

# Stanleigh Treatment Facility Replacement

**BC MEND November 28, 2007**

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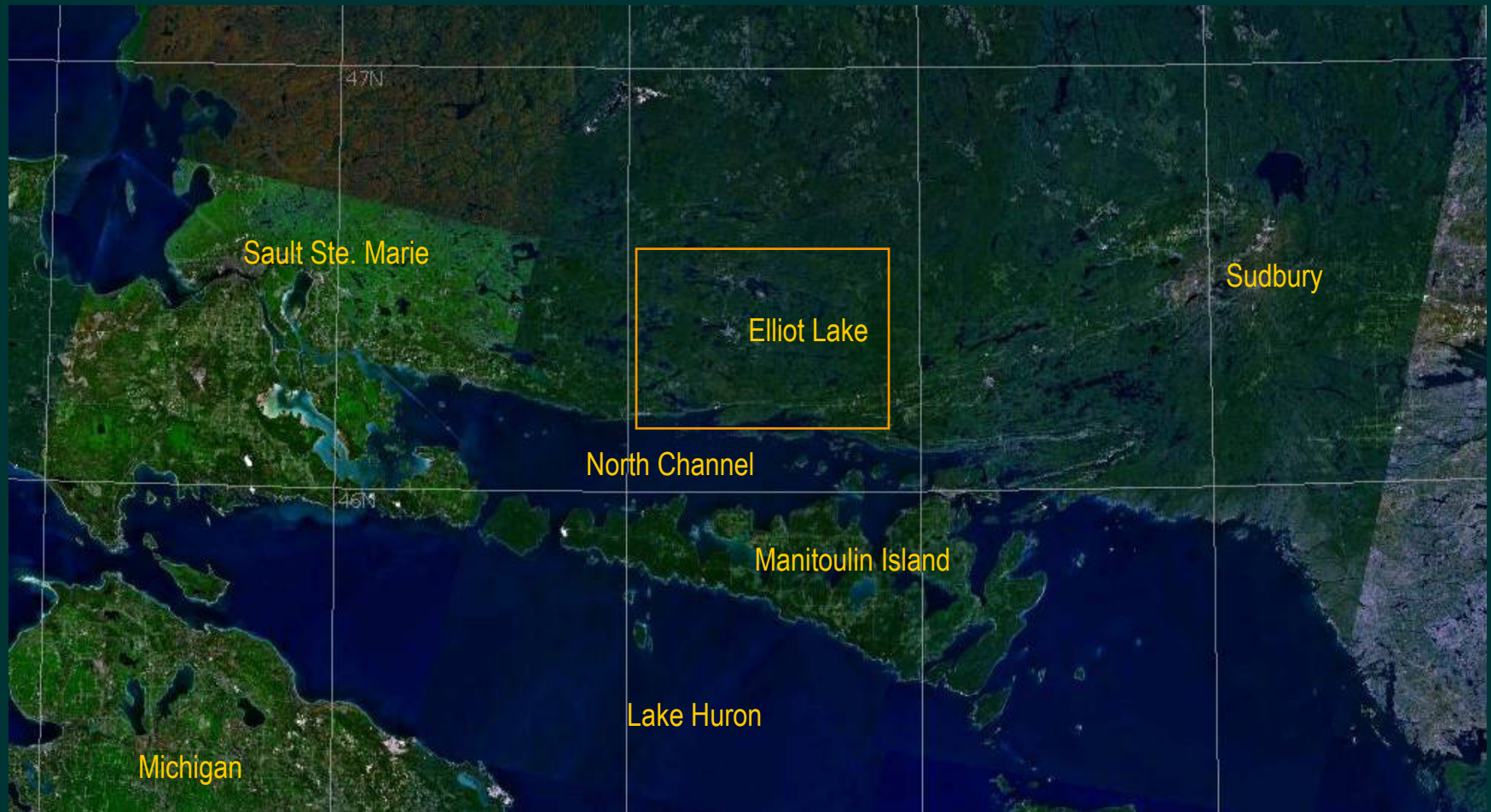
Maxine Wiber, VP Closed Mines

