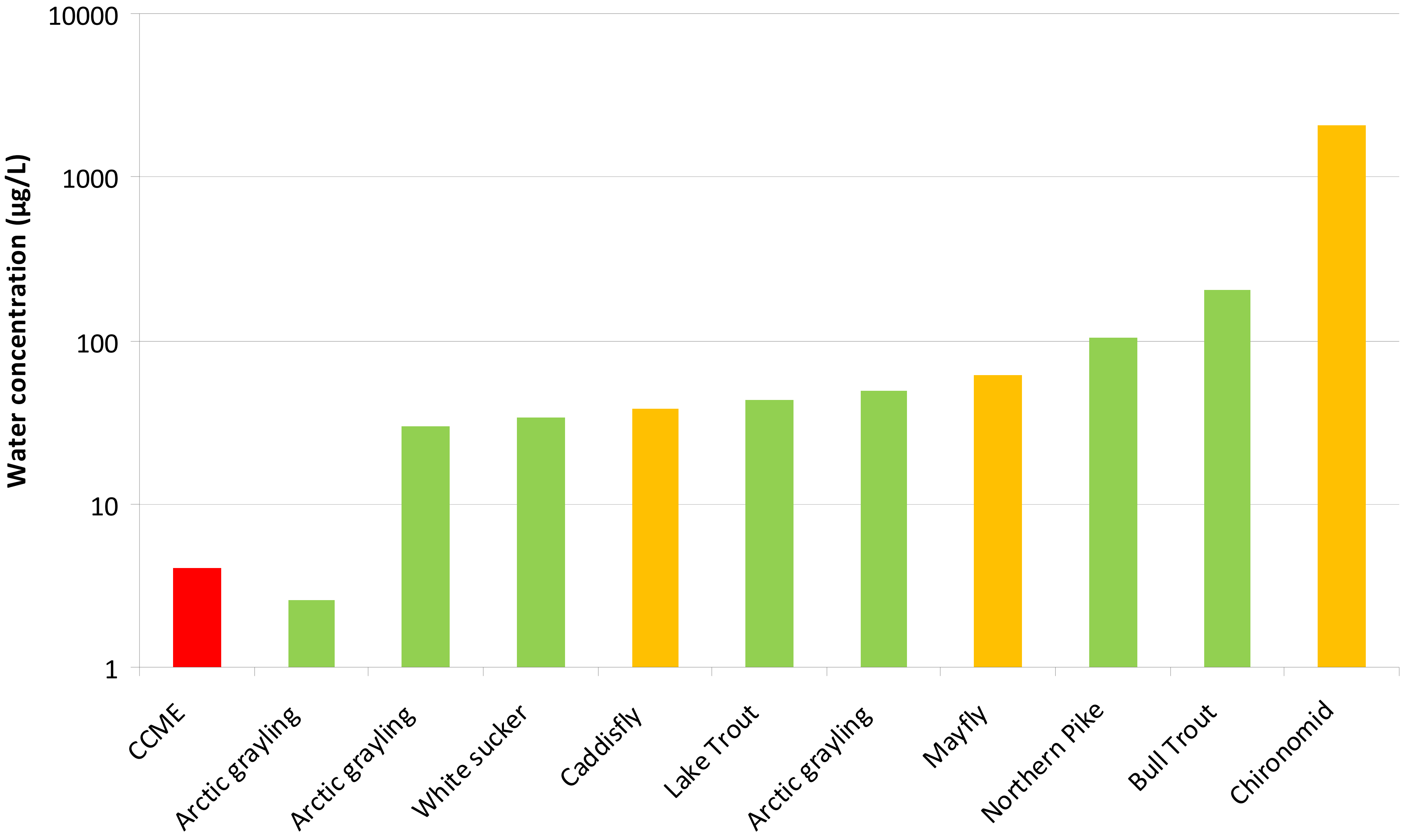
Arsenic Toxicity Data



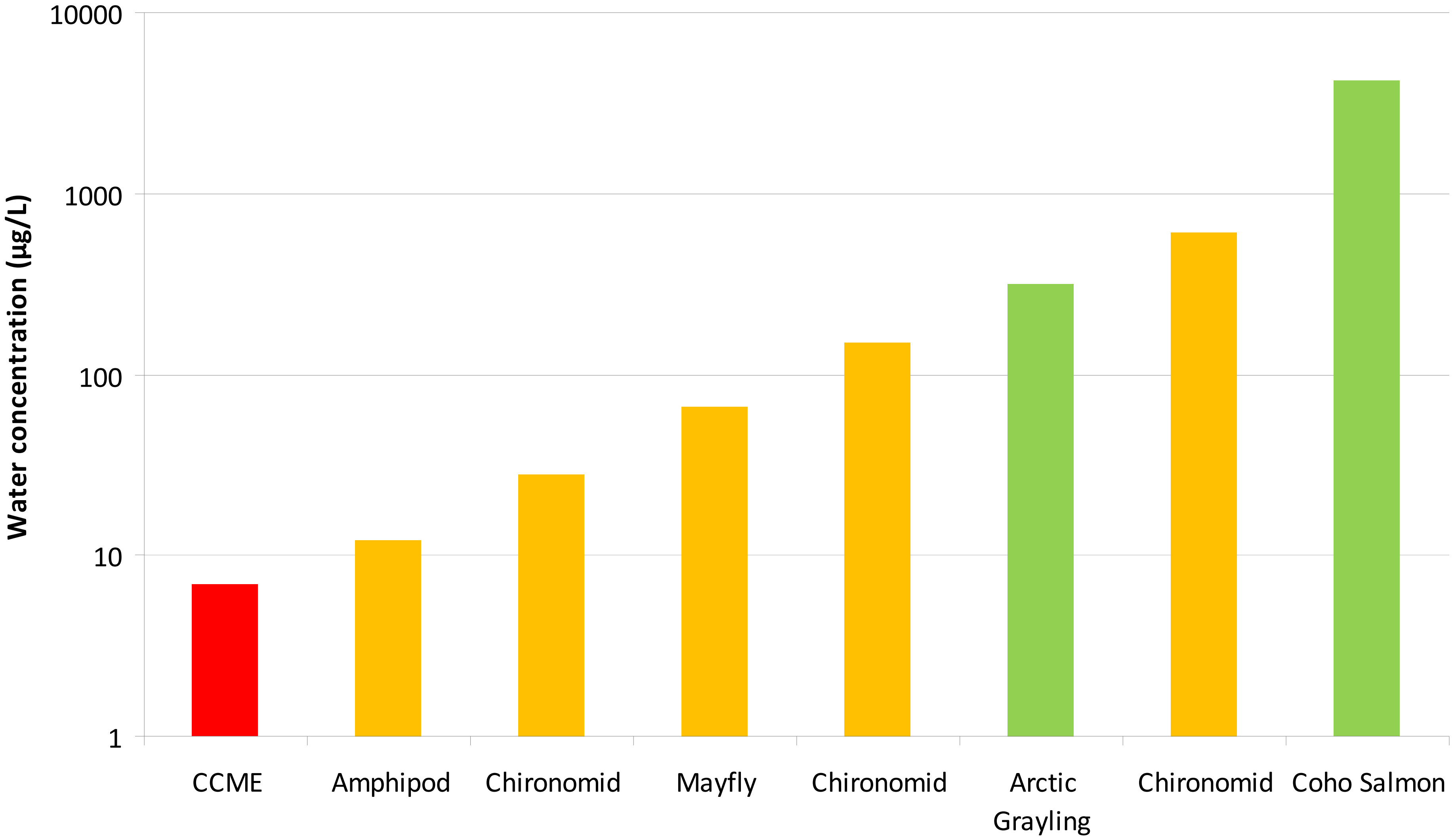
Cadmium Toxicity Data

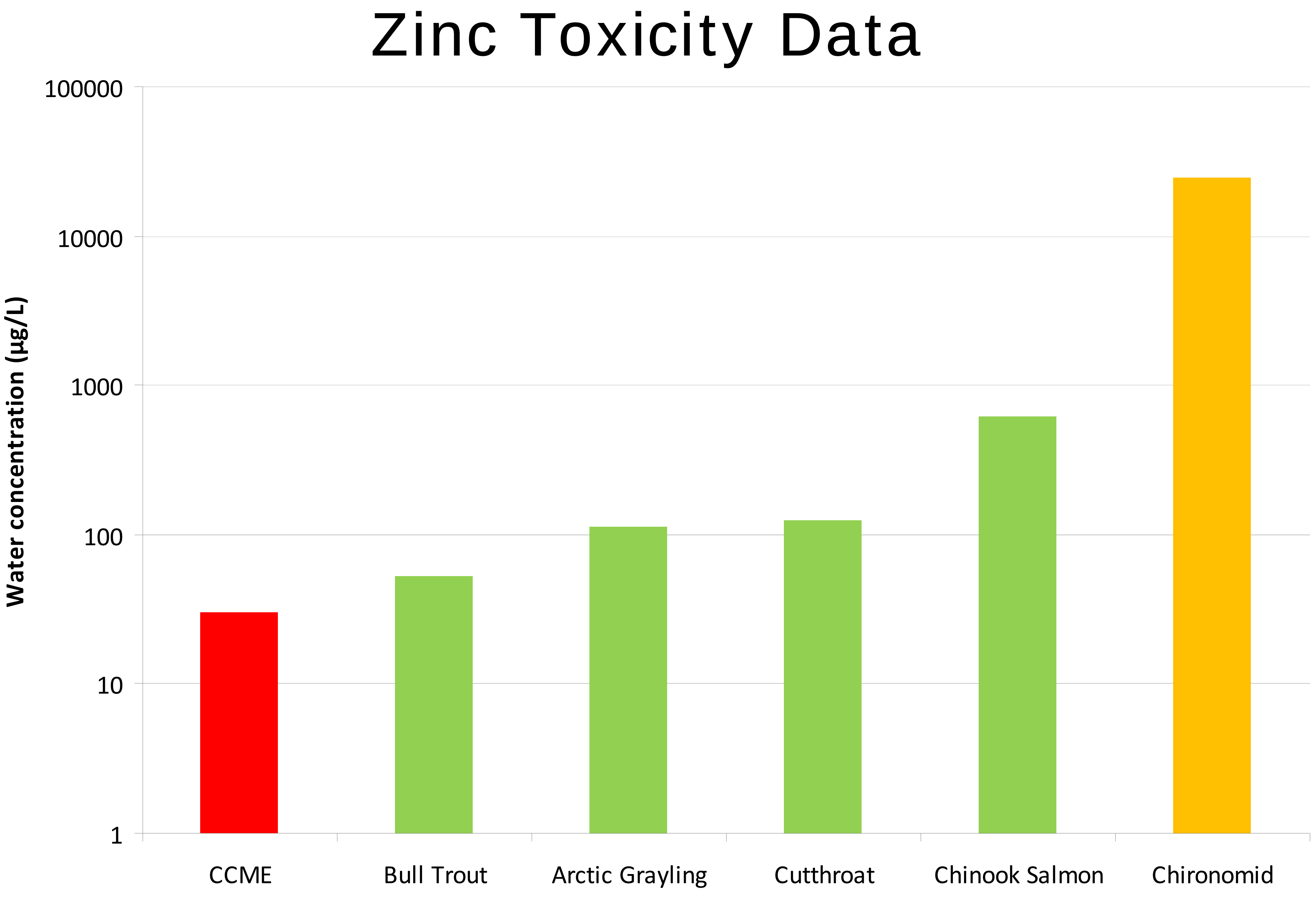


Copper Toxicity Data

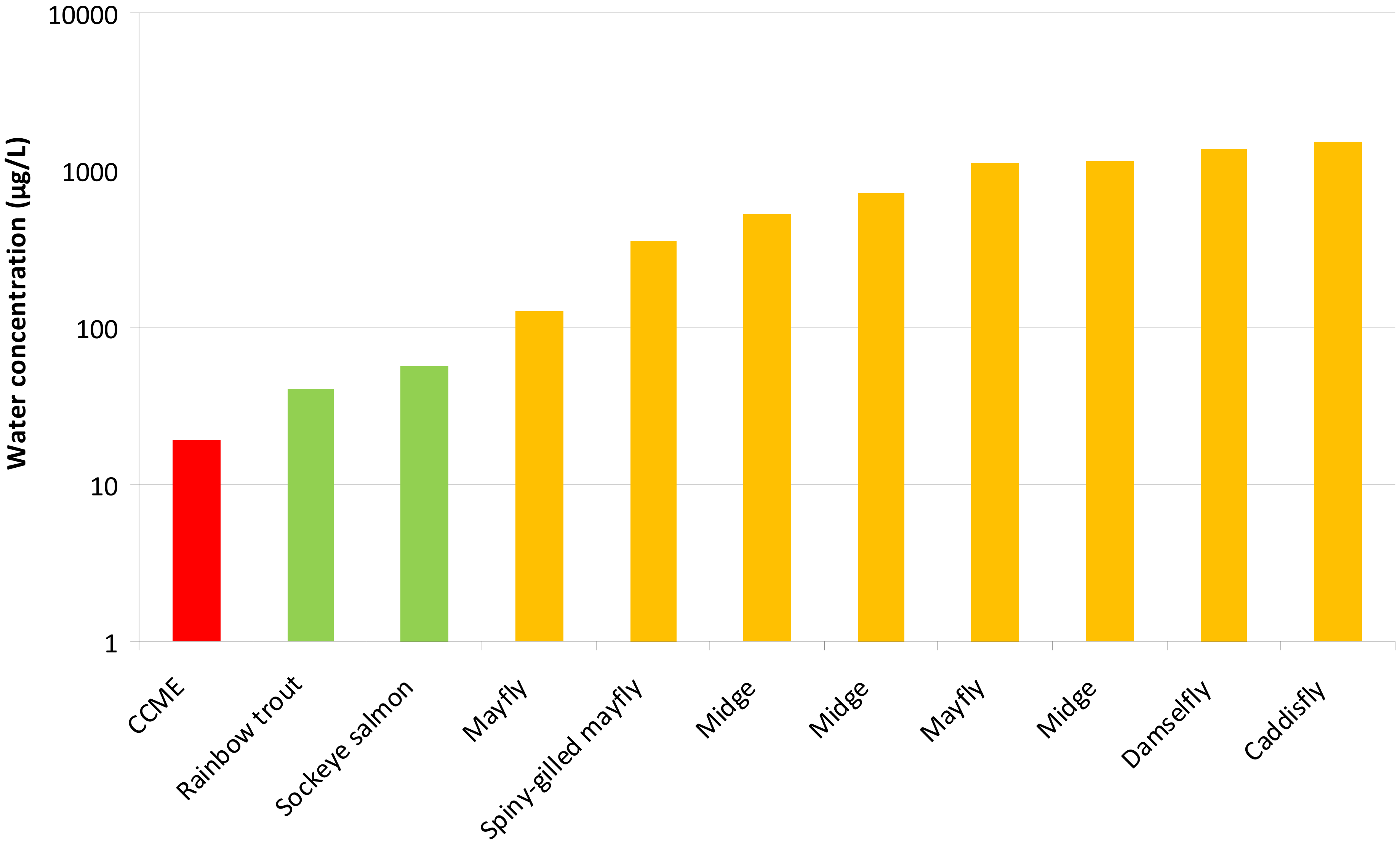


