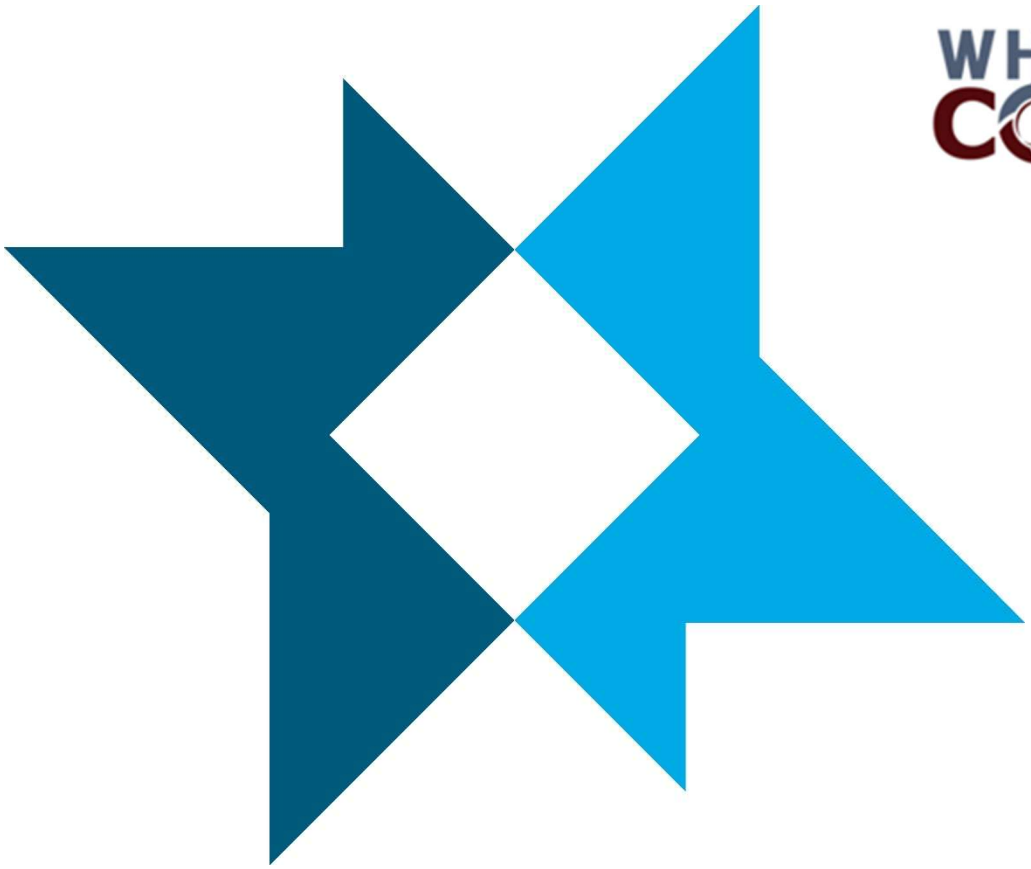
Mining Permit Application
White Pine North Project
Volume IC
Appendices E-4 through I



White Pine Copper LLC
White Pine, Michigan

September 2026

Project I.D.: 23W200

Solving our clients' toughest science and engineering challenges.

E-4

Water Management Design Technical Report

Technical Report

Water Management Design

White Pine North Project



White Pine Copper LLC
White Pine, Michigan

August 2026

Project ID: 23W200

Solving our clients' toughest science and engineering challenges.

Water Management Design
White Pine North Project

Project ID: 23W200

Prepared for
White Pine Copper LLC
White Pine, Michigan

Prepared by
Foth Infrastructure & Environment, LLC

August 2026

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Water Management Design
White Pine North Project

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Appendix B GoldSim Water Balance Modeling Data – No Design Storm Events
Appendix C GoldSim Water Balance Modeling Data – Two Design Storm Events

List of Abbreviations, Acronyms, and Symbols

°C	degrees Celsius
°F	degrees Fahrenheit
af	acre feet
BMP	Best Management Practices
Foth	Foth Infrastructure & Environnement, LLC
ft^3	cubic feet
gpm	gallons per minute
LOM	life of mine
m	meter
m^3	cubic meter
m^3/hr	cubic meter per hour
mm	millimeter
NOAA	National Oceanic and Atmospheric Administration
NP1	North Pond 1 (historically referred to as North Dam 1 or ND1)
NP2	North Pond 2 (historically referred to as North Dam 2 or ND2)
NPDES	National Pollutant Discharge Elimination System
SI	International System of Units
South Dam	South Tailings Disposal Facility
TDF	Tailings Disposal Facility
US units	United States customary system units
WMS	Water Management System
WPC	White Pine Copper LLC
WWTP	Industrial Wastewater Treatment Plant

1. Introduction and Background

1.1 Introduction

White Pine Copper LLC (WPC) is wholly owned by Kinterra Copper USA LLC. WPC is seeking to develop the brownfield site of White Pine Mine located 7.5 kilometers (4.7 miles) south of Lake Superior, east of M-64, in Carp Lake Township, Ontonagon County, Michigan. The site reference coordinates are (46°46'6.2"N, 89°33'57.4"W) and the project site elevation is 259 meters above mean sea level (850 feet above mean sea level) (Drawing No. 00 – Cover Sheet and Site Location). White Pine Mine was part of the Upper Peninsula of Michigan's historical copper mining district. Underground mining on site began in the late 1800s. In 1952, the Copper Range Company began construction of a fully functioning underground mine and surface processing facilities including a concentrator, smelter, and refinery. Tailings were placed in three tailings areas historically known as North Dam 1, North Dam 2, and the South Dam. The North Dam 1 and North Dam 2 tailings disposal facilities are referred to throughout this report as North Pond 1 (NP1) and North Pond 2 (NP2), respectively; the South Dam is referred to as the South Tailings Disposal Facility (South TDF). Mining and processing ceased in 1997, and a State of Michigan Consent Decree was established.

WPC is planning to mine underground east of, and separate from, the historic underground mine workings of White Pine Mine. Copper ore will be extracted using conventional drill and blast room and pillar mining methods. A processing plant will be constructed on site to produce a copper concentrate, and processing will include crushing, grinding, flotation, concentrate thickening, and filtration. Tailings will be managed through re-use of one or more of the existing tailings dams.

1.2 Key Reference Documents

Foth Infrastructure & Environment, LLC (Foth) is preparing a WPC Water Management Design. The following key reference documents were considered in developing the WPC Water Management Design:

- Bedell Pond Engineering Report (McCulley Frick & Gilman, Inc., April 22, 1999)
- LiDAR Data (Ausenco; Foth received October 6, 2025)
- Site Conditions Design Criteria (Ausenco; November 14, 2025)
- Site Layout Map (Ausenco; December 1, 2025)
- Water Management Design Criteria Report (Foth; December 23, 2025)
- GoldSim Model Construction (Foth, August 3, 2026)

The objective of the Water Management Design is to develop the infrastructure design to contain and manage facility contact and non-contact water locations (Drawing No. WM-04 Contact and Non-Contact Areas) throughout the life of mine (LOM). The Water Management Design criteria exclude water managed within the:

- Mine portal and mine dewatering.
- Processing Plant except for exterior storm water from precipitation.
- NP1, NP2, and South TDF.
- Outside the watershed and ore processing limits shown on Drawing No. WM-03.

The Water Management Design focuses more on contact water management. An assessment of the pre- and post-development peak off-site discharge will be provided during the detailed

design for the future construction storm water permit. It is expected that since a significant portion of the watershed is managed through retained and treated contact water that is discharged in a controlled manner that post-development peak discharge will be less than or equal to the pre-development peak discharge.

Foth relied upon the WPC operational water balance to design the site-wide water management systems (WPC Operational Water Balance – Paste Tailings, Foth, 2026). The mine engineering team designed the underground water management system for mine operations, the mill engineering team designed water management systems internal to the mill, and the tailings engineering team designed systems transporting water to and from the tailings ponds. Based on the water balance, Foth designed contact water and non-contact water management systems and soil and sediment control systems.

Sources of storm water to be managed using the Water Management Design are listed in Table 1-1 and include contact and non-contact storm water. The focus of the Water Management Design is on capturing, containing, and discharging contact storm water. Contact storm water will be contained in an upgraded, existing storm water sump northeast of the process plant area, a lined Contact Water Pond in and around the area of the existing Bedell Pond and other contact storm water sumps, as needed.

Table 1-1
Delineating Contact and Non-Contact Storm Water

Process (Contact) Water		Non-Contact Water[1,2]	
Industrial Wastewater	**Contact Storm Water**	**Storm Water Requiring Monitoring and Sediment Removal**	**Storm Water that does NOT Require Monitoring and Sediment Removal**
◆ Mine Dewatering ◆ Ore processing wastewater ◆ TDF slurry and supernatant ◆ Storm water mixed with industrial wastewater	◆ Box cut during construction ◆ Ore stockpile ◆ Process Plant ◆ Truck wash wastewater ◆ Truck shop area ◆ Ore truck route roads ◆ Contact Storm Water Collection Sumps ◆ Contact Water Pond ◆ TDF	◆ General construction storm water ◆ Storm water falling on non-contact areas including access roads outside contact area ◆ Building roof water ◆ Storm water from surface water sources (prior to mixing with contact storm water) ◆ Contact Water Pond and other berms until vegetation is in place (sediment ponds utilized)	◆ Natural runoff ◆ Natural runoff that flows through culverts, swales, ditches, etc. without mixing with contact storm water ◆ Contact Water Pond and other berms after vegetation is in place

Notes: Prepared by: BDS1
[1] Industrial storm water is non-contact water and includes storm water and runoff from the fully constructed facility. Checked by: BJS1
[2] Sanitary wastewater is another category that is neither process water nor non-contact storm water.