Art Coggan, Construction Manager



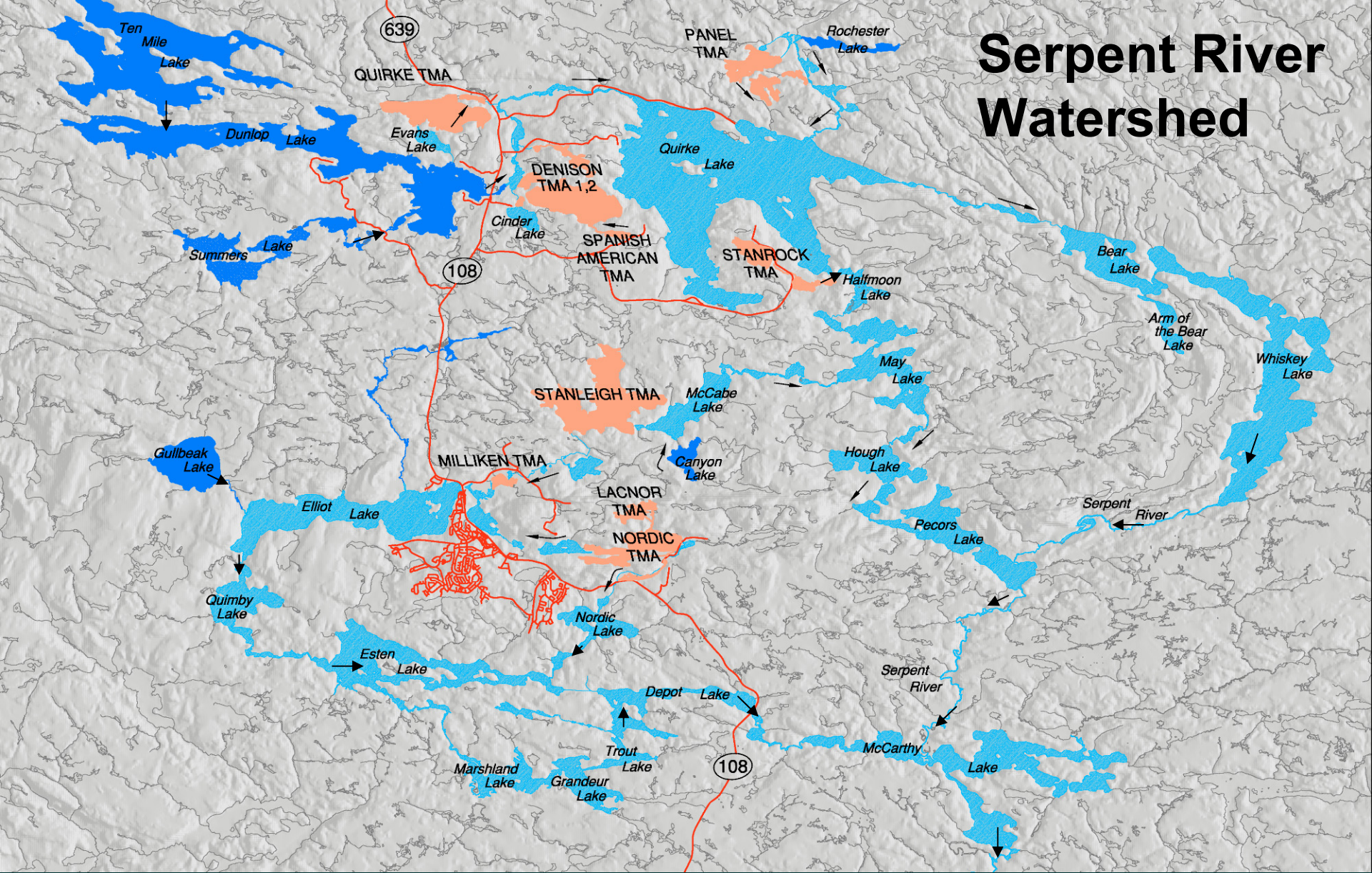
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# Elliot Lake Location Map