Lead Toxicity Data

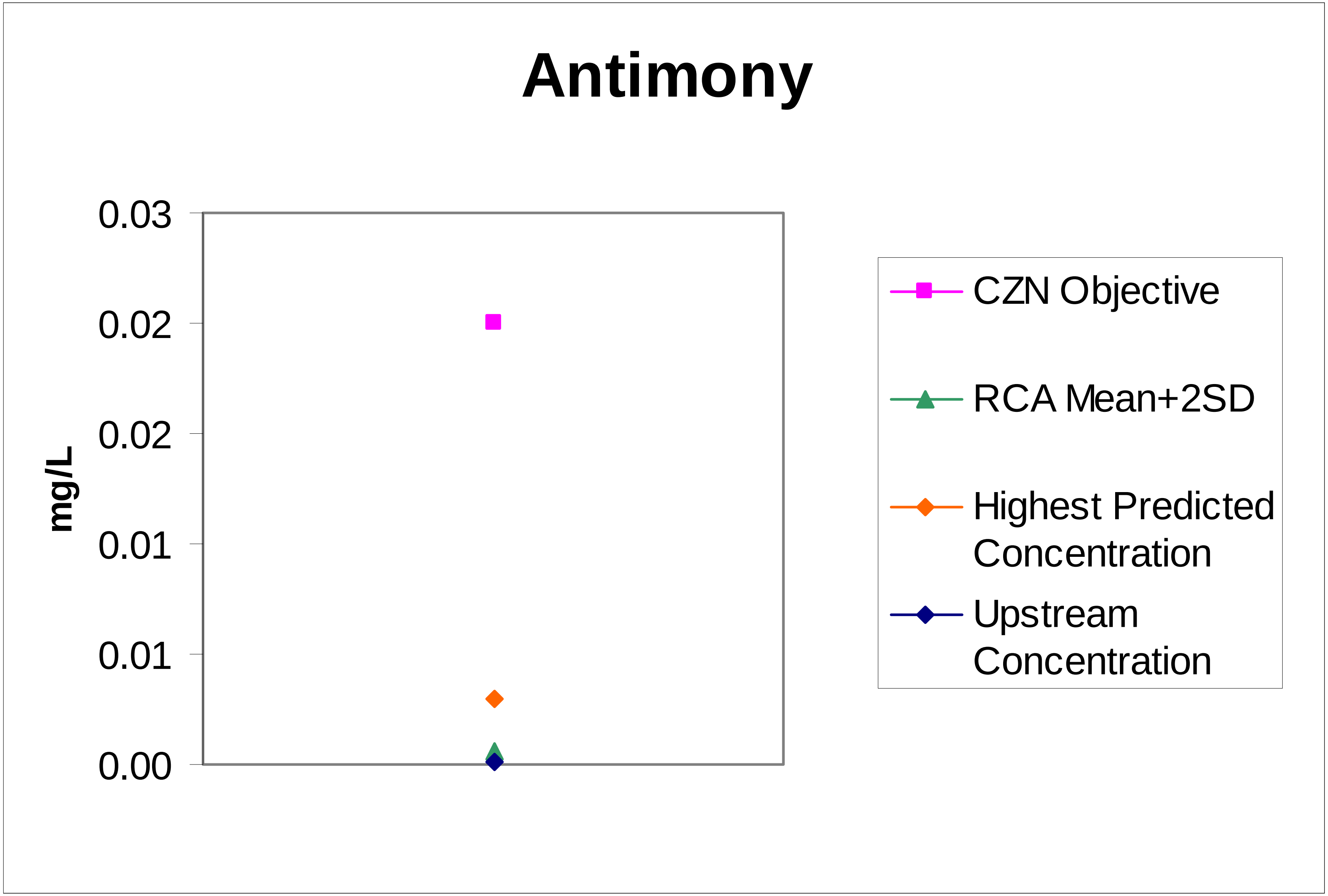



Zinc Toxicity Data
Water concentration (µg/L)
100000
10000
1000
100
10
1
CCME
Bull Trout
Arctic Grayling
Cutthroat
Chinook Salmon
Chironomid