1.3 Purpose of Report

The purpose of this report is to document current design criteria, provide design drawings, and present a list of estimated materials, and quantities. The following key design criteria and project requirements are included, at minimum:

- Define precipitation regime that will be used for water balance analysis (Sections 3.1 and 3.2).
- Define design storm events for various Water Management System (WMS) components (Section 3.2).
- Define contact and non-contact water management areas, strategy, and criteria (Sections 4 and 5).
- Analyze water management for heavy precipitation events confirming adequate design storage volumes and management strategies for water management facilities (Section 4).
- Define key design criteria for WMS components to be designed by Foth (Section 5).
- Define contact snow management strategy (Section 5).
- Make further Water Management Design recommendations as appropriate to achieve the Water Management Design Scope of Work (Section 6).

2. General Design Criteria

2.1 Project Layout and Topography

Drawing No. WM-01 shows existing site conditions including topography and Drawing No. WM-02 shows a general site layout with WMS components identified. The locations and areas of these WMS components form design location constraints that were established on the existing project drawings as shown on Drawing No. WM-02. Key elements shown on the site plan include:

- Portal;
- Temporary Ore Stockpile;
- Crushed Ore Stockpile and Mill Feed Conveyor;
- Process Plant Area;
- Process Plant Area Contact Water Sump;
- Contact Water Pond;
- Contact Water Sumps;
- Non-contact Water Ponds;
- Tailings Disposal Facility (NP1);
- Industrial Wastewater Treatment Plant (WWTP);
- Main access roads; and
- Other existing and proposed facilities.

Other facilities shown include mine laydown area and minor access roads.

2.2 Unit System

The unit system for the design will include a combination of International System of Units (SI) and United States customary system units (US units). US unit examples include gallons, feet, and inches, where 1 foot = 0.3048 meters (m) (international foot). Excluding water quality parameter concentrations, permit limits are typically in US units so treatment system design will also provide US units where appropriate. The base map and contours will be in SI units in accordance with (UTM with NAD83 datum, Zone 16, Meter; Central Meridian 87d W). Critical dimensions of improvements will be provided in both SI and US units.

2.3 Codes and Standards

Michigan Natural Resources and Environmental Protection Act 451 (under Chapter 324 of Michigan Compiled Laws) applies to components of the WMS.

2.4 Project Datum

The project coordinate system for the base map is to be UTM with NAD83 datum, Zone 16, Meter; Central Meridian 87d W with meters. For design drawings, units will be converted to U.S. standard feet, as needed.

Foth recommends establishing one or more project control points (commonly referred to as benchmarks or monuments) which can be referenced on plans and used during construction.

2.5 Life of Mine Periods

The operating service LOM is projected to be 26 years, which is preceded by a construction period and followed by facility closure and post-closure care.

3. Climate and Runoff Design Criteria

The HydroCAD water model has several runoff-related inputs. Key runoff parameters are related precipitation, runoff coefficients (based on existing and post-development ground cover), and time of concentration (based on existing and post-development ground cover and slopes). Design storm events are relevant for design of piping, ditches, pump stations, water containment structures.

3.1 Regional Weather Data

The National Weather Service web site (https://www.weather.gov/wrh/Climate?wfo=dlh) was used to locate and download regional weather data. The downloaded precipitation and temperature daily data were from USC00204104-IRONWOOD, M.

3.1.1 Temperature, Evaporation, and Precipitation

Table 3-1 summarizes annual average values for precipitation, temperature, and evaporation. A more detailed presentation of precipitation, temperature, and evaporation data and climate change projections are provided in Appendix A.

Table 3-1
Select Input Data for Water Balance Modeling

Water Balance Element	Unit	Value	Comment
Met Station Reference Location	NA	NA	Ironwood, MI 2005-2024
Temperature			
Maximum	°C (°F)	25.7 (78.3)	2005-2024 (Foth, Dec. 12, 2025)
Annual average	°C (°F)	4.8 (40.6)	2005-2024 (Foth, Dec. 12, 2025)
Minimum	°C (°F)	-15.7 (3.7)	2005-2024 (Foth, Dec. 12, 2025)
Evaporation			
Annual average	mm (inch)	548.9 (21.61)	2005-2024 (Foth, Dec. 12, 2025)
Precipitation			
Maximum	mm (inch)	114.3 (4.5)	2005-2024 (Foth, Dec. 12, 2025, Ironwood, MI)
Average monthly	mm (inch)	81.3 (3.2)	1950-2013 (Foth, Dec. 12, 2025, Ontonagon County, MI)
Minimum	mm (inch)	7.6 (0.3)	2005-2024 (Foth, Dec. 12, 2025, Ironwood, MI)
Annual maximum snowfall	mm (inch)	7571.7 (298.1) 403.9 (15.9) (as water)	Ironwood, MI data, Foth, Dec. 12, 2025 (part of total precipitation)
Annual average snowfall	mm (inch)	3718.5 (146.4) 177.8 (7.0) (as water)	Ironwood, MI data, Foth, Dec. 12, 2025 (part of total precipitation)

Table 3-1 (continued)

Water Balance Element	Unit	Value	Comment
Met Station Reference Location	NA	NA	Ironwood, MI 2005-2024
Annual maximum rainfall	mm (inch)	952.5 (37.5)	Ironwood, MI data, Foth, Dec. 12, 2025 (part of total precipitation)
Annual average rainfall	mm (inch)	652.8 (25.7)	Ironwood, MI data, Foth, Dec. 12, 2025 (part of total precipitation)
Design Storm Events for Piping, Ditch, Pump Station Sizing			
Non-Contact and Contact Water	mm (inch)	53.3 (2.1)	10-year, 60-min; NOAA Atlas 14, Volume 8, Version 2; MDOT Storm Water Treatment Manual, March 2025
Design Storm Events for Storm Water Ponds (Contact Water Pond)			
Industrial water containment regulatory requirement	mm (inch)	161.0 (6.34)	100-year, 24-hour; NOAA Atlas 14, Volume 8, Version 2; MDEQ, 1999, Storm Water Management Guidebook, Ch. 6, p. 47

°C = degrees Celsius
°F = degrees Fahrenheit
mm = millimeter
NOAA = National Oceanic and Atmospheric Administration

Prepared by: BDS1
Checked by: BJS1

3.1.2 Frozen Months

Data for frozen months were calculated from the monthly historic temperature data showing frozen months as those with average monthly temperature less than 32°F. These are used in the GoldSim model to generate a set of yearly frozen months based on a simple linear correlation and no probabilistic analysis. From the monthly historic temperature data, the average annual frozen months used for model projections in 2005 was 5 months.

3.2 Storm Intensity and Design Storm Events

As listed in Table 3-1, two design storm events were identified for sizing piping, ditches, and pump stations and for evaluation of Contact Water Pond capacity: a typical regulatory requirement and a more conservative extreme storm event.

3.2.1 Regulatory Basis for Design Storm Events

While the Michigan guidance or facility National Pollutant Discharge Elimination System (NPDES) permit does not specify a design storm event, it requires detailed engineering and hydrologic analysis to ensure the impoundment can manage worst-case discharge scenarios, which typically include the 100-year, 24-hour storm for flood protection (Storm Water Management Guidebook, Ch. 6, p. 47; MDEQ, 1999). The Michigan storm water calculator[1] uses

[1] https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Forms/WRD/NPS/EQP9278-Calculations-for-Storm-Water-Runoff-Volume-Control.xlsx)

a 10-year, 24-hour storm event as the basis for evaluating storm water conveyances (ditches, gravity piping, weirs, etc.).

3.2.2 Storm Intensity

Storm intensity data are published by NOAA for locations throughout the United States. The closed NOAA point precipitation frequency estimates are from Bergland Dam, Ontonagon County, MI (latitude 46.5869°, longitude -89.5475°). The 10-year, 60-minute, 53.3 mm (2.1 inches) and 100-year, 24-hour storm, 161.0 mm (6.34 inches) intensities are illustrated on the WPC, Ontonagon County, MI storm intensity data (Foth, Dec. 12, 2025) and shown in Table 3-1.

Ponds or sumps are designed to manage the design storm within the high/maximum water level. The additional berm height above the maximum water level is called the freeboard. For the Non-Contact Water Ponds, an outflow to a non-contact water bypass channel (bypass channel) is located at or just above the maximum water level.

3.2.3 Design Storm Events

As shown in Table 3-1 design storm events include:

- 53.3 mm (2.1 inches) per hour for piping, ditch, and pump station sizing; and
- 161.0 mm (6.34 inches) (100-year, 24-hour storm) for the Contact Water Pond with 1.0-m (3.28 feet) freeboard.

4. Water Balance Flow and Storage Design Criteria

This section presents the water balance flow and storage design criteria and describes how they were developed. As an introduction, the time periods, and locations when and where water will be generated and where it would be treated and/or discharged are described. The design criteria for water balance flows and storage facilities will then be summarized.

4.1 Categories and Sources of Water

Contact and non-contact storm water must be managed throughout the WPC surface facilities. Table 1-1 lists contact and non-contact storm water sources. The Water Management Design focuses on water management within the contact and non-contact drainage areas shown on Drawing Nos. WM-03 and WM-04.

4.2 Water Management Design Modelling

Water Management Design modeling of contact and non-contact water is presented in this section. Contact water will be conveyed to the Contact Water Pond via ditches, culverts, or pressure pipelines discharging from pumped collection sumps/pump stations (e.g., the process plant area, the temporary ore stockpile) (see Drawing No. WM-02). Site-specific procedures for managing non-contact storm water will incorporate Drawing No. WM-05 and the Soil Erosion and Sediment Control, Storm Water Pollution Prevention, and Pollution Incident Prevention Plans.