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# Serpent River Watershed



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# Stanleigh TMA 1996

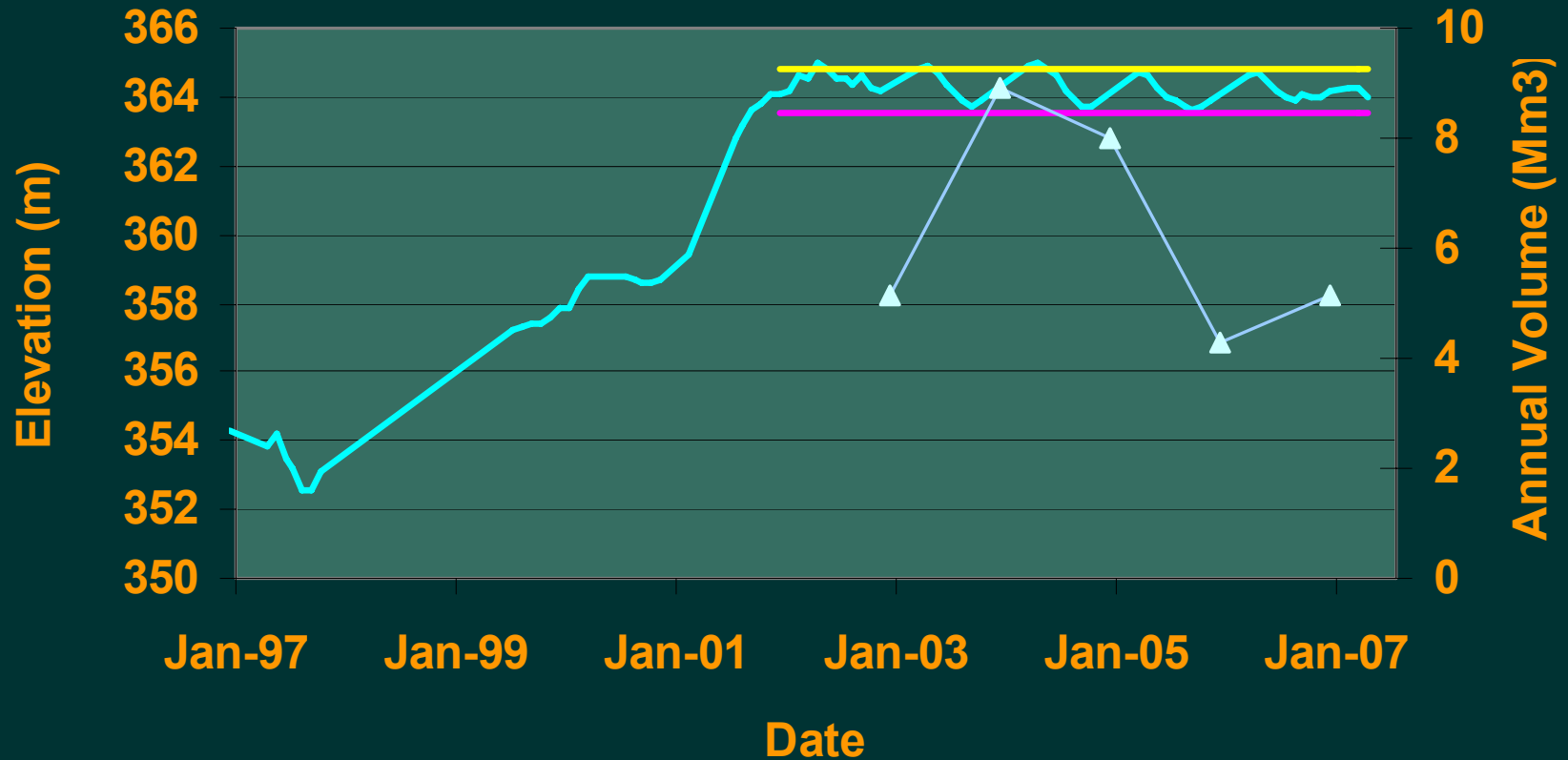