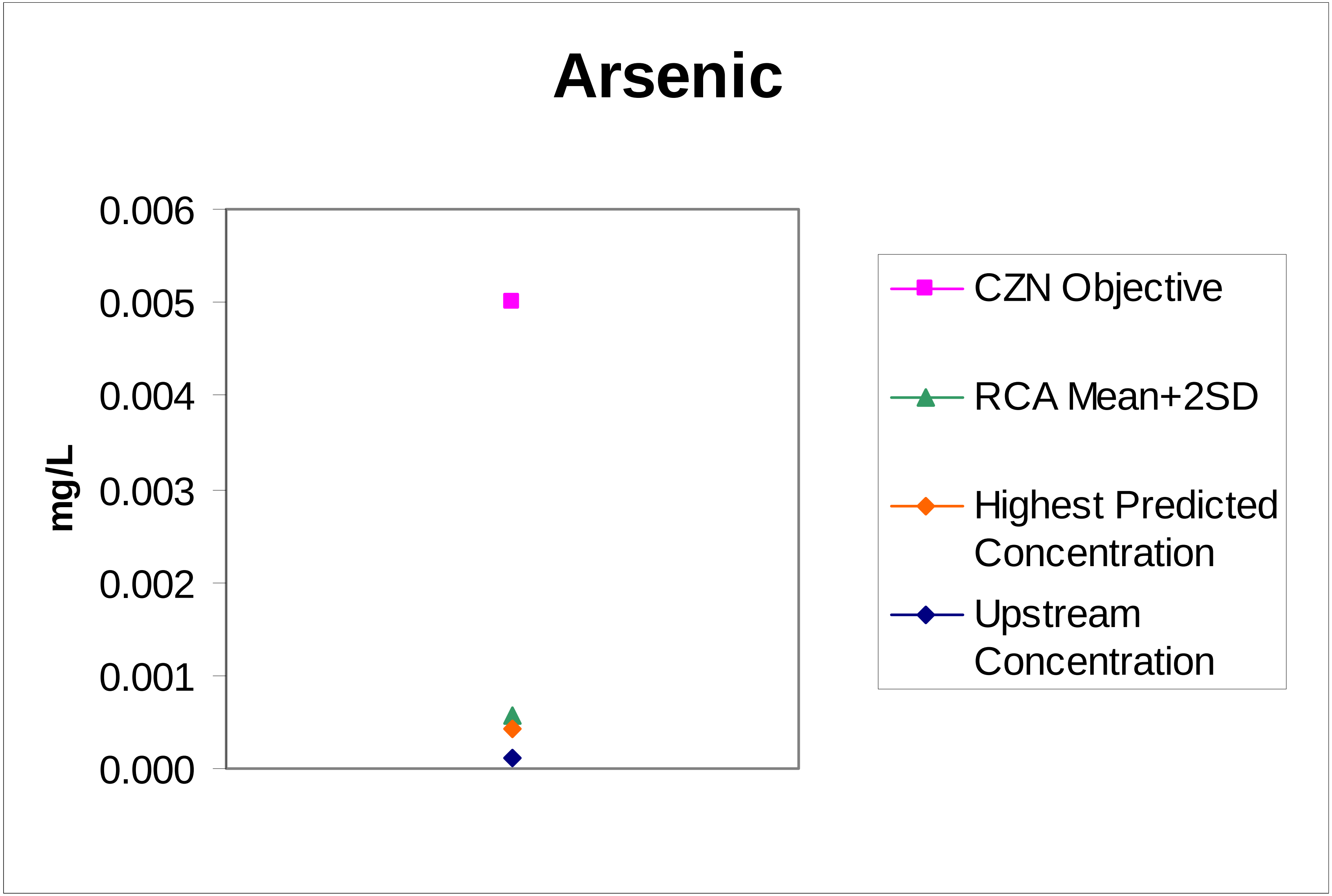
Ammonia Toxicity Data



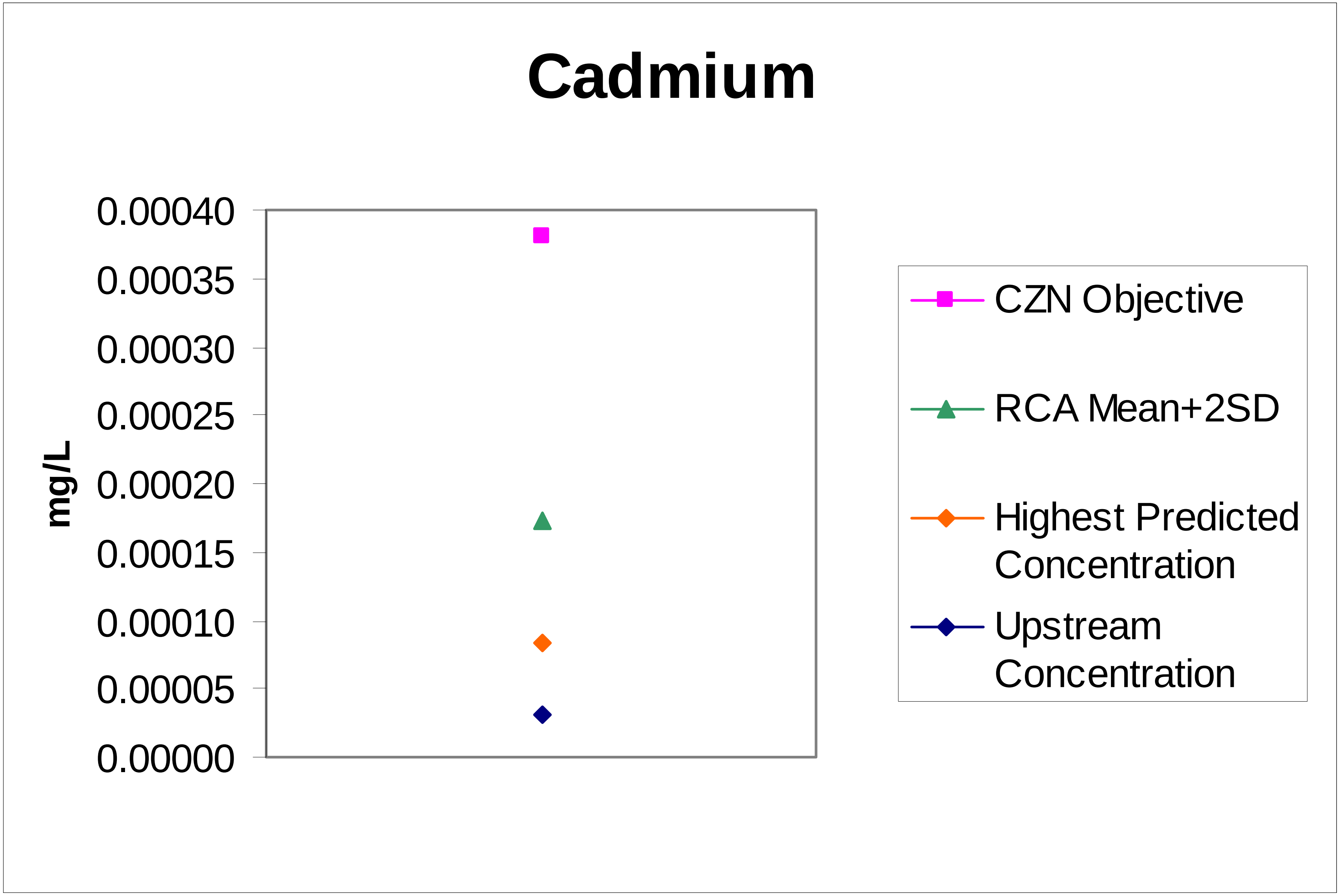
Water Quality Objective



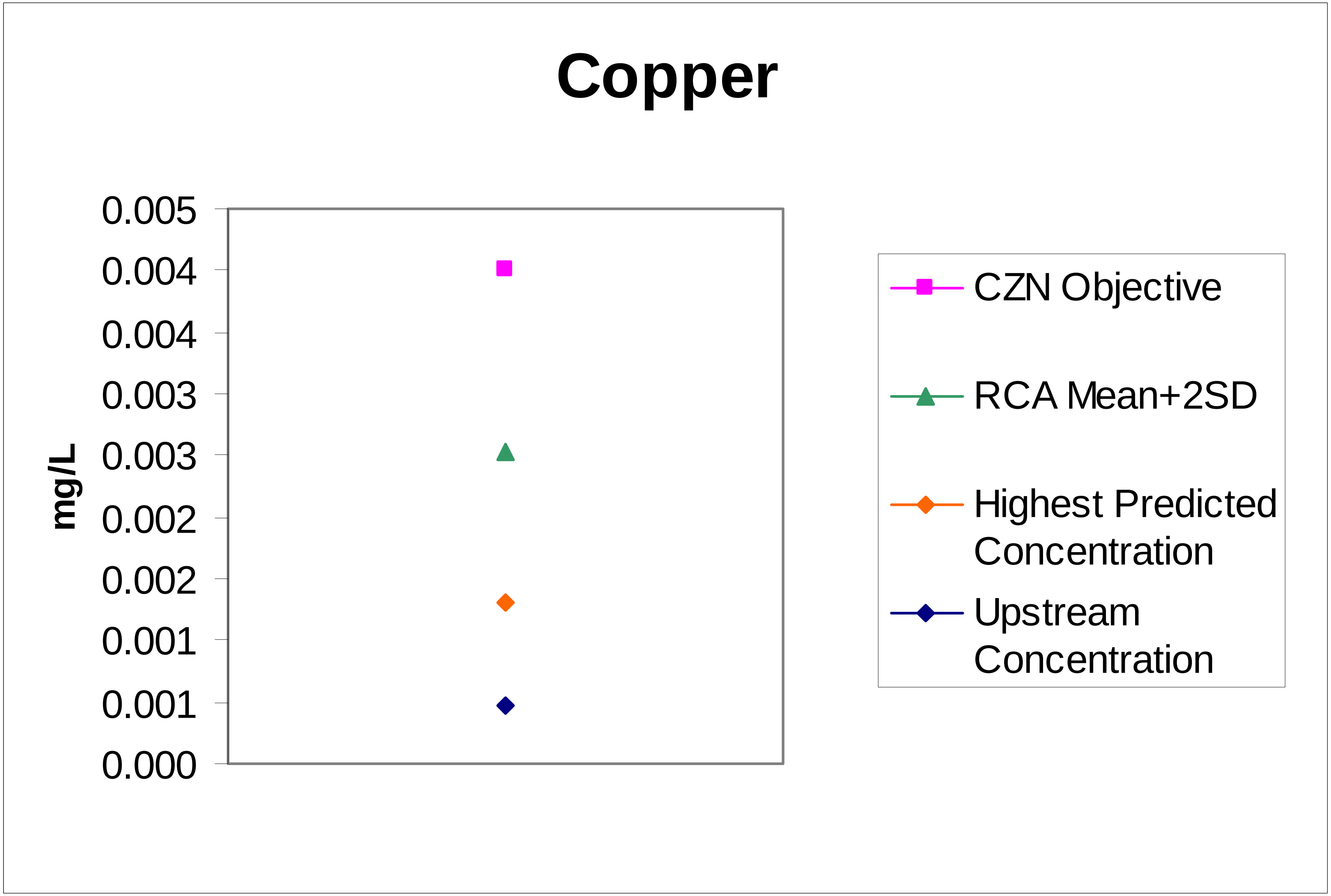
Water Quality Objective



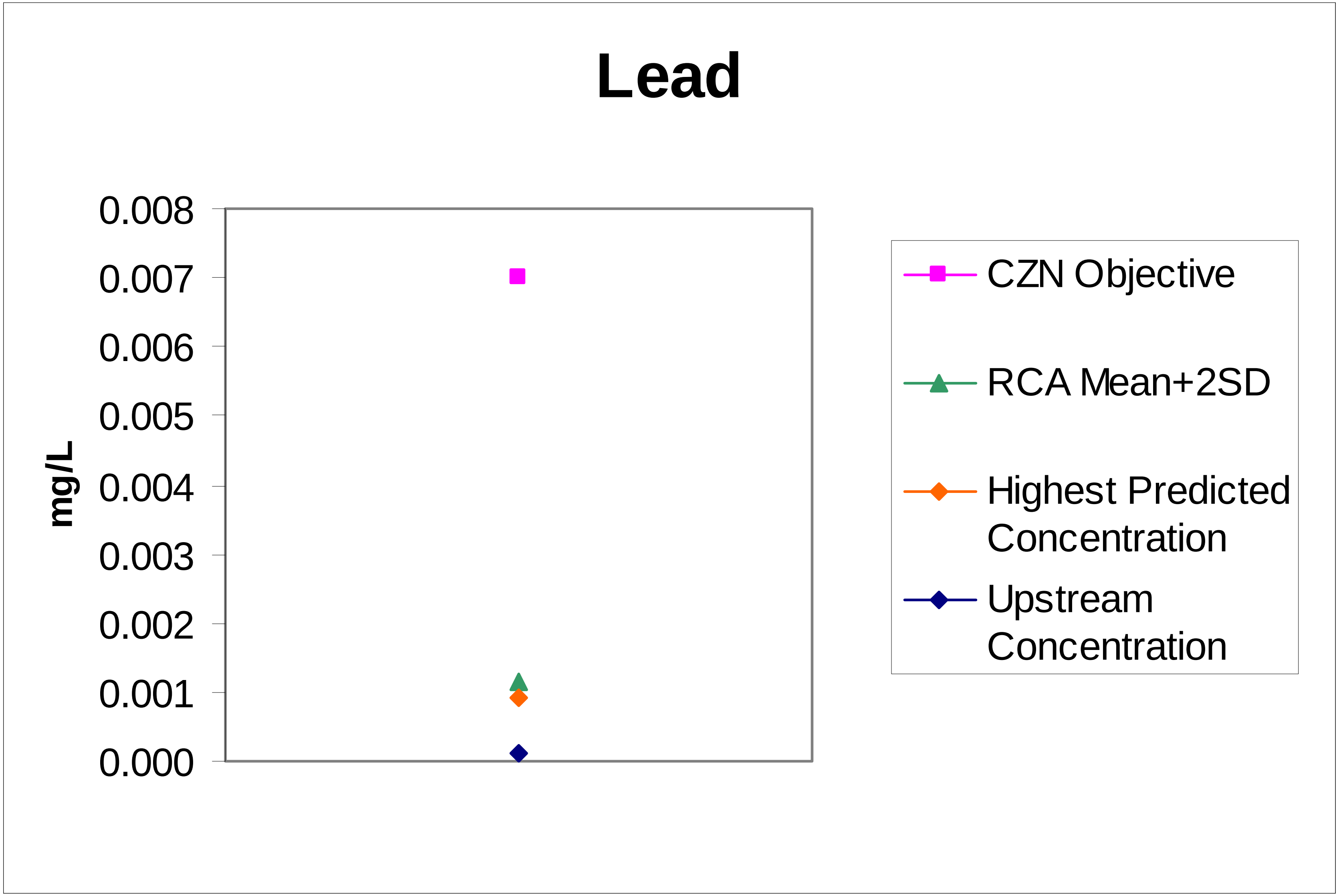
Water Quality Objective



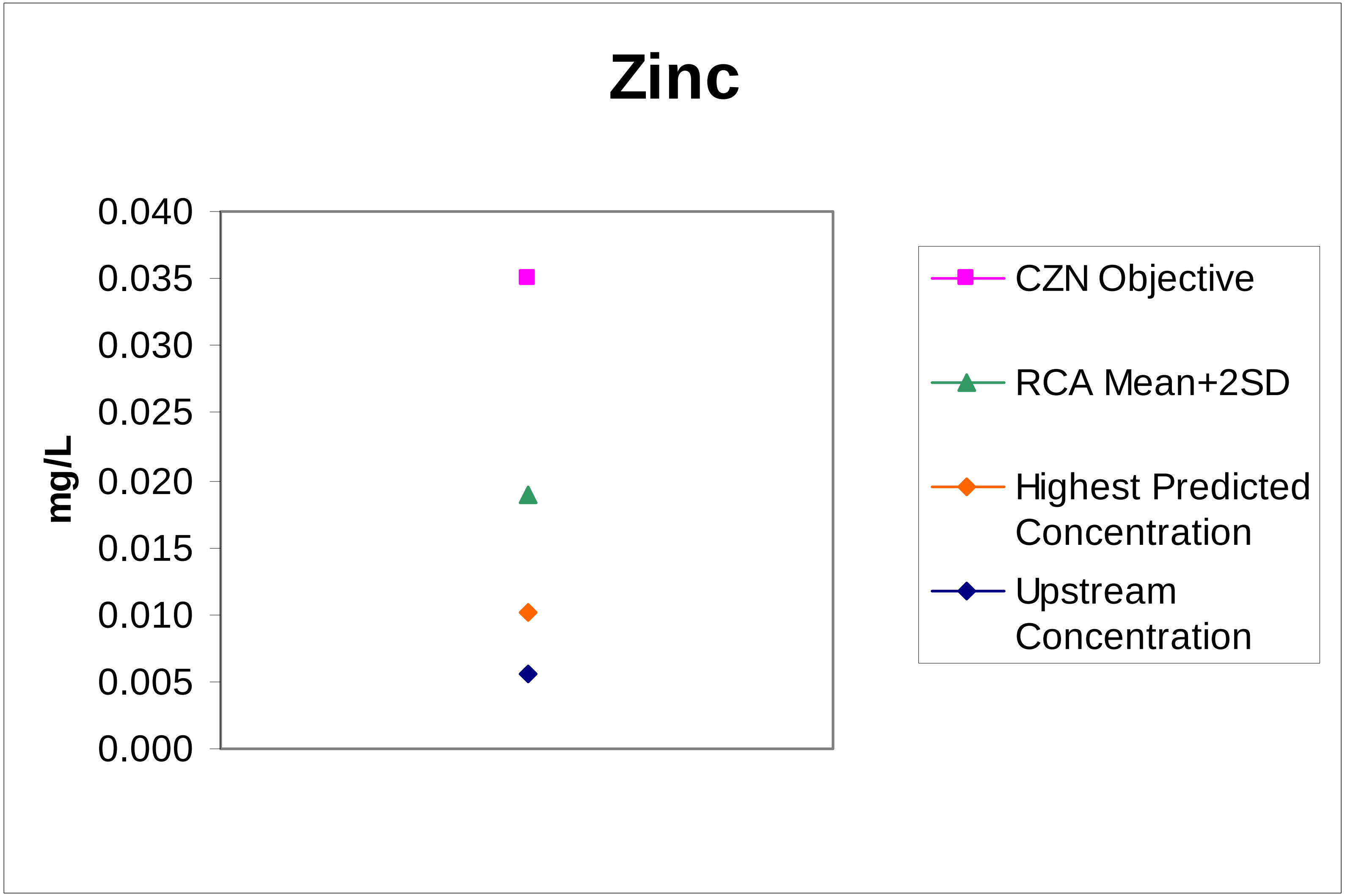
Water Quality Objective



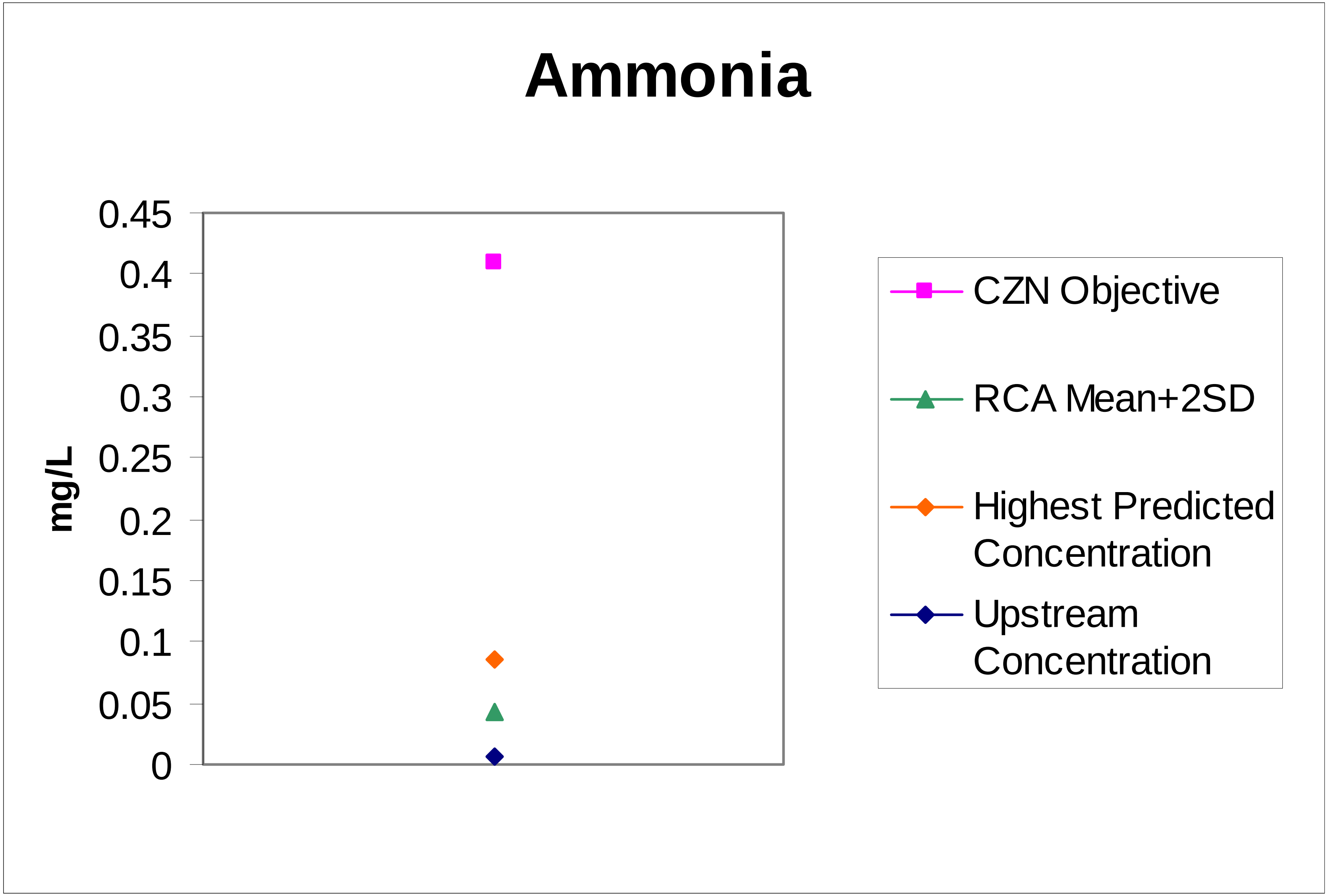
Water Quality Objective



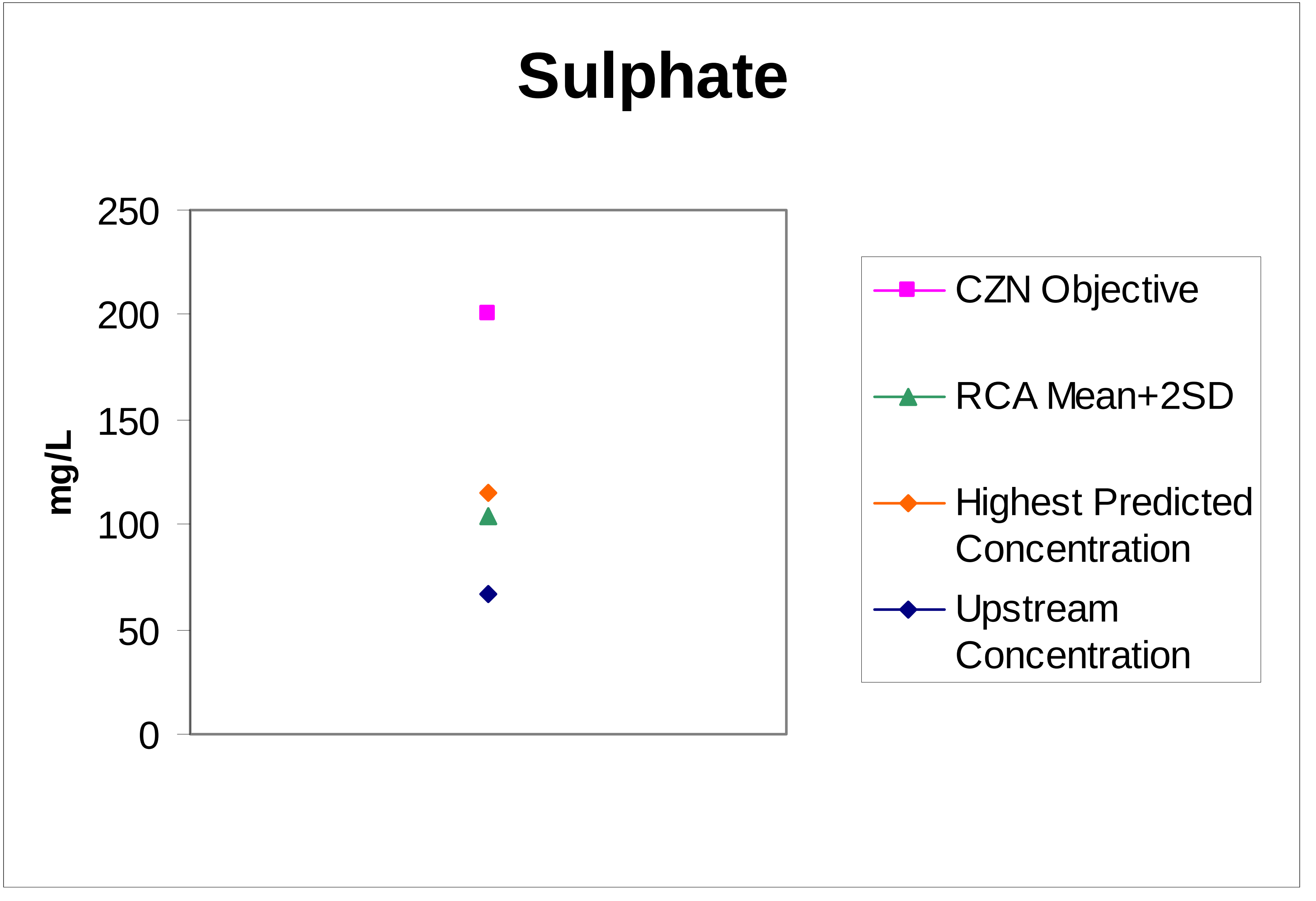
Water Quality Objective



Water Quality Objective