Appendix A presents the water management storm water flow network.

- Contact water is generated in the Southeast Watershed, slag pile area, temporary ore stockpile, and crushed ore stockpile.
- Non-contact water is generated in the West Watershed (except for the slag pile area) and Northeast Watershed (see Drawing No. WM-03).

Contact water from the Process Plant Area is routed to the upgraded, lined Process Plant Contact Water Sump (1P) via an existing storm sewer piping and manhole network and overland flow. Southeast watershed and Process Plant Area overland flow occurs within a previously developed area as shown on Drawing No. WM-02. Contact water contained in the Process Plant Area Contact Water Sump is routed directly to the Contact Water Pond (2P) via a 72-inch high-density polyethylene pipeline.

Non-contact water from the West Watershed and Northeast Watershed is routed to the existing Non-Contact Water Ponds (3P) via overland flow. The first pond acts as the primary settling pond and the remaining ponds provide additional reduction in suspended solids. Collectively, the Non-Contact Water Ponds also function as flow equalization ponds. Storm water more than the design retention capacity of 161 mm (6.34 inches) will flow through a bypass channel discharging at Outfall 3L directly to the receiving stream immediately below the Contact Water Pond as shown on Drawing Nos. WM-02 and WM-07.

The design criteria associated with water management described in Section 5 were developed and validated using the HydroCAD model input values and output relative to the various water balance flow streams are discussed in a memorandum provided in Appendix A and summarized in Table 4-1.

Table 4-1
HydroCAD Storm Water Analysis Input and Output Summary – Metric

Area	Description	Runoff Area (ha)	Imper-vious	Average Runoff Depth (mm)	Flow Length (m)	Slope	Tc (min)	CN	Peak Runoff Flow (m^3/s)	Total Runoff Volume (Ml)
1S	Process Plant Area	9.00	72%	126.00	107	0.005	5.3	91	5.38	11.34
2S	West Watershed (non-contact)	35.67	83%	133.00	625	n/a	13.2	94	17.39	47.54
3S	Northeast Watershed (non-contact)	25.97	73%	131.00	274	0.01	6.0	93	15.44	34.01
4S	Crushed Ore Stockpile	0.96	100%	142.00	n/a	n/a	5.0	98	0.61	1.36
5S	Temp. Ore Stockpile	7.07	100%	142.00	n/a	n/a	5.0	98	4.52	10.01
6S	Southeast Watershed (non-contact)	19.48	72%	126.00	107	0.005	5.3	91	11.65	24.53
7S	Explosive Magazine Area	1.44	100%	142.00	n/a	n/a	5.0	98	0.92	2.04
8S	Mining Laydown Area	1.29	100%	142.00	n/a	n/a	5.0	98	0.82	1.82
9S	Effluent Treatment Plant Area	0.46	72%	126.00	n/a	n/a	5.0	91	0.28	0.57
10S	Fuel Station	0.05	100%	142.00	n/a	n/a	5.0	98	0.03	0.07
11S	Contractor Laydown Area	2.61	100%	142.00	n/a	n/a	5.0	98	1.67	3.70
12S	Main Road (West)	1.56	100%	142.00	n/a	n/a	5.0	98	1.00	2.20
13S	Portal Area	0.96	100%	142.00	n/a	n/a	5.0	98	0.61	1.36
14S	Main Road (East)	2.33	100%	142.00	n/a	n/a	5.0	98	1.49	3.30
15S	Explosive Magazine Access Road	0.02	100%	142.00	n/a	n/a	5.0	98	0.01	0.02
16S	WWTP Access Road	0.25	100%	142.00	n/a	n/a	5.0	98	0.16	0.35
17S	WWTP Roadway South	0.63	100%	142.00	n/a	n/a	5.0	98	0.40	0.89
18S	WWTP Roadway East	0.24	100%	142.00	n/a	n/a	5.0	98	0.15	0.34
19S	Main Road (North)	0.01	100%	142.00	n/a	n/a	5.0	98	0.01	0.01
22S	Mining Laydown Access Road	0.37	100%	142.00	n/a	n/a	5.0	98	0.23	0.52
23S	Slag Stockpile	4.59	100%	142.00	n/a	n/a	5.0	98	2.93	6.49

Area	Description	Inflow (m^3/s)	Inflow (Ml)	Capacity (m^3/s)	Outflow (m^3/s)	Outflow (Ml)	Flow Depth (m)	Max Vel (m/s)	Diameter (mm)	n	L (m)	S
2R	SE Watershed Storm Sewer	12.68	37.154	12.99	12.19	37.00	1.41	2.18	1829	0.012	1,160	0.0100
3R	Non-Contact Water Overland Flow	30.60	81.550	38.76	28.21	81.13	1.30	2.18	n/a	0.035	457	0.0067
5R	NW Area Ditch Flow to CWP	1.06	2.395	2.89	1.05	2.39	0.38	4.06	914	0.012	30	0.0200
7R	WWTP Area Surface Flow	0.28	0.574	0.38	0.26	0.57	0.28	2.49	457	0.012	198	0.0138
8R	Crushed Ore Stockpile Pumped Flow	0.61	1.361	0.69	0.59	1.36	0.44	2.68	610	0.012	91	0.0100
10R	Explosive Magazine Roadway Ditch Flow	0.01	0.022	8.56	0.01	0.02	0.04	0.97	n/a	0.013	211	0.0296
12R	WWTP Roadway South Ditch Flow	0.40	0.891	4.94	0.30	0.89	0.20	1.58	n/a	0.013	607	0.0099
17R	Non-Contact Water Bypass Spillway	0.95	17.941	9.62	0.95	17.53	0.16	0.90	n/a	0.035	335	0.0127
19R	WWTP Roadway West Ditch Flow	0.16	0.349	7.52	0.15	0.35	0.13	1.78	n/a	0.013	175	0.0229
20R	WWTP Roadway East Ditch Flow	0.15	0.339	7.31	0.14	0.34	0.13	1.72	n/a	0.013	231	0.0216
21R	WWTP Combined Ditch Flow	3.34	8.063	8.70	3.21	8.05	0.39	4.04	n/a	0.013	135	0.0185
22R	Main Road (North) Ditch Flow	0.01	0.011	9.81	0.01	0.01	0.03	0.93	n/a	0.013	77	0.0390
23R	Mining Laydown Roadway Ditch Flow	0.23	0.518	3.24	0.19	0.52	0.20	1.01	n/a	0.013	353	0.0042
26R	Main Road (West) Ditch Flow	1.00	2.203	4.93	0.61	2.17	0.26	1.85	n/a	0.013	1,500	0.0098
27R	Main Road (East) Ditch Flow	1.49	3.297	4.74	0.78	3.26	0.32	1.97	n/a	0.013	1,240	0.0091

Pond/ Sump	Description	Peak Elevation (m)	Storage (Ml)	Inflow (m^3/s)	Inflow (Ml)	Outflow (m^3/s)	Outflow (ha)
1P	Contact Water Pond	248.78	49.492	14.88	49.51	0.00	0.000
2P	Proces Plant Area Contact Water (Sump 1)	262.87	3.320	17.03	35.86	12.26	35.795
3P	Non-Contact Water Ponds	251.98	66.568	28.36	82.48	0.95	17.941
11P	Explosive Magazine (Sump 3)	n/a	n/a	0.93	2.06	n/a	n/a
24P	West Road North (Sump 4)	n/a	n/a	0.01	0.01	n/a	n/a
26P	NE Area (Sump 2)	n/a	n/a	1.33	6.03	n/a	n/a
1L	Contact Water Pond Discharge	n/a	n/a	0.00	0.00	n/a	n/a
3L	Non-Conatct Water Pond Discharge	n/a	n/a	0.95	17.53	n/a	n/a
4L	Combined Ore Stockpiles Discharge	n/a	n/a	6.77	19.73	n/a	n/a

Source: Appendix A, HydroCAD Stormwater Modelling Data
Type II 24-hour, 100-year, 24-hour Rainfall = 161millimeters
ha = hectares
m/s = meters per second
m = meters
m^3/s = cubic meters per second
mm = millimeters

Prepared by: BJS1
Checked by: BDS1

Table 4-1 (continued)
HydroCAD Storm Water Analysis Input and Output Summary – U.S. Units

Area	Description	Runoff Area (acres)	Imper-vious	Average Runoff Depth	Flow Length (ft)	Slope	Tc (min)	CN	Peak Runoff Flow (cfs)	Total Runoff Volume (af)
1S	Process Plant Area	22.25	72%	>4.96	35	0.005	5.3	91	190.08	9.19
2S	West Watershed (non-contact)	88.14	83%	>5.24	205	n/a	13.2	94	614.12	38.54
3S	Northeast Watershed (non-contact)	64.18	73%	>5.16	90	0.01	6.0	93	545.29	27.57
4S	Crushed Ore Stockpile	2.38	100%	>5.59	n/a	n/a	5.0	98	21.71	1.10
5S	Temp. Ore Stockpile	17.46	100%	>5.59	n/a	n/a	5.0	98	159.61	8.11
6S	Southeast Watershed (non-contact)	48.14	72%	4.96	35	0.005	5.3	91	411.32	19.89
7S	Explosive Magazine Area	3.56	100%	5.59	n/a	n/a	5.0	98	32.57	1.66
8S	Mining Laydown Area	3.18	100%	5.59	n/a	n/a	5.0	98	29.06	1.48
9S	Effluent Treatment Plant Area	1.13	72%	4.96	n/a	n/a	5.0	91	9.74	0.47
10S	Fuel Station	0.12	100%	5.59	n/a	n/a	5.0	98	1.11	0.06
11S	Contractor Laydown Area	6.45	100%	5.59	n/a	n/a	5.0	98	58.97	3.00
12S	Main Road (West)	3.84	100%	5.59	n/a	n/a	5.0	98	35.14	1.79
13S	Portal Area	2.37	100%	5.59	n/a	n/a	5.0	98	21.66	1.10
14S	Main Road (East)	5.76	100%	5.59	n/a	n/a	5.0	98	52.59	2.67
15S	Explosive Magazine Access Road	0.04	100%	5.59	n/a	n/a	5.0	98	0.35	0.02
16S	WWTP Access Road	0.61	100%	5.59	n/a	n/a	5.0	98	5.57	0.28
17S	WWTP Roadway South	1.56	100%	5.59	n/a	n/a	5.0	98	14.22	0.72
18S	WWTP Roadway East	0.59	100%	5.59	n/a	n/a	5.0	98	5.41	0.27
22S	Mining Laydown Access Road	0.90	100%	5.59	n/a	n/a	5.0	98	8.26	0.42
23S	Slag Stockpile	11.33	100%	5.59	n/a	n/a	5.0	98	103.54	5.26