# Stanleigh TMA June 2005



# Stanleigh Operating Elevations and Treatment Volumes

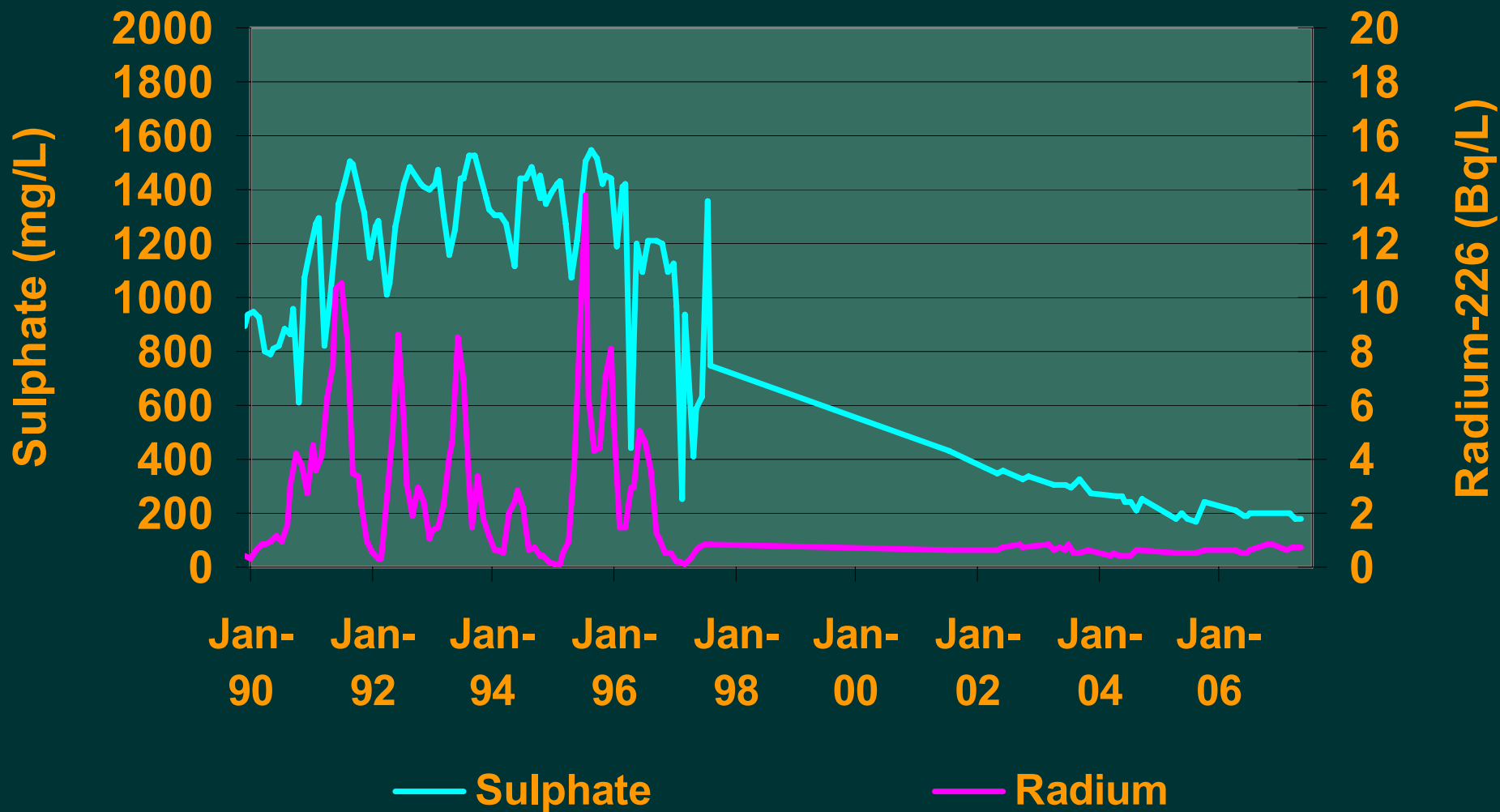


— TMA Elev                      — Min Operating  
— Max Operating                —▲ Annual Volume Treated