Water Quality Objective



Mercury

- Background concentration in Prairie Creek is vry low
- Similarly very low concentration in mine water
- Majority of mercury in process water is sediment (dissolved is 15% of total)
- Water quality after discharge will be very close to background levels
- Mine operations will not lead to a significant increase in accumulation in fish

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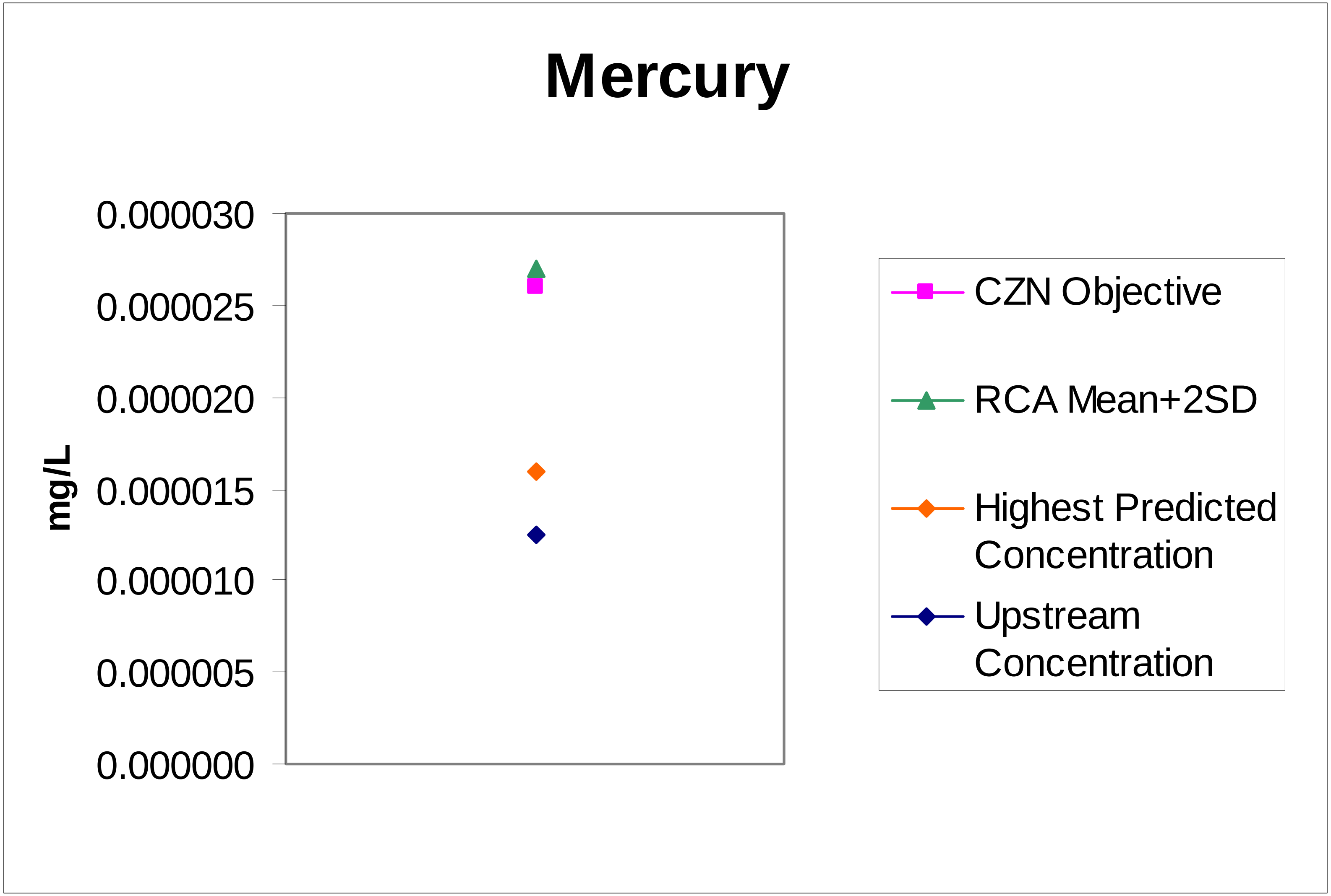
Water Quality Objective