Area	Description	Inflow (cfs)	Inflow (af)	Capacity (cfs)	Outflow (cfs)	Outflow (af)	Flow Depth (ft)	Max Vel (fps)	Diameter (in)	n	L	S
2R	SE Watershed Storm Sewer	451.00	30.122	458.93	430.40	30.00	4.64	7.16	72	0.012	3,509	0.0100
3R	Non-Contact Water Overland Flow	1080.46	66.114	1368.91	996.25	65.77	4.27	7.15	n/a	0.007	1,500	0.0067
5R	NW Area Ditch Flow to CWP	37.46	1.942	102.18	37.10	1.94	1.25	13.32	36	0.012	100	0.0200
7R	WWTP Area Surface Flow	9.74	0.465	13.39	9.10	0.46	0.92	8.17	18	0.012	650	0.0138
8R	Crushed Ore Stockpile Pumped Flow	21.71	1.103	24.50	20.75	1.10	1.44	8.79	24	0.012	300	0.0100
10R	Explosive Magazine Roadway Ditch Flow	0.35	0.018	302.19	0.31	0.02	0.13	3.18	n/a	0.013	692	0.0296
12R	WWTP Roadway South Ditch Flow	14.21	0.722	174.56	11.31	0.72	0.66	5.18	n/a	0.013	1,992	0.0099
17R	Non-Contact Water Bypass Spillway	33.44	14.545	339.66	33.42	14.21	0.52	2.96	n/a	0.035	1,100	0.0127
19R	WWTP Roadway West Ditch Flow	5.57	0.283	265.45	5.16	0.28	0.43	5.84	n/a	0.013	574	0.0229
20R	WWTP Roadway East Ditch Flow	5.41	0.275	258.32	4.93	0.27	0.43	5.64	n/a	0.013	758	0.0216
21R	WWTP Combined Ditch Flow	177.78	6.537	307.20	113.34	6.53	1.28	13.25	n/a	0.013	442	0.0185
23R	Mining Ladown Roadway Ditch Flow	8.26	0.420	114.46	6.75	0.42	0.66	3.31	n/a	0.013	1,158	0.0042
26R	Main Road (West) Ditch Flow	35.14	1.786	174.11	21.57	1.76	0.85	6.07	n/a	0.013	4,921	0.0098
27R	Main Road (East) Ditch Flow	52.59	2.691	167.24	27.60	2.64	1.06	6.46	n/a	0.013	4,068	0.0091

Pond/ Sump	Description	Peak Elevation (ft)	Storage (af)	Inflow (cfs)	Inflow (af)	Outflow (cfs)	Outflow (af)	Pump Flow (cfs)	Pump Flow (gpm)
1P	Contact Water Pond	816.20	40.124	525.57	40.14	0.00	0.00	2.317	1,040
2P	Process Plant Area Contact Water (Sump 1	862.43	2.691	601.42	29.08	432.92	29.02	No Pump	No Pump
3P	Non-Contact Storm Water Ponds	826.70	53.968	1001.69	66.87	33.44	14.55	No Pump	No Pump
11P	Explosive Magazine (Sump 3)	n/a	n/a	32.78	1.67	n/a	n/a	32.78	14,714
24P	West Road North (Sump 4)	n/a	n/a	0.17	0.01	n/a	n/a	0.17	76
25P	NE Area (Sump 2)	n/a	n/a	47.01	4.89	n/a	n/a	47.01	21,101
1L	Contact Water Pond Discharge (Containme	n/a	n/a	0.00	0.00	n/a	n/a		
3L	Non-Contact Water Pond Discharge	n/a	n/a	33.42	14.21	n/a	n/a		
4L	Combined Ore Stockpiles Discharge	n/a	n/a	239.08	16.00	n/a	n/a		

Source: Appendix A, HydroCAD Stormwater Modelling Data
Type II 24-hour, 100-year, 24-hour Rainfall = 6.34 inches
af = acre feet
cfs = cubic feet per second
ft = feet
fps = feet per second
in = inch

Prepared by: BJS1
Checked by: BDS1

4.3 Water Balance Modeling

Water balance modeling using GoldSim software was based on the site-specific climate data summarized in Section 3 and design criteria for the Process Plant, TDF, and site-wide water management systems. Water balance flows were estimated at four time periods:

- Year 1 – Operations startup at 20 percent capacity and tailings slurry discharged to NP1
- Year 11 – Last year of tailings slurry discharge to NP1
- Year 12 – Startup of tailings discharge to NP2
- Year 26 – Last year of tailings slurry discharge to NP2

Annual average input data for the water balance are illustrated in the four water balance flow diagrams provided in Appendix B Figures B-1 through B-4 and *GoldSim Model Construction* (Foth; August 3, 2026).

Key water balance flows include:

- Site-specific contact water inflows based upon climate data provided by Foth.
- Process Plant water inflows and outflows provided by Ausenco.
- TDF water inflows and outflows provided by TetraTech.
- Water treatment plant inflows and treated water discharge flow to the environment derived from excess reclaim water from NP1 and NP2.

Key sources of annual average variability in the water balance flows for the four time periods evaluated include:

- an increase in ore processing rate and contact storm water flow area as mine operations ramp up during Years 1 through 3;
- change in rainfall collection area as tailings slurry discharge transitions from NP1 to NP2; and
- change in water treatment plant influent flow as the influent source transitions from NP1 alone to NP1 and NP2 combined.

More detailed illustrations of water balance flows are best illustrated using the GoldSim model outputs illustrated on 12 figures (B-5 through B-11) presented in Appendix B and GoldSim Model Construction (Foth; August 3, 2026).

4.3.1 Process Plant Inflows

Figure B-5 shows the return flow from concentrate and paste thickeners, and also reclaim water in tailings slurry outflow, increases during the first three years of plant operations and then levels off to relatively consistent flow rates of 1,835 cubic meter per hour (m^3/hr) (8,080 gallons per minute [gpm]) and 410 m^3/hr (1,800 gpm), respectively, from Year 3 to Year 26.

4.3.2 NP1 and NP2 TDF Inflows

Figures B-6 and B-8 illustrate NP1 and NP2 TDF inflows including slurry tailings water, underground mine water, net precipitation directly into NP1 or NP2, and contact water pumped

from the Contact Water Pond. Inflow from water in tailings slurry (440 m^3/hr; 1,900 gpm) and from underground mine water and equipment needs (up to 192 m^3/hr; 845 gpm) are relatively constant.

Due to variable rainfall throughout the year, net precipitation and flow from the Contact Water Pond varies with higher flows in the spring including snow melt and low flow in the winter while snow and ice accumulate. Inflow from Contact Water Pond (former Bidell Pond) discharge is estimated to vary from 0 to 185 m^3/hr (820 gpm) with an average annual flow of 65 m^3/hr (290 gpm). Estimated net monthly precipitation inflow to NP1 varied from 9 m^3/hr to 1,480 m^3/hr (40 gpm to 6,500 gpm) and to NP2 from 5 m^3/hr to 1,640 m^3/hr (20 gpm to 7,200 gpm).

4.3.3 Water Treatment Plant Inflow

Water treatment plant inflow fluctuates depending on the variability in net precipitation directly onto NP1 and NP2 and from the Contact Water Pond. Equalization of net precipitation and Contact Water Pond flow reduce the range of low and high inflow to the water treatment plant. Figure B-10 in Appendix B shows water treatment plant inflow generally between 230 m^3/hr and 510 m^3/hr (1,000 and 2,250 gpm) from Year 1 through Year 11 and between 300 m^3/hr to 1,020 m^3/hr (1,300 gpm and 4,500 gpm) from Year 12 through Year 26.

4.3.4 Short-term Variability in Net Precipitation

Short-term variability in net precipitation was evaluated in two ways:

- Statistical variability of precipitation minus evaporation for NP1 and NP2
- Design storm modeling of precipitation for the Contact Water Pond

Figures B-6a and B-8a in Appendix B illustrate the statistical variability of precipitation minus evaporation for NP1 and NP2. The range of annual minimum flows did not change significantly at the 10 percent (low) probability from the 50 percent probability, but annual maximum flows increase by approximately 340 m^3/hr (1,500 gpm) for the 90 percent (high) probability over the 50 percent probability for short durations.