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# Flooded Basin Surface Water Quality



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# Basin Water Quality November 2005

	Action Level	PWQO	Unit	Count	Max	Min	Avg
pH		6.5 - 9.5		9	6.9	6.5	
TSS	30		(mg/L)	9	1	1	1
Sulfate			(mg/L)	9	249	242	244
Radium	0.37	1	(Bq/L)	9	0.68	0.33	0.52
Uranium		0.005	(mg/L)	9	<0.005	<0.005	<0.005
Cobalt		0.0009	(mg/L)	9	0.0009	0.0006	0.0007
Copper <sup>1</sup>	0.300	0.005	(mg/L)	9	<0.001	<0.001	<0.001
Iron		0.3	(mg/L)	9	0.120	0.078	0.090
Lead <sup>1</sup>	0.2	0.005	(mg/L)	9	0.0009	0.0006	0.0007
Nickel	0.5	0.025	(mg/L)	9	0.0032	0.0022	0.0027
Selenium		0.1	(mg/L)	9	0.0004	0.0003	0.0003
Silver		0.0001	(mg/L)	9	0.00051	0.00025	0.00040
Zinc	0.5	0.03	(mg/L)	9	0.005	0.002	0.003

1. PWQO adjusted for hardness



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# Current Treatment Plant



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# Physical Components

- TMA Spillway
- Settling Pond Dam and Spillway
- New ETP
- Settling Pond
- Demolition existing ETP



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# Hydrological Analysis

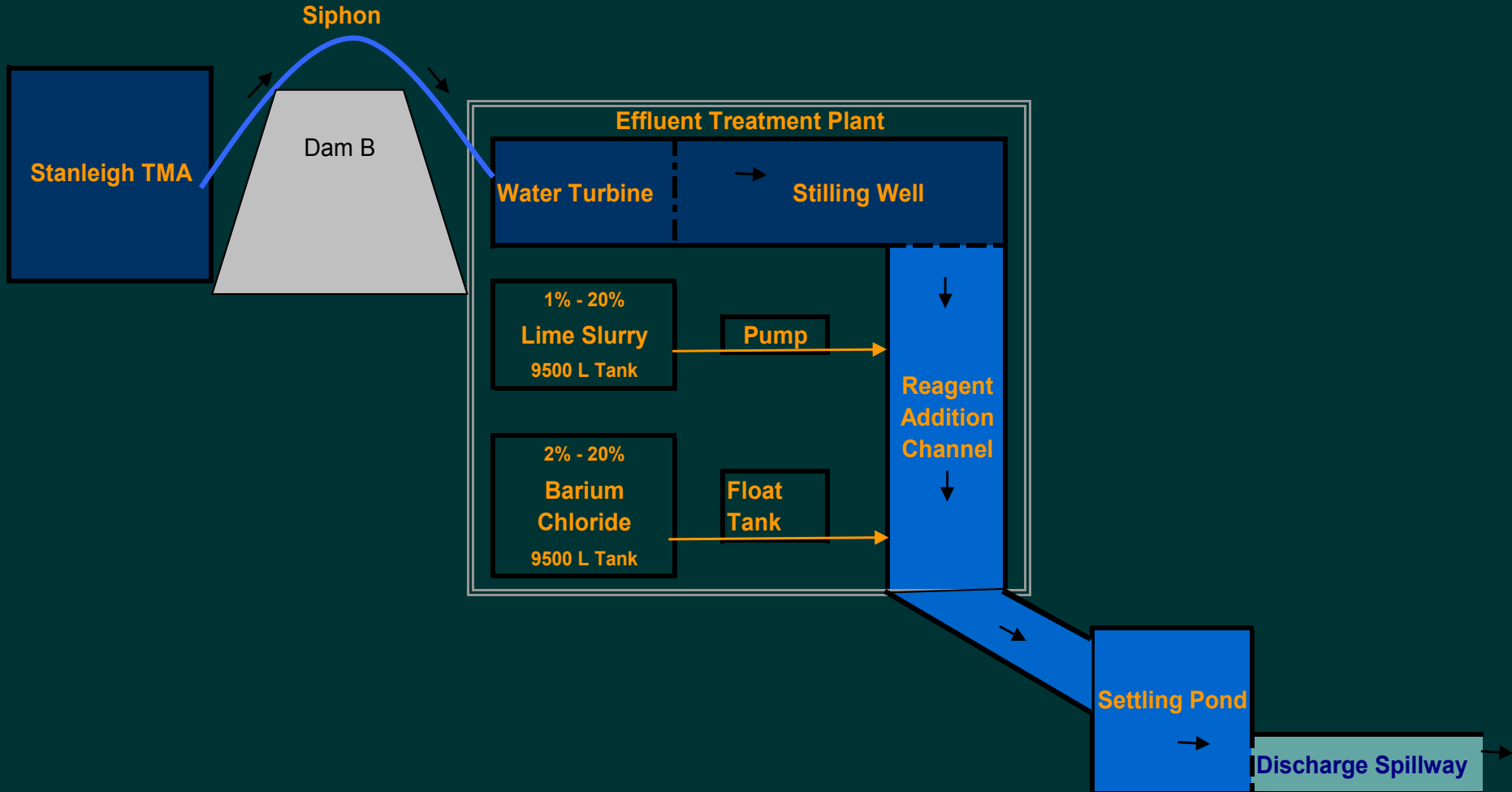
- Based on current TMA configuration with Diversion Dams R3, R5, 9 and 10 in place for final watershed area of 13.3 km<sup>2</sup>
- 2005 dam safety review recently completed by SNC Lavalin confirm PMP estimate as conservative; based on 1971 to 2000 data set; PMP range 276 mm (Sudbury) to 354mm (Mississauga Hydro) over 12 hour period
- Peak TMA elevation during the PMP (424 mm in 12 hours) event would be 1210.5'; or 4.5' below the crest of Dam B;
- Retention of diversion dams enable TMA spillway raise of 0.6 m while maintaining projected water elevations consistent with 1996 design for TMA with diversion dams removed – increase operational freeboard and long-term drought protection
- Settling Pond Dam designed to safely convey flow resulting from PMP assuming TMA starting water elevation at invert of TMA spillway