SUMMARY OF PRAIRIE CREEK EXISTING AND PREDICTED WATER QUALITY - OPERATIONS (mg/L)

	Prairie Creek upstream*	CZN Objective	Treated Mine Water	Treated Process Water	Predicted In-Stream Concentrations at Harrison Creek Low to High Mine Flows					
					Mean Creek Flow		Low Creek Flow		High Creek Flow	
					Low	High	Low	High	Low	High
Ag	0.00074	0.0001	<0.00002	0.0007	-	-	-	-	-	-
As	0.00012	0.005	0.0028	0.009	0.00013	0.00020	0.00014	0.00042	0.00012	0.00017
Cd	0.000031	0.00038	0.00004	0.0243	0.000031	0.000076	0.000031	0.000084	0.000031	0.000065
Cu	0.00047	0.004	0.0072	0.071	0.00051	0.00075	0.00057	0.00130	0.00049	0.00067
Fe	0.036	0.163	0.021	5.4	0.036	0.046	0.034	0.046	0.036	0.043
Hg	0.000013	0.000026	<0.00002	0.0019	0.000012	0.000016	0.000012	0.000016	0.000012	0.000015
Pb	0.00011	0.007	0.0017	0.304	0.00011	0.00071	0.00018	0.00090	0.00011	0.00011
Sb	0.00010	0.02[1]	0.0253	0.119	0.00023	0.00089	0.00030	0.00298	0.00015	0.00064
Se	0.00116	0.00208	0.0033	0.039	0.00119	0.00128	0.00123	0.00147	0.00117	0.00124
Zn	0.0055	0.035	0.017	1.35	0.0056	0.0083	0.0060	0.0101	0.0056	0.0076
NH^3 N	0.0068	0.409	0.69[2]	0.29	0.008	0.023	0.009	0.085	0.007	0.018
NO^3 N	0.244	2.9	5.354[2]	<2	0.255	0.365	0.261	0.828	0.248	0.322
NO^2 N	0.08	0.06	0.013[2]	<0.5	-	-	-	-	-	-
Tot. P	0.0026	0.004	0.0033[3]	0.230	0.0026	0.0030	0.0026	0.0031	0.0026	0.0029
SO^4	67.0	200	470	4500	69.1	84.1	72.9	115.7	67.9	79.3
TDS	263.7	356.7	700	6100	265.9	284.1	271.3	319.8	264.7	278.5

* Means from existing database, non-detections for each parameter assigned a value half the lowest detection limit

Bold = Exceeds Objective ID = Insufficient Data ND = No Data

1 Ontario guideline 2 Diavik underground water 3 Factored from Diavik STP

SUMMARY OF PRAIRIE CREEK EXISTING AND PREDICTED WATER QUALITY - OPERATIONS (mg/L)

	Prairie Creek		RCA (Mean+2SD)*		CZN Objective	Treated Mine Water	Treated Process Water	Predicted In-Stream Concentrations at Harrison Creek Low to High Mine Flows					
								Mean Creek Flow		Low Creek Flow		High Creek Flow	
	Up-stream*	Down-stream#	Value	%<DL				Low	High	Low	High	Low	High
Ag	0.00074	0.000002	0.00229	87	0.0001	<0.00002	0.0007	-	-	-	-	-	-
As	0.00012	**0.00038**	0.00028	30	0.005	0.0028	0.009	0.00013	0.00020	0.00014	**0.00042**	0.00012	0.00017
Cd	0.000031	0.000039	0.000086	26	0.00038	0.00004	0.0243	0.000031	0.000076	0.000031	0.000084	0.000031	0.000065
Cu	0.00047	0.00035	0.00243	20	0.004	0.0072	0.071	0.00051	0.00075	0.00057	0.00130	0.00049	0.00067
Fe	0.036	0.061	0.163	0	0.163	0.021	5.4	0.036	0.046	0.034	0.046	0.036	0.043
Hg	0.000013	ND	0.000027	88	0.000026	<0.00002	0.0019	0.000012	0.000016	0.000012	0.000016	0.000012	0.000015
Pb	0.00011	0.00016	0.00090	39	0.007	0.0017	0.304	0.00011	0.00071	0.00018	0.00090	0.00011	0.00011
Sb	0.00010	**0.00024**	0.00019	40	0.02[1]	0.0253	0.119	**0.00023**	**0.00089**	**0.00030**	**0.00298**	0.00015	**0.00064**
Se	0.00116	0.00124	0.00208	11	0.00208	0.0033	0.039	0.00119	0.00128	0.00123	0.00147	0.00117	0.00124
Zn	0.0055	0.0163	0.0190	11	0.035	0.017	1.35	0.0056	0.0083	0.0060	0.0101	0.0056	0.0076
NH^3 N	0.0068	0.0123	0.0419	65	0.409	0.69[2]	0.29	0.008	0.023	0.009	**0.085**	0.007	0.018
NO^3 N	0.244	ID	0.903	0	2.9	5.354[2]	<2	0.255	0.365	0.261	0.828	0.248	0.322
NO^2 N	0.08	ID	1.03	79	0.06	0.013[2]	<0.5	-	-	-	-	-	-
Tot. P	0.0026	**0.0104**	0.0092	58	0.004	0.0033[3]	0.230	0.0026	0.0030	0.0026	0.0031	0.0026	0.0029
SO^4	67.0	73.9	103.5	0	200	470	4500	69.1	84.1	72.9	**115.7**	67.9	79.3
TDS	263.7	286.9	356.7	0	356.7	700	6100	265.9	284.1	271.3	319.8	264.7	278.5

* Means from existing database, non-detections for each parameter assigned a value half the lowest detection limit **Bold = Exceeds RCA**

\# Old NNPR boundary, means from existing EC database, non-detections for each parameter assigned a value half the lowest detection limit

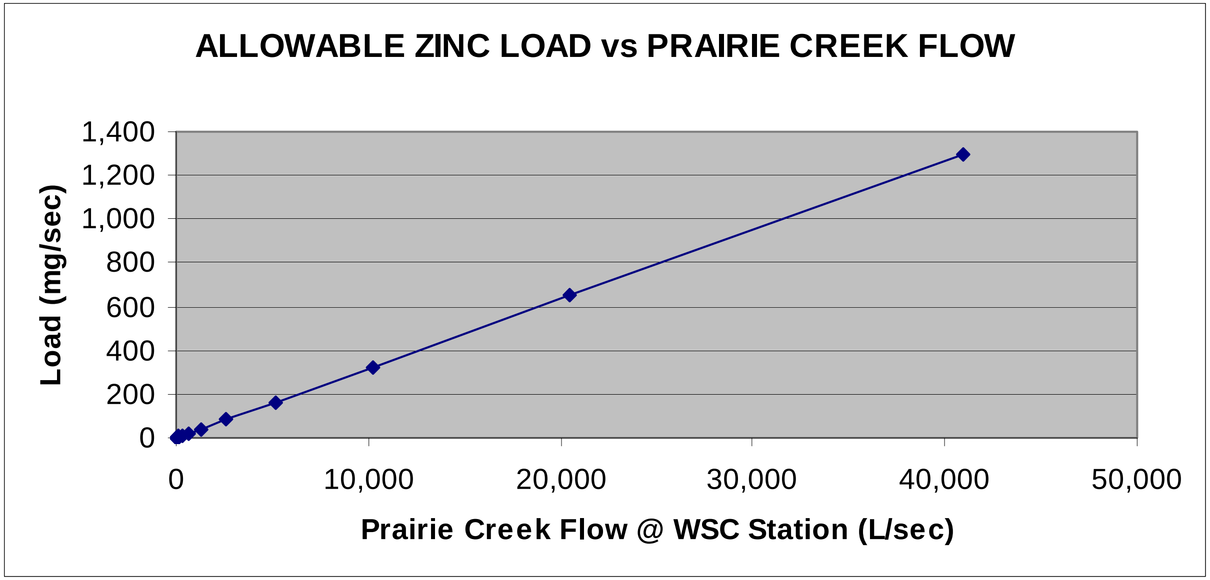
ID = Insufficient Data ND = No Data 1 Ontario guideline 2 Diavik underground water 3 Factored from Diavik STP

Effluent Quality Criteria

- Maximum grab and average limits should cap discharge concentrations so that objectives are met during higher than normal flows
- Load limits that vary according to Prairie Creek flows should be set to ensure objectives are met for all flows
- This approach ensures significant effects do not occur, but gives the operation maximum flexibility

Load Limits

- Continuous creek flow readings
- Pre-determined upstream and objective concentrations
- Compute discharge load limits
- Track discharge loads based on continuous flow readings and discharge concentrations