The variability in Contact Water Pond inflow due to a design storm event was evaluated using the HydroCAD model as presented in Section 4.2. The Contact Water Pond is sized to contain runoff from the design storm event (100-year, 24-hour). To reduce the time to drain the Contact Water Pond to the target low operational level and to provide added resiliency for peak rainfall or snow-melt events, the maximum pumping rate from the Contact Water Pond resulting from a design storm event can increase by another 227 m^3/hr (1,000 gpm) for a total discharge flow of 454 m^3/hr (2,000 gpm).

4.3.5 Water Balance Effects Including Design Storm Events

GoldSim modeling was used to evaluate the effect of two design storm events on daily and monthly water balance flows. The deterministic 100-year, 24-hour storm event of 161 mm (6.34 inches) of precipitation was applied on May 1 in Year 8 (tailings placed in NP1) and August 1 in Year 15 (tailings placed in NP2). The GoldSim model water balance flow outputs are illustrated on Figures C-1 through Figure C-7 in Appendix C. The Process Plant to and from NP1 and NP2 are illustrated on Figure C-1, which remained unchanged despite the additional water inflow to NP1 and NP2 from two design storm events. The design storm event effects on the NP1 inflows are seen on Figure C-2, and on the NP2 inflows on Figure C-4.

Interestingly, other than the NP1 and NP2 inflows just described, the only general observable impact in the system is noticed by comparing the outflows shown on Figure C-7 for the (daily with storm) model in Appendix C to Figure B-11 of the previous (monthly average) model results in Appendix B. Adding in the 24-hour storm from Year 15 drives the NP1 outflow discharge to approximately 100 gpm during the second half of that year. Note that Year 15 is during the time the Process Plant is receiving water from NP2. The 24-hour storm in Year 8 (when the Process Plant is receiving water from NP1) doesn't drive the NP1 outflow discharge noticeably higher than that observed without the storm event.

Runoff was not allowed to enter the NP2 in the model until Year 12, therefore the Year 8 storm event doesn't have an effect on the NP2 outflow. When the Process Plant is receiving water from NP2 in Year 15, noticeable outflow discharge from the storm event was not observed.

5. Contact Water Pond

Design criteria for management of contact and non-contact water are presented in this section. The primary objective of the Contact Water Pond is to contain contact storm water.

5.1 Flow Paths

The water balance for the Contact Water Pond is evaluated in Appendix A. The Contact Water Pond will receive water from:

A. Direct precipitation
B. Runoff from the contact storm water runoff areas
C. Non-contact storm water areas within the Southeast Watershed

The Contact Water Pond will discharge water to:

A. NP1 TDF (Years 0 to 11)
B. NP2 (Years 12 to 26 to minimize inflows to NP1 and expedite closure)
C. The atmosphere as evaporation

5.2 Contact Water Pond Design Criteria

With the design storm events described in Section 3.3 in mind, an evaluation of the capacity of the Contact Water Pond to manage a storm event was performed using the design storm event. The results of the evaluation are summarized as Contact Water Pond design criteria in Table 5-1. The evaluation concluded that the Contact Water Pond storage capacity as reflected by contact water drainage from the areas illustrated on Drawing Nos. WM-04 and WM-07 (57,000 cubic meters [m^3]; 46.4 acre feet [af]) is sufficient to contain water from the 100-year, 24-hour storm event maintaining 3 feet of freeboard. A period of 200 hours (8.4 days) and pumping rate of 295 m^3/hr (1,300 gpm) would be required to remove the contact water contained in the Contact Water Pond after the 100-year, 24-hour storm event.

Table 5-1
Contact Water Pond Design Criteria

Parameter	Value	Unit	Source and Notes
Storage Capacity	2,000,000	ft^3	Volume at maximum water level with 1 m freeboard
	57,000	m^3	
Maximum Daily Influent	187,000	gpm	Design 100-year, 24-hour Storm
	42,500	m^3/hr	
Discharge Pumping Capacity	1,300	gpm	Pumped flow to discharge operating capacity in 8.4 days
	295	m^3/hr	
Freeboard	3.28	feet	Height from maximum water elevation to top of berm (Drawing No. WM-08)
	1.0	m	

ft^3 = cubic feet

Prepared by: BDS1
Checked by: BJS1

5.3 Process Plant Area Contact Water Sump Design Criteria

With the design storm events described in Section 3.3 in mind, an evaluation of the capacity of the Process Plant Area Contact Water Sump to manage a storm event was performed using the design storm event. The results of the evaluation are summarized as Process Plant Area

Contact Water Sump design criteria in Table 5-2. The evaluation concluded that the Process Plant Area Contact Water Sump storage capacity is illustrated on Drawing Nos. WM-02 and WM-12 (4,300 m^3; 3.5 af) is insufficient to contain water from the 100-year, 24-hour storm event maintaining 3 feet of freeboard. A period of 24 hours (1 day) and pipeline flow rate of 180 m^3/hr (793 gpm) would be required to remove the contact water contained in the sump during the 100-year, 24-hour storm event.

Table 5-2
Process Plant Area Contact Water Sump Design Criteria

Parameter	Value	Unit	Source and Notes
Storage Capacity	152,000	ft^3	Volume at maximum water level with 1 m freeboard
	4,300	m^3	
Maximum Daily Influent	270,000	gpm	Design 100-year, 24-hour Storm
	61,300	m^3/hr	
Discharge Capacity	793	gpm	Gravity flow to discharge design storm runoff in 1 day
	180	m^3/hr	
Freeboard	3.28	feet	Height from maximum water elevation and outflow invert to top of berm (WM-06)
	1.0	m	

Prepared by: BDS1
Checked by: BJS1

5.4 Non-Contact Water Ponds Design Criteria

With the design storm events described in Section 3.3 in mind, an evaluation of the capacity of the Non-Contact Water Ponds to manage a storm event was performed using the design storm event. The results of the evaluation are summarized as Non-Contact Water Ponds design criteria in Table 5-3. The evaluation concluded that the Non-Contact Water Ponds storage capacity as reflected by non-contact water drainage from the areas illustrated on Drawing No. WM-02 (66,300 m^3; 53.7 af) is insufficient to contain water from the 100-year, 24-hour storm event maintaining 3 feet of freeboard. Thus, a bypass channel has been proposed to discharge storm water from a design storm water event at or below the estimated maximum daily flow. A period of 24 hours (1 day) would be required to discharge the storm water flow into the Non-Contact Water Ponds during the 100-year, 24-hour storm event.

Table 5-3
Non-Contact Water Ponds Design Criteria

Parameter	Value	Unit	Source and Notes
Storage Capacity	2,340,000	ft^3	Volume at maximum water level with 1 m freeboard
	66,300	m^3	
Maximum Daily Influent	447,200	gpm	Design 100-year, 24-hour Storm
	101,600	m^3/hr	
Discharge Capacity	447,200	gpm	Gravity flow to and through bypass channel when ponds are at capacity.
	101,600	m^3/hr	
Freeboard	3.28	feet	Height from maximum water elevation and outflow invert to top of berm (Drawing No. WM-08)
	1.0	m	

Prepared by: BDS1
Checked by: BJS1

6. Summary of Storm Water Management

The following sections provide a summary of work for the main water management elements.

6.1 Construction

The key elements of the WMS construction include:

- Storm Water Permitting by Contractor
- Procure Long-Lead Equipment
- Contractor Mobilization
- Perform Initial Site Work
- Construct Bypass Channel
- Build Roadways
- Install Site Piping, Ditches, and Sumps
- Install Process Plant Area Contact Water Sump Liner System and Complete Process Area Contact Water Sump Construction
- Pump Down Existing Bedell Pond and Remove Sediment
- Install Contact Water Pond Liner System and Complete Contact Water Pond Construction
- Receive Equipment and Install Pump Stations

Material quantity take offs for the water management systems are listed in Table 6-1.

Contact water is not generated until the Contact Water Pond has been constructed and is operational. During construction, contact water from the ore stockpiles and Process Plant Area is collected in the Contact Water Pond and pumped from the Contact Water Pond to NP1.

Non-contact storm water during construction (and throughout the LOM), can be discharged to the environment after sediment removal through a typical Best Management Practices (BMP) approach. The existing Non-Contact Water Ponds location, the proposed BMP approach, is shown on Drawing Nos. WM-02 and WM-05.

6.2 Operations

6.2.1 Contact Water Management

Normally, the Contact Water Pond volume will be kept at a minimum (~30 percent of design capacity). There will be temporary water level increases with storm events, and the resulting contact storm water will be pumped out within 8.4 days following a storm using a series of two operating pumps each capable of pumping 148 m^3/hr (650 gpm). Pumped contact storm water will discharge to NP1.

6.2.2 Non-Contact Water Management

Non-contact storm water throughout the LOM is typically discharged to the environment after sediment removal through the existing non-contact storm water surge pond and wetlands treatment cells. This existing BMP approach is shown on Drawing Nos. WM-02 and WM-05.