# Design Criteria

- Settling Pond/Treatment Plant
    - 11 ha; 0.24 Mm<sup>3</sup> capacity
    - Average flow volume 8.7 Mm<sup>3</sup>/yr (annual average precipitation)
    - Normal operating rate 275 L/s
    - Treatment capacity to 500 L/s (15.8 Mm<sup>3</sup>/yr)
  - Dam
    - Zoned rockfill dam with till core founded on bedrock based on design criteria consistent with those in place at all other Elliot Lake facilities
    - Safely convey flow from PMP
    - Stable for 1,000 year return earthquake
    - No loss of structural integrity for Maximum Credible Earthquake
    - Seepage of < 1 L/s
- 



# New Plant Diagram



# Operations and Maintenance

- The new treatment facility does not change tailings management area operating levels
- Flow and reagent addition rates are expected to be very similar to current operations
- Operational spillway convey and measure flows up to 1 in 100 year return event; incorporate stop log structure to provide 0.3m storage during upset conditions
- Operating staff have been involved in review of treatment plant design and will participate directly in plant commissioning
- Instrumentation and equipment has been selected for simplicity, ease of maintenance and compatibility with existing treatment plants

# Energy Efficiency Focus

- Anticipate energy consumption reduction of 95%
  - Incorporate alternative (green/renewable) energy sources into design:
    - Gravity feed inflow and tiered foundation to allow gravity feed of reagents
    - Building size and materials to minimize heating costs
    - Cross-flow turbine installed at siphon outlet provide electricity required for plant operations
    - 12 KW diesel generator maintain battery pack during shut-down; instrumentation designed to minimize energy draw
    - Power management system to manage integration of energy sources
- 