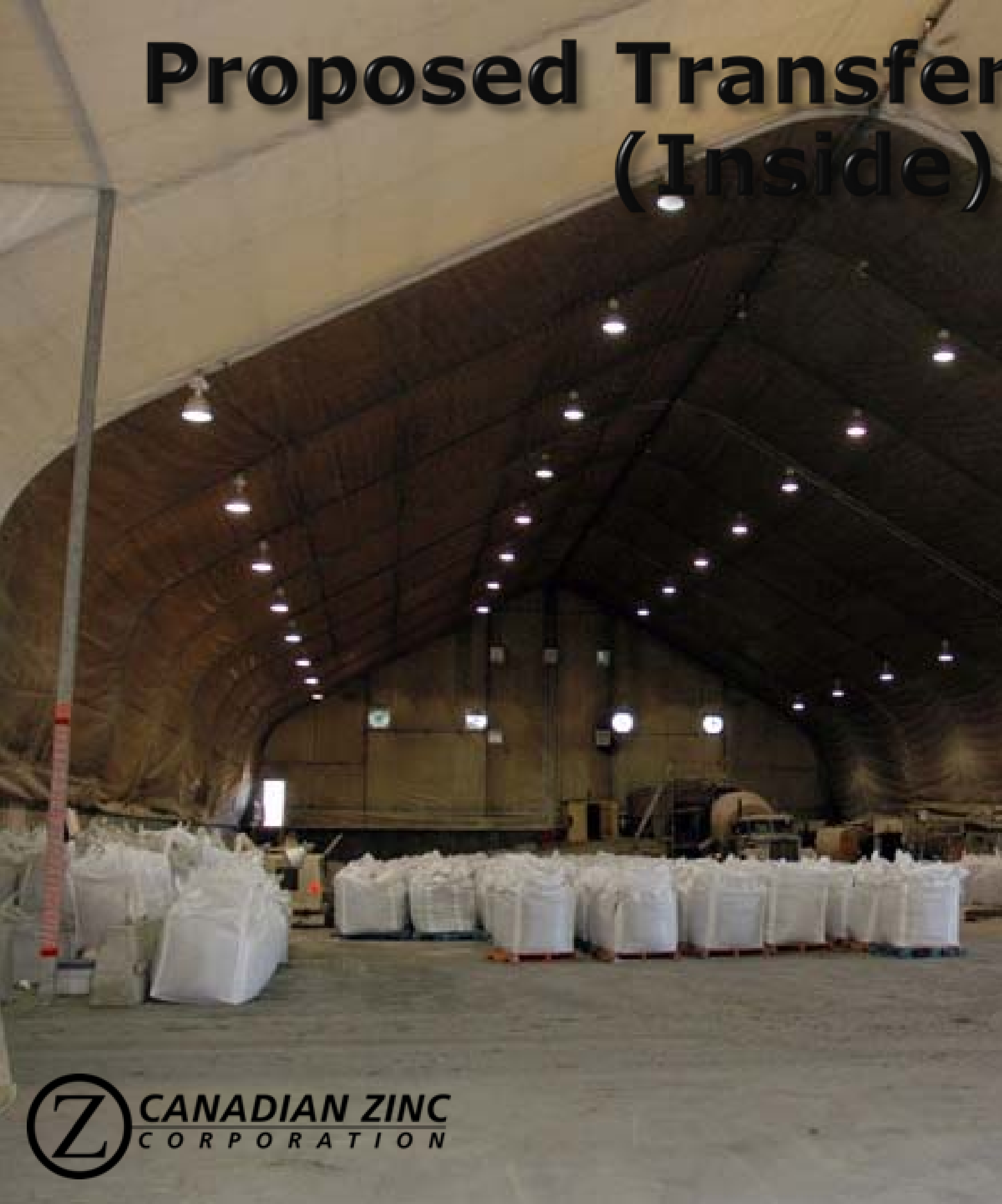
Manpower and Logistics

- 220 full-time jobs at the Mine, 110 at any one time
- 2 mine and mill shifts, 1 admin shift, per day
- 3 weeks on, 3 weeks off rotation by air, weekly flights
- Concentrates/supplies haul to/from Mine during December-April

Concentrates

- Placed in sealed 3 tonne bags, dust control, stored for winter haul
- Collected by trucks from bay with wheel wash
- Bags and contents will be frozen
- Off-load/load at transfer facilities makes bulk transport impossible
- Dust and soil monitoring to verify no losses

Proposed Transfer Facilities (Inside)



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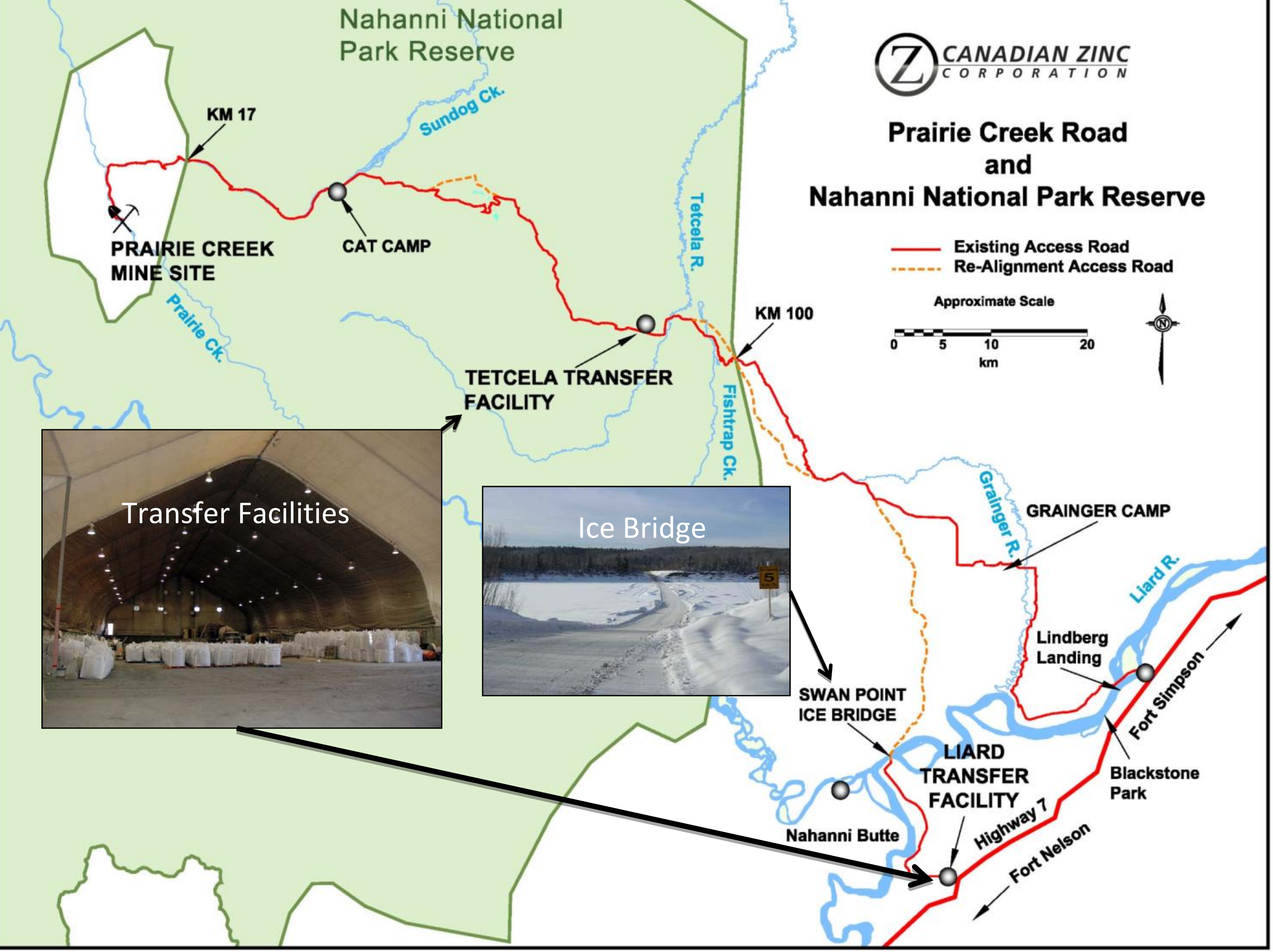
Prairie Creek Mine: Transport


CANADIAN ZINC CORPORATION
Prairie Creek Road and Nahanni National Park Reserve
Existing Access Road
Re-Alignment Access Road
Approximate Scale
0 5 10 20
km
N
Nahanni National Park Reserve
KM 17
Sundog Ck.
PRAIRIE CREEK MINE SITE
CAT CAMP
Tetcela R.
Prairie Ck.
KM 100
TETCELA TRANSFER FACILITY
Fishtrap Ck.
Grainger R.
GRAINGER CAMP
Liard R.
Lindberg Landing
Transfer Facilities
Ice Bridge
5
SWAN POINT ICE BRIDGE
LIARD TRANSFER FACILITY
Nahanni Butte
Highway 7
Fort Simpson
Blackstone Park
Fort Nelson

Road Design/ Changes

- Re-alignments out of wetlands
- Avoid poljes & karst features
- Reduce/remove grades/turns
- Bridges over some creeks
- Curbs, run-away lanes
- Speed limit and warning signs

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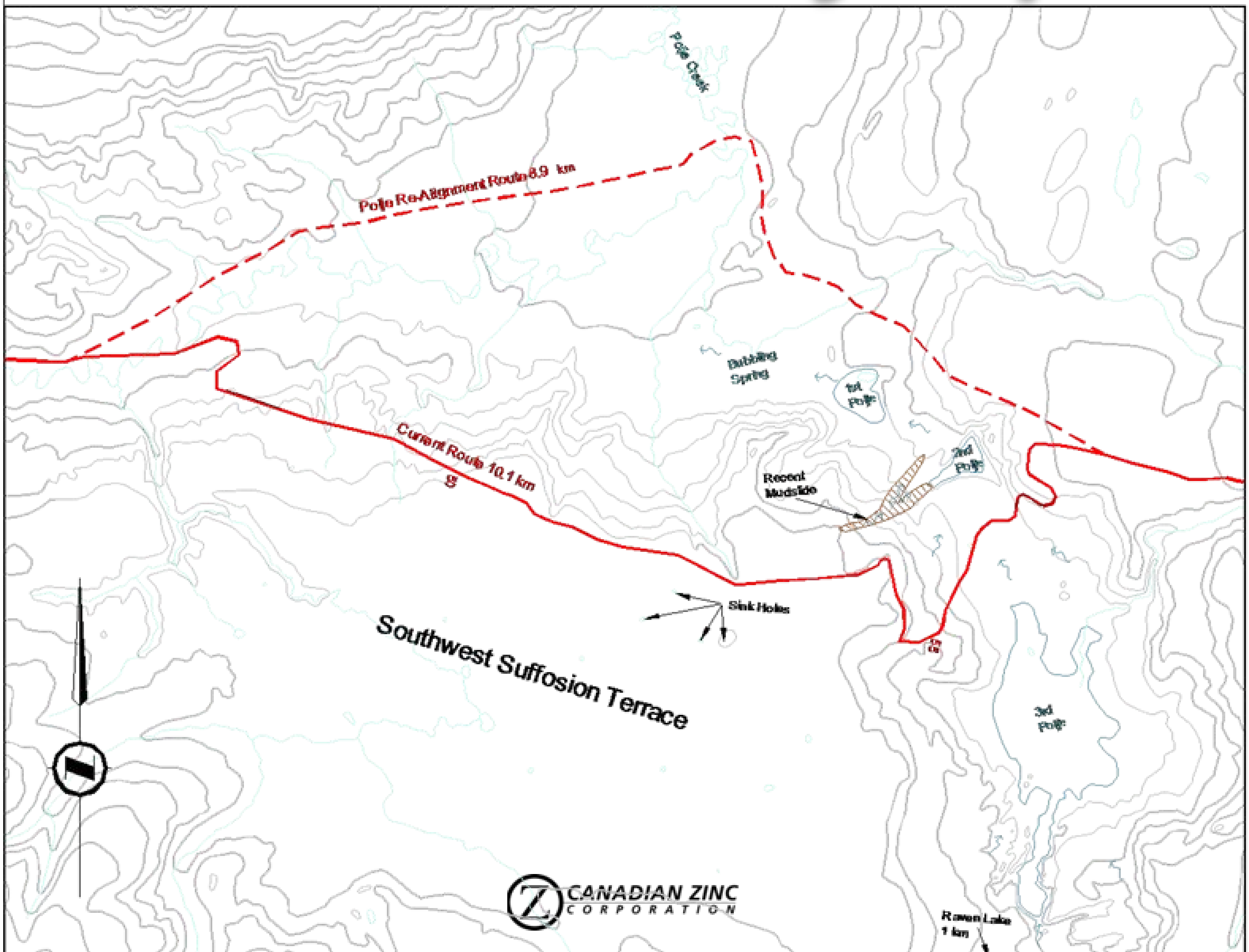
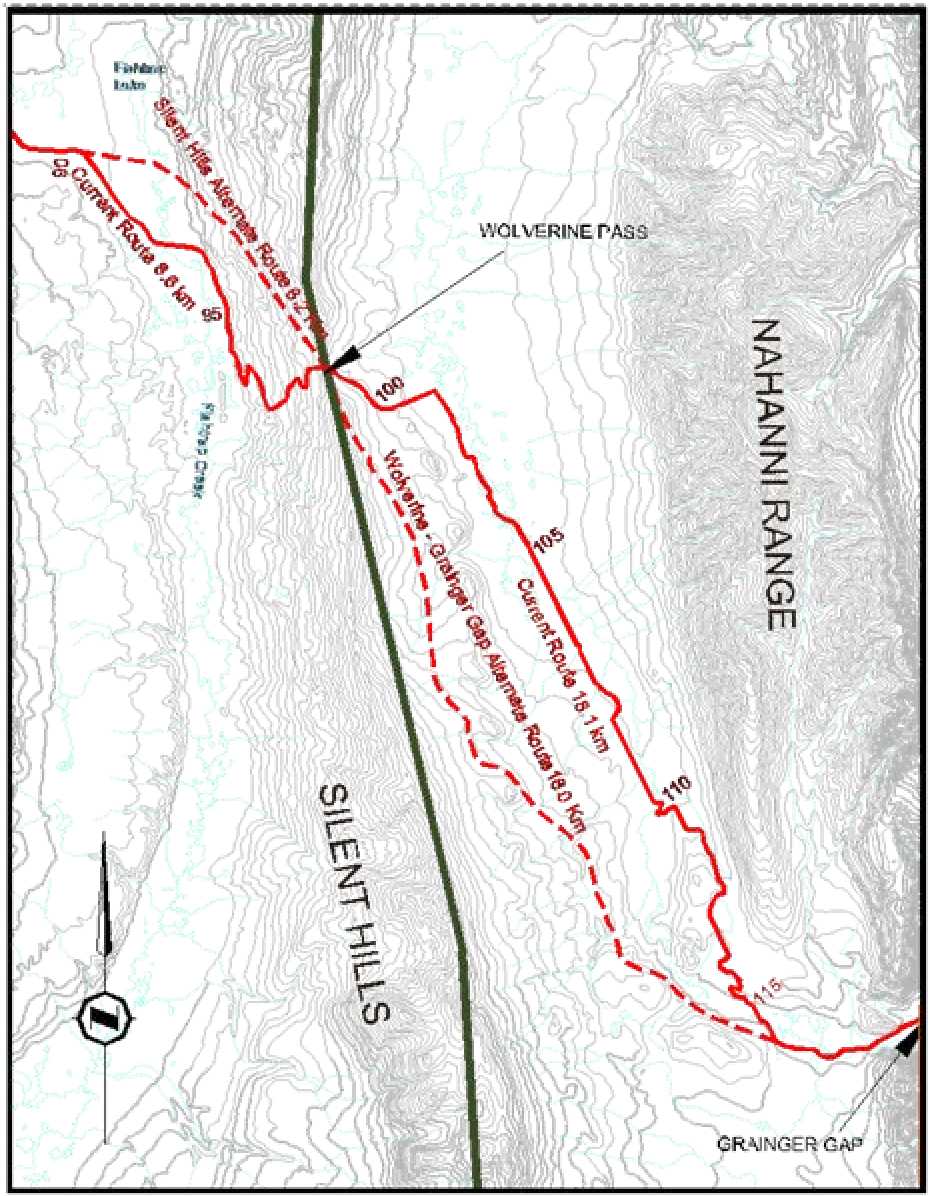
Bridge Concept - Sundog Creek