Table 6-1
Material Quantity Take Offs - Water Management Systems

COMMODITY CODE DESCRIPTION	Quantity	Units	Drawing Reference	Comment
Earthwork				
Clear & Grub	10	Hectares	WM-07, WM-10	Contact Water and Non-Contact Water Pond & Sumps; Non-Contact Water Bypass
Type 1 Bulk excavation in common earth	23,573	m3	WM-07, WM-10	Contact Water and Non-Contact Water Pond Upgrades; Non-Contact Water Bypass
Backfill Type 1 - Common - Place & Compact	15,279	m3	WM-07, WM-10	All subgrade backfill material for roadways (exc. SubBase+Base), ponds, and bypass
Ditching (0.7 m deep x 0.75 m wide - 0.525 m2)	9,672	m3	WM-04, -07, -09	Ditching along roadways except where culverts are installed
Asphalt Ditch Liner (5.08 cm; 2 inch)	28,997	m2	WM-09	Asphalt liner in all ditches carrying contact water
Riprap R-150 (ASTM D6092) (Riprap around all pipe inlets and outlets)	207	m3	WM-10	Pipeline inlet and outlet structures
Culverts and Pipelines				
Culvert - 20" dia HDPE (16 culverts @ 15 m long)	240	m	WM-10	Culverts only; constructed during roadway and ditch installation
Culvert - 48" dia HDPE (2 culverts @ 24 m long)	48	m	WM-10	Dual 1219 mm (48-inch) culverts beneath roadway east of Contact Water Pond
Pipeline - 72" dia HDPE (from Sump 1)	1,242	m	WM-10	Used for gravity flow pipe from SE Area (Sump 1); 1829 mm (72-inch) HDPE
Pressure Pipelines - 24" dia HDPE (Sumps 2, 3, and 5)	958	m	WM-10	Used for all areas where piping is installed, except culverts; 24-inch HDPE pressure piping
Pressure Pipelines - 4" dia HDPE (Sump 4)	122	m	WM-10	Used for all areas where piping is installed, except culverts; 24-inch HDPE pressure piping
Liner Systems for Contact Water Pond, Sump 2, and Sump 3				
Sand/Gravel Ballast Layer, 12-inch, Pond Bottom Area	22,788	m2	WM-13	Used for all Contact Water Ponds and Sumps unless Sump is entirely concrete structure
Geotextile, Nonwoven, 16 oz/yd3	22,788	m2	WM-13	Used for all Contact Water Ponds and Sumps unless Sump is entirely concrete structure
HDPE Geomembrane Liner (60 mil) - Doubled sided Textured	22,788	m2	WM-13	Used for all Contact Water Ponds and Sumps unless Sump is entirely concrete structure
Anchor Trench	873	m	WM-12, -13, -14	Used for all Contact Water Ponds and Sumps unless Sump is entirely concrete structure
HDPE Geomembrane Pipe Boots	8	Ea	WM-12, -13, -14	Used for all Contact Water Ponds and Sumps unless Sump is entirely concrete structure
Reinforced Geosynthetic Clay Liner	22,788	m2	WM-12, -13, -14	Used for all Contact Water Ponds and Sumps unless Sump is entirely concrete structure
Sump Wet Well, Access Manway, Pumps, Level Switch/Sensor &Pressure Gauge				
Contact Water Pond Discharge to NP1	1	each	WM-12, -13, -14	Leak testing, sump and scuff sheet materials, perforated pipig, collection trench
Northeast Area Discharge to Contact Water Pond (Sump 2)	1	each	WM-6, WM-15	Two 6,000-gpm pumps @ 30 ft TDH
Explosives Magazine Contact Water Discharge to Contact Water Pond (Sump 3)	1	each	WM-7, WM-15	Two 5,000-gpm pumps @ 26 ft TDH
Portal Area Contact Water Discharge to Northeast Area Sump (Sump 4)	1	each	WM-7, WM-15	Two 150-gpm pumps @ 25 ft TDH
Contractor Facilities/Shotcrete Plant (Sump 5)	1	each	WM-7, WM-15	Two 6,000-gpm pumps @ 30 ft TDH
Mechanical Installation	1	each	WM-15	Mechanical for all 4 pumping systems (Sumps 2,3,4 and 5)
Electrical Installation	1	LS		Electrical for all 5 pumping systems (Contact Water Pond and Sumps 2,3,4 and 5)

Prepared by: BDS1
Checked by: BJS1

Treated non-contact storm water flows out of Wetland Cell #3 and into a bypass channel that discharges to the Bedell Pond drainageway downgradient of the Contact Water Pond.

A non-contact water bypass structure redirects non-contact storm water discharge above the 100-year, 24-hour design storm into the bypass channel. This prevents washout of the culvert and roadway crossing between the Surge Pond and Wetland Cell #1.

6.2.3 Emergency Overflow Strategy

Freeboard above this maximum water level will be provided to account for future rain events. If an extreme situation occurs such that the water level rises to the overflow level in the Contact Water Pond, a second storm water pump is activated when the Contact Water Pond reaches a preset high level directing additional flow 148 m^3/hr (650 gpm) to NP1.

6.3 Snow Management Strategy

There are times when relocating snow will be necessary to manage excess quantities and ensure safe driving and working conditions. There are several environmental concerns regarding relocating excess snow from operations areas, access roads, and parking lots. Contaminants present in snow cleared from contact areas including the Process Plant Areas and ore stockpiles can include heavy metals and sediment. Implementation of proper BMPs can prevent or reduce the discharge of pollutants to non-contact surface waters and groundwater during snowmelt. Relocating snow in Michigan is regulated under various statutes including Part 31, Water Resources Protection of the Natural Resources and Environmental Protection Act (EGLE, 2024).

The following tips will help guide decisions on relocating snow:

- Store snow at least 50 feet from a groundwater monitoring well.
- Select sites that drain to retention ponds or sumps and capture pollutants.
- Segregate snow from contact areas and non-contact areas.

For stockpiling snow, avoid:

- Relocating snow from contact areas directly in non-contact surface waters.
- Wetlands and floodplains as these areas are especially sensitive to excess water.
- Areas with steep slopes or readily erodible soils.
- Areas with a human physical exposure risk (e.g., operational access walkways).
- Stockpiled ore which enhances flushing of heavy metals to storm water.
- Access areas to critical utilities in case of an emergency (e.g., water main breaks).

Snow generated from facility operating areas, access roads, and other surface areas designated as contact areas shall be managed as contact storm water in solid form. Snow from these areas may contain sediment and metals and must therefore be segregated from non-contact areas and hydraulically routed to the site Contact Water Management System upon melt. The snow management strategy is designed to support safe winter operations while maintaining regulatory compliance under Michigan Part 31 and the facility NPDES permitting framework.

Snow management at the site is based on the recognition that winter snow accumulation represents deferred contact water storage. Snow water equivalent values of 0.10 are utilized for planning purposes; however, storage capacity is conservatively sized to accommodate

worst-case single accumulation events with limited reliance on mid-winter melt. Snow relocation and storage practices are intended to maintain clear travel ways, preserve meltwater flow paths, and prevent uncontrolled releases to non-contact drainage areas.

6.3.1 Dedicated Contact Snow Storage Pads

Dedicated contact snow storage areas (snow storage pads) will serve as the primary method for managing snow removed from roadways and constrained operating areas. These snow storage pads will be located within existing contact drainage areas and graded to direct meltwater to existing contact storm water sumps or directly to the Contact Water Pond. Pads will be constructed on lined or low-permeability surfaces and will include positive surface drainage, low push-berms or containment features on down-gradient edges, and sufficient access for winter snow handling equipment. Storage capacity will be designed to accommodate at least one full winter of accumulated snow without reliance on intermittent melt events.

6.3.2 Snow Placement Directly into Contact Water Ponds or Sumps

Where feasible, snow will be placed directly into existing contact water ponds or sumps that are operated with sufficient freeboard to accommodate seasonal snow storage. This practice directly incorporates snow volume into the site water balance and avoids the creation of intermediate storage areas. Placement of snow in ponds will be managed to protect liners, piping, and hydraulic structures, and to maintain safe access and freeboard throughout winter operations.

6.3.3 Hauling Snow to Designated Snow Storage Areas

In areas with limited space, snow removed from roadways will be periodically hauled to designated contact snow storage pads or contact ponds. Snow hauling routes and storage locations will be pre-identified, and snow relocation will be treated as a planned operational activity rather than an emergency response. Snow handling practices will be adjusted as needed to minimize worker safety risks and equipment conflicts during winter operations.

Roadside storage of contaminated snow is avoided where it would obstruct designed meltwater flow paths or restrict drainage to contact storm water sumps. In limited locations where snow windrows are necessary, they will be placed behind shallow containment berms and adjacent to defined swales or trench drains to preserve hydraulic connectivity and prevent uncontrolled meltwater dispersion.

Snow from non-contact areas will be managed separately and will not be commingled with contact snow. Under no circumstances will snow from contact areas be intentionally placed in non-contact drainage areas, wetlands, or natural surface waters. All snow management activities will be coordinated with the Storm Water Pollution Prevention Plan, Soil Erosion and Sediment Control Plan, and Pollution Incident Prevention Plan, and will be refined as operating experience is gained over the LOM.

6.4 Closure and Post-Closure

The key elements of the WMS closure and post-closure include:

- General Storm Water Controls during Reclamation

- Removal and On-site Disposal of Roadway and Other Graveled Surfaces and Pond and Sump Sludge
- Removal of Liners, Piping, and Pumps
- Grading and Revegetation
- Maintenance of Long-term Storm Water Drainage and Erosion and Sediment Controls

7. References

Ausenco, 2025. *Site Conditions Design Criteria.* November 2025.

Michigan Department of Environment, Great Lakes, and Energy, 2024. Snow Removal Guidance, Municipal Separate Storm Sewer Systems (MS4) Program. Michigan Department of Environment, Great Lakes, and Energy (Michigan.gov/EGLE). April 2024.

Michigan Department of Environmental Quality, 1999. *Storm Water Management Guidebook*, Ch. 6, p. 47. August 1999.

Foth Infrastructure & Environment, LLC, 2025. Water Management Design Criteria Report. December 23, 2025.

Foth Infrastructure & Environment, LLC, 2026. GoldSim Model Construction (Foth; August 3, 2026).