# Project Surface Water Influences

- Conditions in the receiving environment are not expected to change as a result of the new treatment facility
- Annual discharge volume will be the same as current system
- Effluent quality will be similar to existing facility
- No significant change expected in annual loadings from new facility



# Permits Required

Canadian Nuclear Safety  
Commission



Canadian Environmental  
Assessment Act

Ministry of Environment

Ministry of Natural  
Resources



Class EA – Resource Stewardship  
and MOE Electricity EA

Fisheries & Oceans Canada

- **CNSC - Amendment to existing license condition.**
- **CEAA Triggered by federal license amendment – Screening level.**
- **MOE - Certificate of Approval Industrial Sewage; Certificate of Approval Air for diesel generator**
- **MNR – Land Use Permit for hydro generation and Work Permit**
- **Disposition water rights trigger Class EA through MNR and Electricity EA with MOE**
- **Clearance Letter from DFO under Fisheries Act**

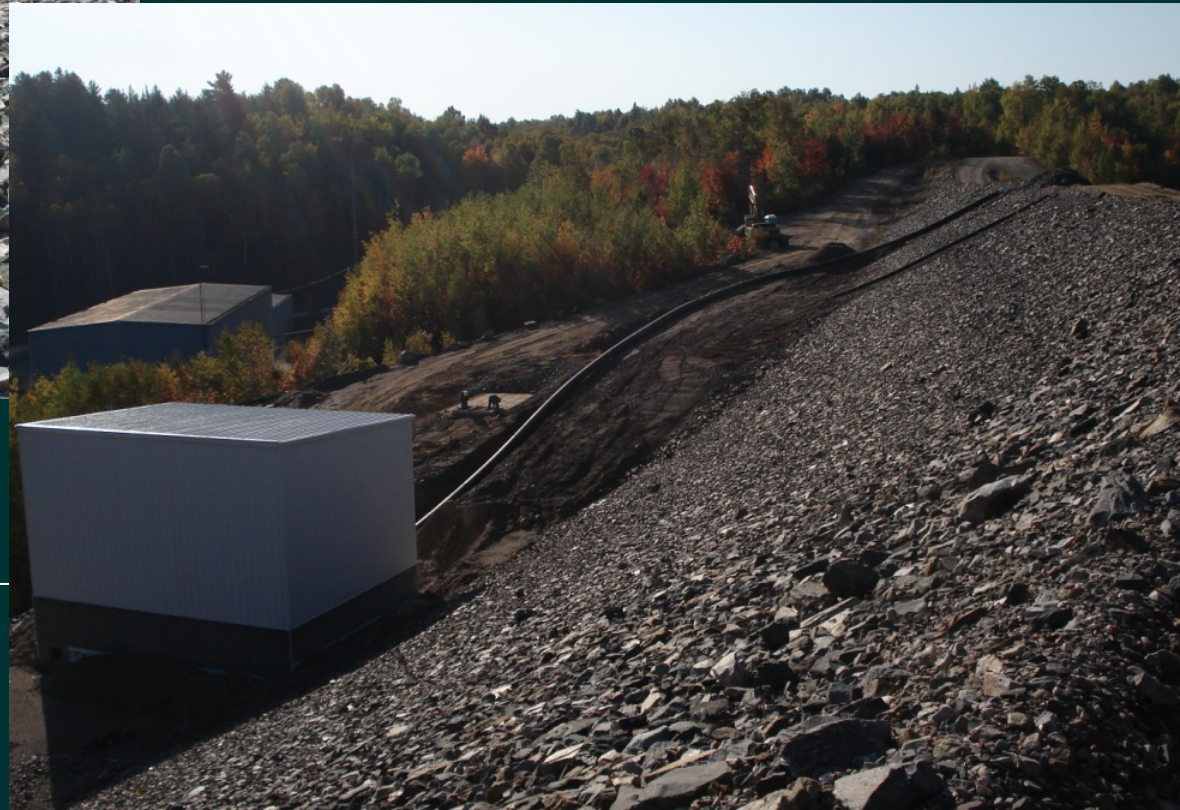


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# Settling Pond Dam



# Treatment Plant



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