Access Road – Polje By-Pass



Access Road – Silent Hills



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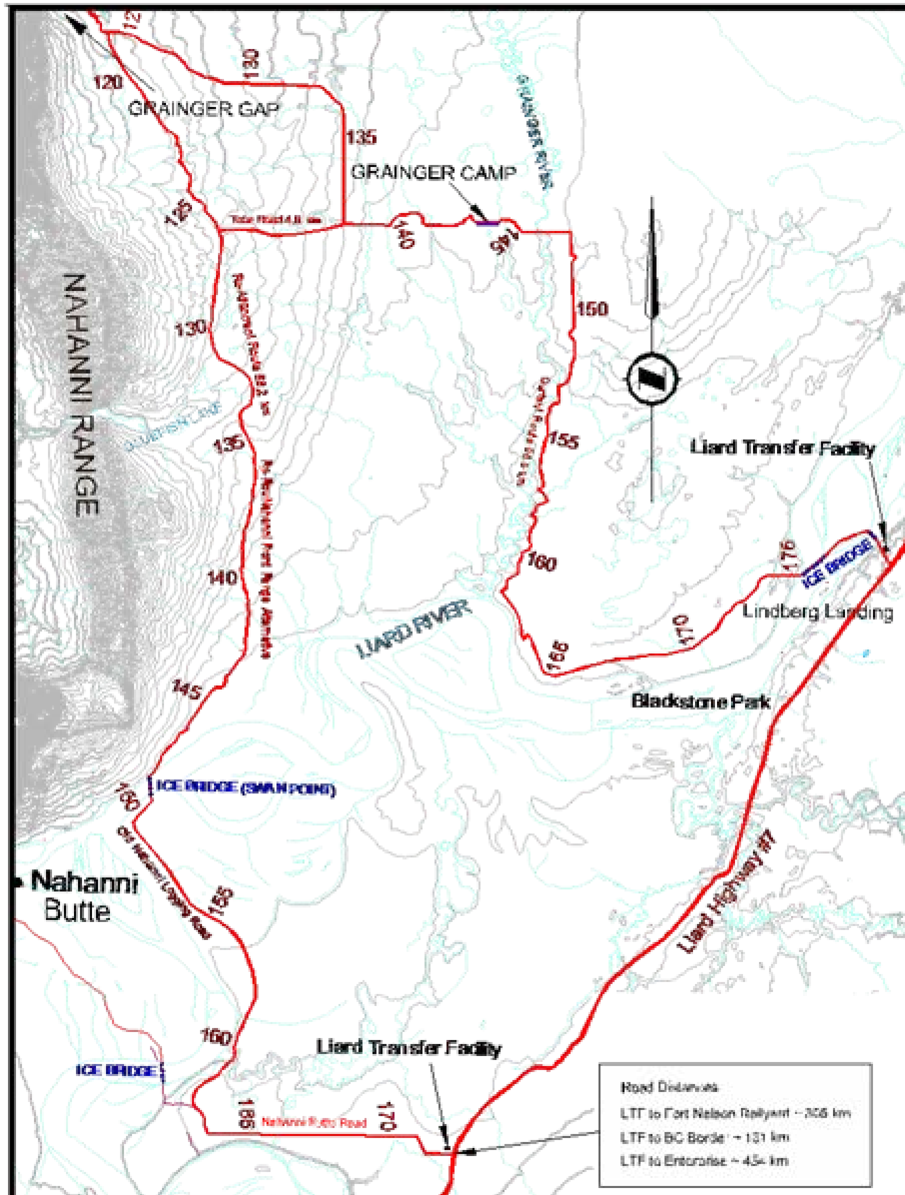
Access Road – Nahanni Range



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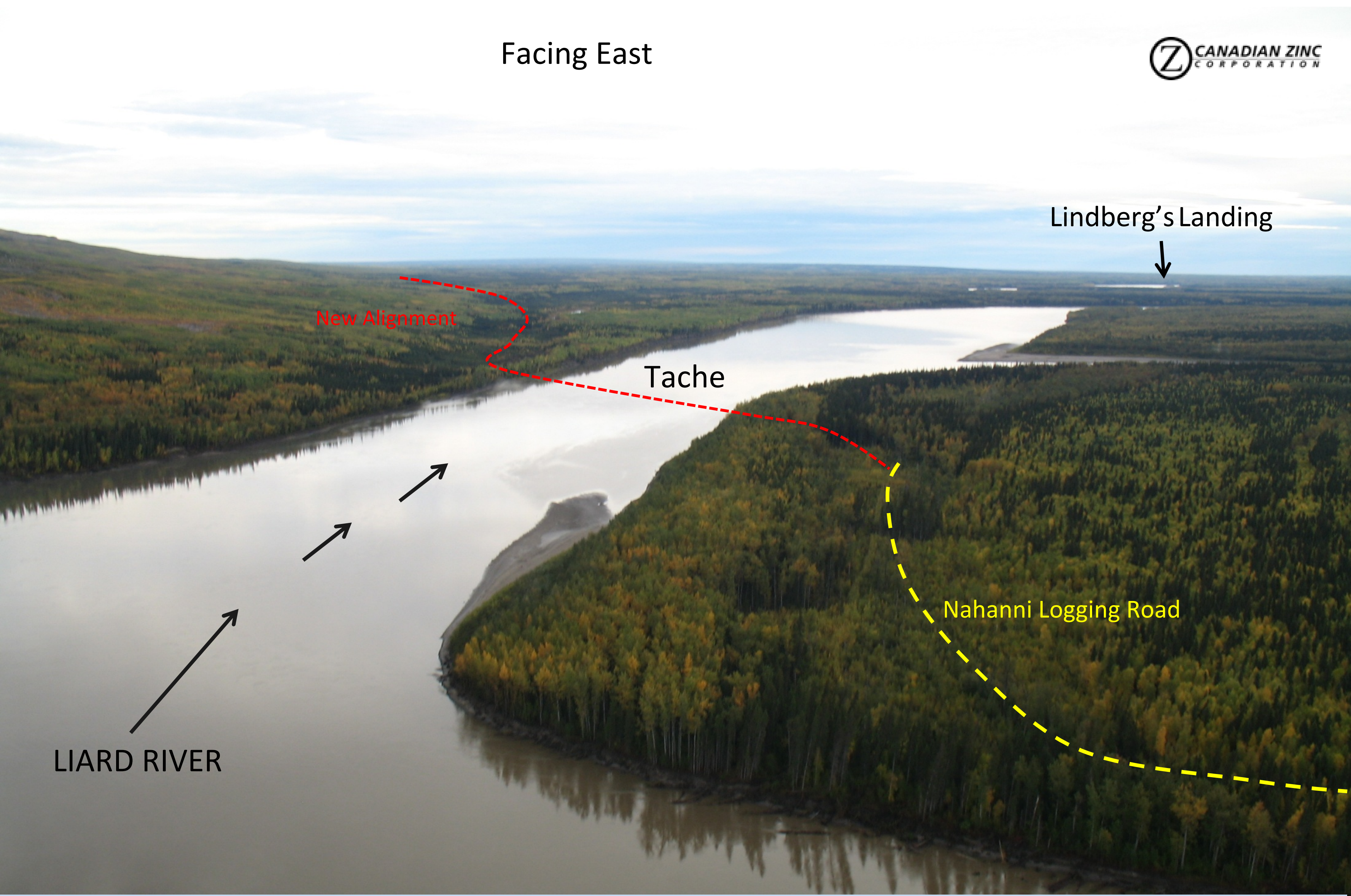

The Nahanni Route Re-alignment and Liard Crossing: Location of Ice Bridge during winter operations

Road Construction & Maintenance

- Start from the Mine, November
- Use of frozen ground, snow/ice
- Inspect for cultural resources
- Water from Mine well or Mosquito Lake
- Protect stream banks
- Granular fill use, insulate permafrost
- Inspections/maintenance/closure

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Road Use Schedule

- Dec 1 to Jan 15 – Mine to Tetcela - Concentrates to Tetcela Transfer Facility (TTF)
- Jan 15 to Mar 31 – Mine and TTF to Liard - Concentrates to Liard Transfer Facility, Supplies in to Mine
- Jan 15 to fall – Liard Transfer Facility to Fort Nelson - Concentrates to railhead
- All dates subject to weather

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Road Management

- Verify driver experience
- Speed limits
- Radio contact and control
- Journey management and checkpoints
- Supervision and monitoring

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Spill Contingency

- Response plans and response team
- Response training
- Response equipment and control points
- Driver training relevant to cargo
- Rapid response and notifications
- Complete spill clean-up verified by investigation

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Access Control

- Nahanni checkpoint to deter unauthorized use
- Information and signs re high traffic road, use at own risk
- Monitoring of use (monitors and truckers)
- Barriers when road not in use

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Expected Liard Facility Transfer Traffic

From	Trips per Day	Period	
		From	To
Mine	58	January 15	March 6
Mine	37	March 6	April 15
Fort Nelson	14	January 15	October 15 *