Drawings

PERMIT APPLICATION

WATER MANAGEMENT DESIGN
WHITE PINE COPPER

ONTONAGON COUNTY, MICHIGAN

AUGUST 2026

Prepared by:
Foth Infrastructure & Environment, LLC



LOCATION MAP



VICINITY MAP

DRAWING INDEX

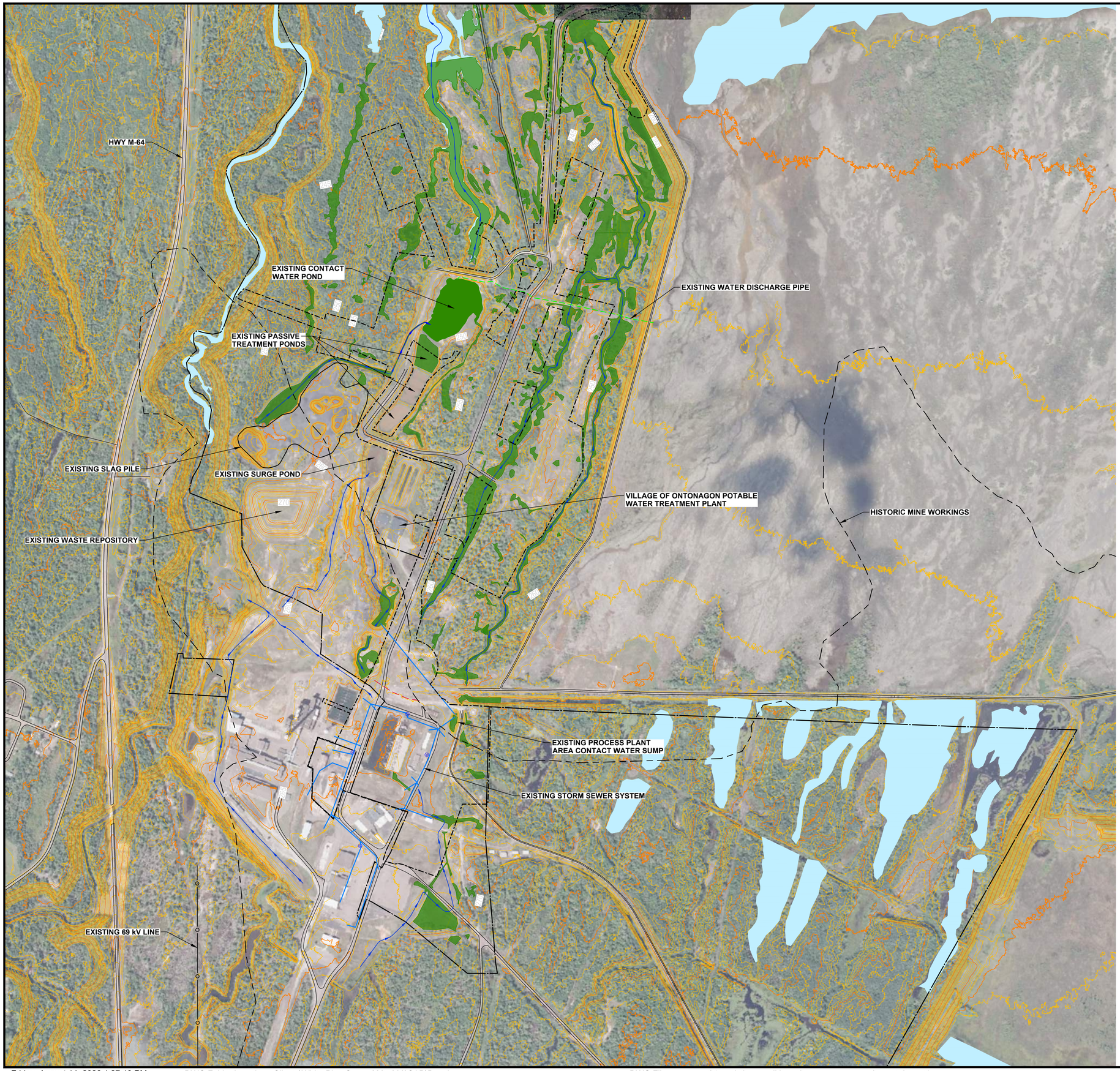
SHEET NUMBER	TITLE
WM-00	COVER SHEET & DRAWING INDEX
WM-01	EXISTING CONDITIONS
WM-02	GENERAL SITE LAYOUT
WM-03	WATERSHEDS
WM-04	CONTACT AND NON-CONTACT AREAS
WM-05	EROSION CONTROL PLAN
WM-06	PROCESS PLANT AREA CONTACT WATER SUMP PLAN & PROFILE
WM-07	CONTACT WATER POND & BYPASS CHANNEL PLAN
WM-08	CONTACT WATER POND & BYPASS CHANNEL PROFILES
WM-09	ROAD PROFILES
WM-10	PIPING PLAN LAYOUT
WM-11	PIPING PROFILES
WM-12	DETAILS
WM-13	DETAILS
WM-14	CONTACT WATER POND DETAILS
WM-15	SUMP STATIONS #2, #3 AND #5 DETAILS
WM-16	SUMP STATION #4 DETAILS

SHEET TITLE:
COVER SHEET & DRAWING INDEX

ISSUANCE:
PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER
WM-00



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PROPERTY SUBAREA
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING WATER DISCHARGE PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND

NOTES:

1. BASE AIR PHOTO FROM BING MAPS.
2. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY BASE MAP OBTAINED FROM AUSENCO BASED ON LIDAR SURVEY. CONTOUR INTERVAL = 0.25 METERS.

50 0 50 100 150 200 250 300 350 400 450 500m

SCALE

WHITE PINE COPPER

Foth

WATER MANAGEMENT DESIGN

WHITE PINE COPPER
ONTONAGON COUNTY, MICHIGAN

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

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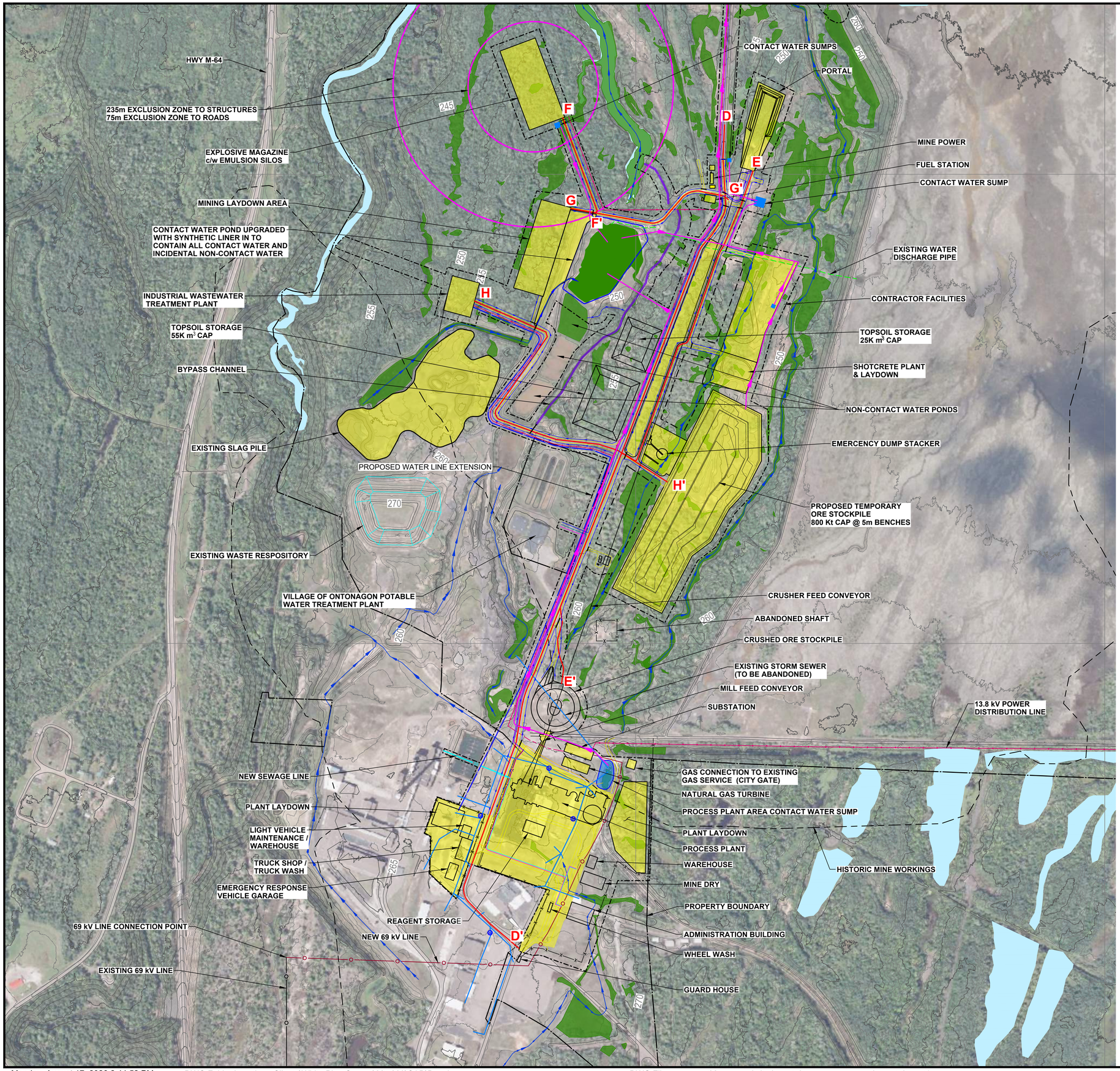
EXISTING CONDITIONS

PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

WM-01



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PROPERTY SUBAREA
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- EXISTING WATER DISCHARGE PIPE
- PROPOSED ROAD
- EXISTING / PROPOSED SITE FEATURES
- NEW 13.8kV UNDERGROUND LINE
- NEW 13kV OH LINE
- NEW 69kV LINE
- PROPOSED WATER LINE
- NEW DISCHARGE PIPE
- PROPOSED CONTACT WATER POND
- PROPOSED BYPASS CHANNEL
- PROPOSED CULVERT
- PROPOSED SUMP
- PROPOSED DRAINAGE DITCH
- PROPOSED DISCHARGE PIPING
- ROAD PROFILE LOCATIONS

NOTES:

1. BASE AIR PHOTO FROM BING MAPS.
2. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
3. HYDROGRAPHIC FROM USGS.
4. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
5. TOPOGRAPHY FROM _ . CONTOUR INTERVAL = 1'.