Dates subject to weather

Wildlife

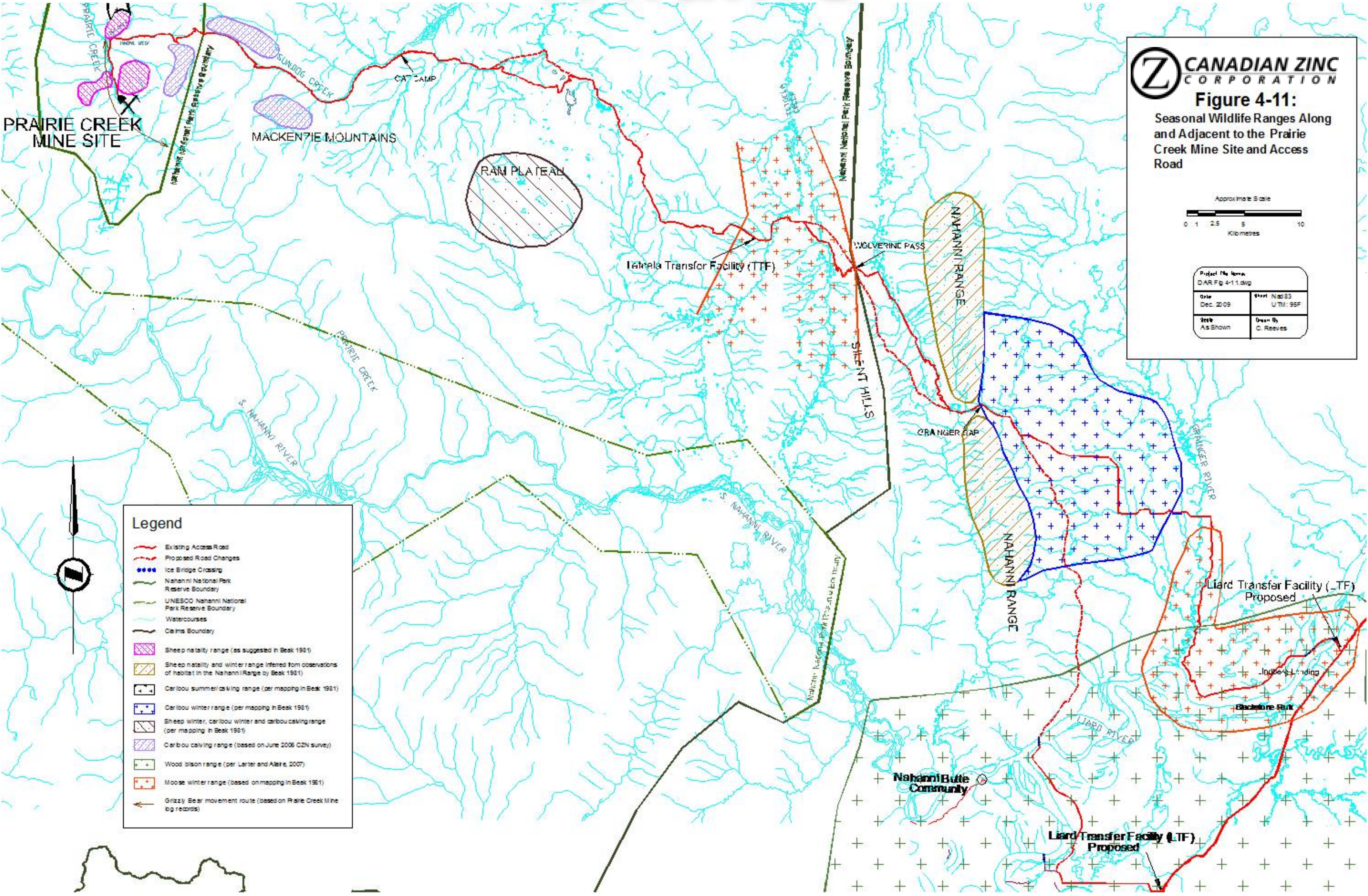
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Figure 4-11:
Seasonal Wildlife Ranges Along and Adjacent to the Prairie Creek Mine Site and Access Road
Approximate Scale
0 1 2.5 5 10
Kilometres
DAR Fig 4-11.dwg
Dec. 2009
Nad 83
UTM: 95F
As Shown
C. Reeves
PRAIRIE CREEK
MINE SITE
MACKENZIE MOUNTAINS
SUNDOG CREEK
CAT CAMP
RAM PLATEAU
Tetcela Transfer Facility (TTF)
WOLVERINE PASS
NAHANNI RANGE
SILENT HILLS
GRANGER GAP
GRANGER RIVER
PRAIRIE CREEK
S. NAHANNI RIVER
Liard Transfer Facility (LTF)
Proposed
Lindberg Landing
Blackstone Park
LIARD RIVER
Nahanni Butte
Community
Legend
Existing Access Road
Proposed Road Changes
Ice Bridge Crossing
Nahanni National Park Reserve Boundary
UNESCO Nahanni National Park Reserve Boundary
Watercourses
Claims Boundary
Sheep natality range (as suggested in Beak 1981)
Sheep natality and winter range inferred from observations of habitat in the Nahanni Range by Beak 1981)
Caribou summer/calving range (per mapping in Beak 1981)
Caribou winter range (per mapping in Beak 1981)
Sheep winter, caribou winter and caribou calving range (per mapping in Beak 1981)
Caribou calving range (based on June 2006 CZN survey)
Wood bison range (per Larter and Allaire, 2007)
Moose winter range (based on mapping in Beak 1981)
Grizzly Bear movement route (based on Prairie Creek Mine log records)

Wildlife

Residual effects:

- Potential for effects on Dall's sheep lambing activity during the spring (May-June) with air traffic;
- Potential for collisions with Dall's sheep, woodland caribou and wood bison associated on access road; and,
- Potential for grizzly bear-human encounters at the Mine site.

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Wildlife Mitigation

- Wildlife Management and Monitoring Plan
- Flight Impact Management Plan
- Specific monitoring proposal for Dall's sheep
- Speed limits, warning signs for potential collision zones. Traffic stops when wildlife near roadway
- Minimize attractants to bears. Warning and encounter management.
- No hunting/fishing by employees.

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Mine Closure

- Completely fill Mine to stop portal drainage
- Cover Waste Rock Pile, limit seepage
- Treat/Monitor groundwater until quality stable and groundwater discharge will not have significant impacts
- Remove buildings and infrastructure
- Restore natural floodplain

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Post-Closure Water Quality

- >99% of groundwater predicted to flow around the backfill
- Fault structure groundwater discharge occurred pre-mine
- Zinc concentrations in Prairie Creek predicted to be lower than pre-mine
- Other metal concentrations predicted to attenuate and be less than objectives
- Monitoring to verify, groundwater treatment as contingency

SUMMARY OF PRAIRIE CREEK EXISTING AND PREDICTED WATER QUALITY POST-CLOSURE (mg/L)

	Prairie Creek		RCA (Mean+2SD)*		CZN Objective	Predicted In-Stream Concentrations at Harrison Creek			
						Mean Creek Flow		Low Creek Flow	
	Up-stream*	Down-stream#	Value	%<DL		Low	High	Low	High
Ag	0.00074	0.000002	0.00229	87	0.0001	0.00002	0.00002	0.00002	0.00002
As	0.00012	0.00038	0.00028	30	0.005	0.00013	0.00014	0.00013	0.00016
Cd	0.000031	0.000039	0.000086	26	0.00038	0.000049	0.000065	0.000051	0.000064
Cu	0.00047	0.00035	0.00243	20	0.004	0.00056	0.00060	0.00056	0.00059
Fe	0.036	0.061	0.163	0	0.163	0.005	0.005	0.005	0.006
Hg	0.000013	ND	0.000027	88	0.000026	0.000020	0.000024	0.000020	0.000023
Pb	0.00011	0.00016	0.00090	39	0.007	0.00029	0.00034	0.00029	0.00045
Sb	0.00010	0.00024	0.00019	40	0.02[1]	0.00013	0.00021	0.00014	0.00021
Se	0.00116	0.00124	0.00208	11	0.00208	0.00116	0.00118	0.00116	0.00117
Zn	0.0055	0.0163	0.0190	11	0.035	0.0067	0.0204	0.0066	0.0613
SO^4	67.0	73.9	103.5	0	200	35.7	97.0	35.7	101.0

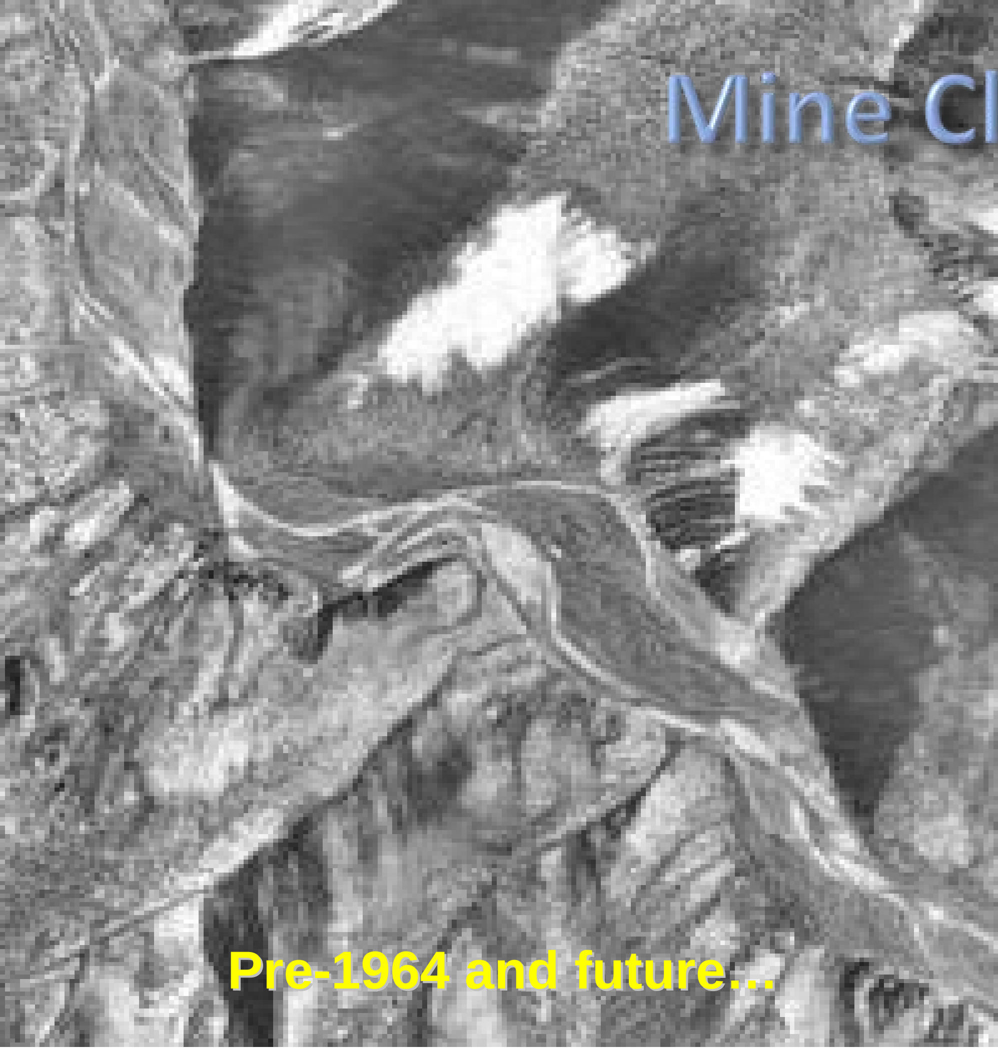
Notes: Silver and mercury predictions used a background value of 0.00002.
Predicted zinc and sulphate concentrations were higher pre-mine.

* Means from existing database, non-detections for each parameter assigned a value half the lowest detection limit

\# Old NNPR boundary, means from existing EC database, non-detections for each parameter assigned a value half the lowest detection limit

Bold = Exceeds Objective 1 Ontario guideline ND = No Data

Mine Closure



- **Fill in underground mine**
- **Cover for Waste Rock Pile**
- **Remove buildings and infrastructure**
- **Restore natural floodplain**

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Economic Benefits

- Priority hiring
- Priority on Contracts
- Percentage of Project's Profits
- Education & Training Funds
- LKFN Trust Fund
- Capacity Building Contribution
- Anchor Tenant in Band Office
- Ongoing Annual Community Events

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Social Issues Programs

- Money Management
- Health Awareness
- Coordinating Family Assistance
- Ongoing Community Event Sponsorship
- Youth Workshops
- Traditional Harvesting
- Assistance with accessing Gov’t Programs

Mahsi Cho