50 0 50 100 150 200 250 300 350 400m

SCALE

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ONTONAGON COUNTY, MICHIGAN

REVISIONS	NO.	BY	DATE	DESCRIPTION
	1			
	2			
	3			
	4			
	5			

DATE OF PREPARATION

	BY	DATE
SURVEYED		
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DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

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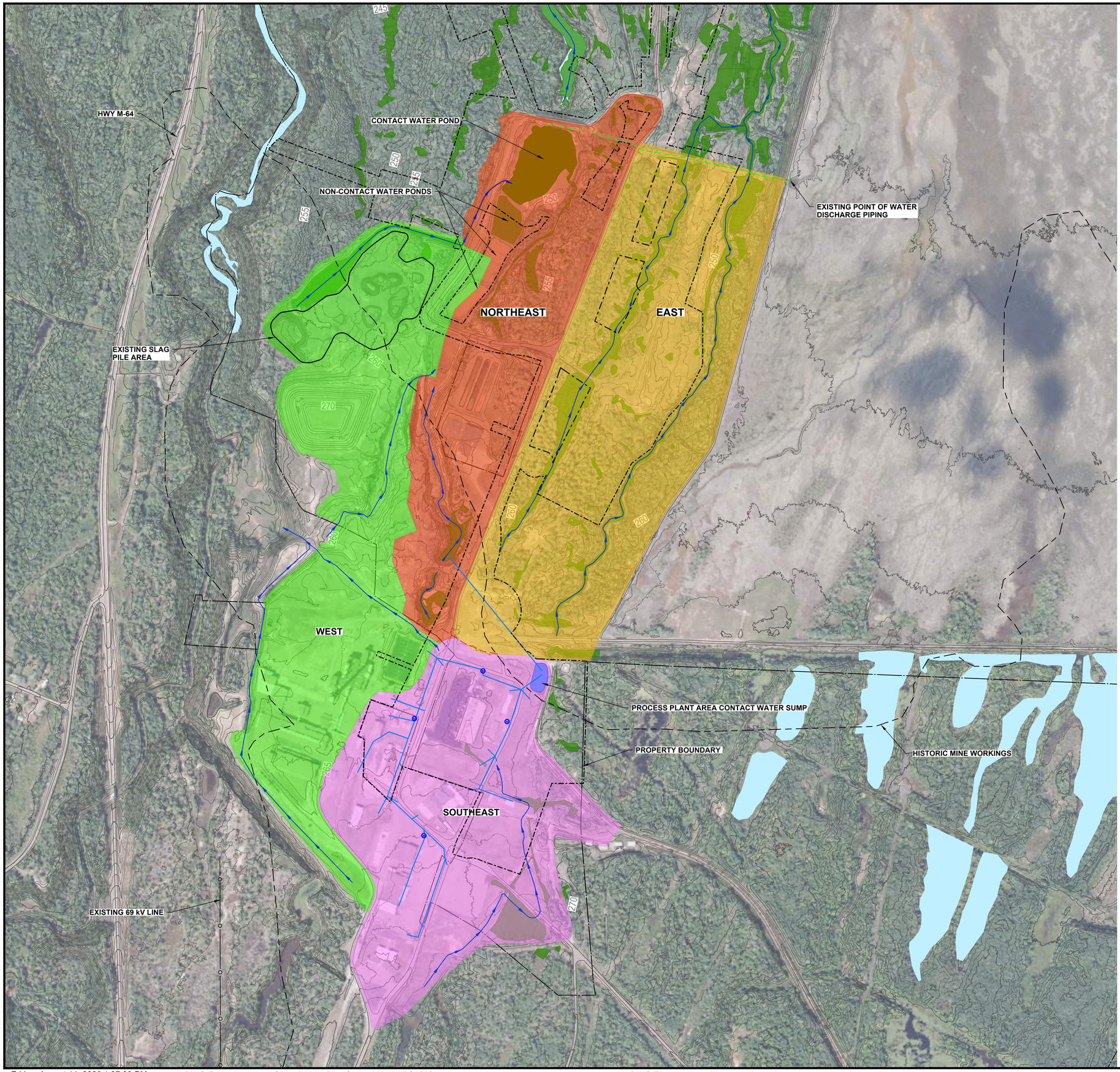
GENERAL SITE LAYOUT

PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

WM-02



LEGEND

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- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PROPERTY SUBAREA
- EXISTING ROADWAY
- EXISTING ELECTRIC
- EXISTING WATER DISCHARGE PIPE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- EXISTING NORTHEAST WATERSHED AREA
- EXISTING SOUTHEAST WATERSHED AREA
- EXISTING WEST WATERSHED AREA
- EXISTING EAST WATERSHED AREA

NOTES:

1. BASE AIR PHOTO FROM BING MAPS.
2. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
3. HYDROGRAPHIC FROM USGS.
4. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
5. TOPOGRAPHY BASE MAP OBTAINED FROM AUSENCO BASED ON LIDAR SURVEY. CONTOUR INTERVAL = 0.25 METERS.

50 0 50 100 150 200 250 300 350 400m
SCALE

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WATER MANAGEMENT DESIGN

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REVISIONS	NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

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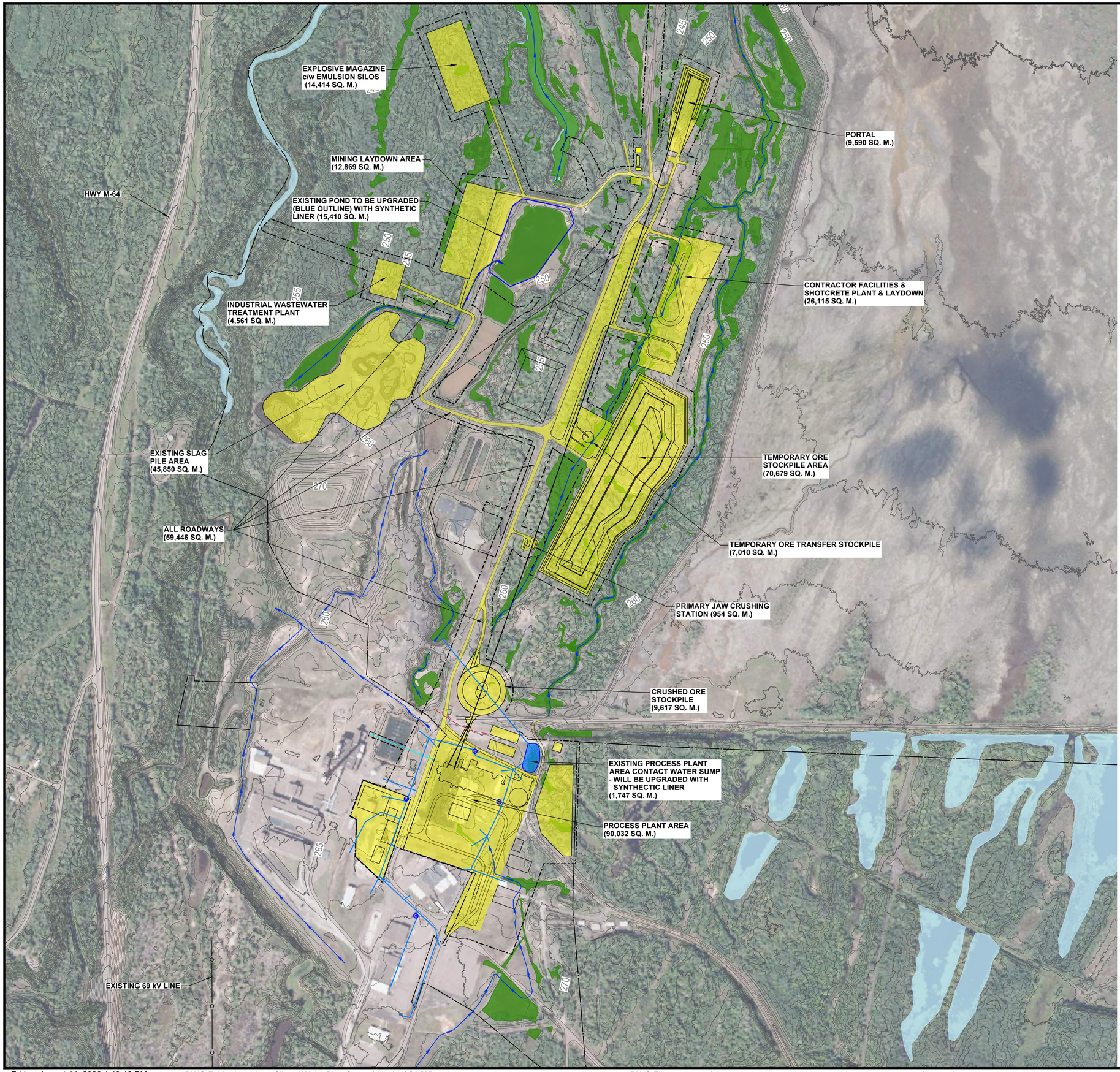
WATERSHEDS

PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

WM-03



LEGEND

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- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PROPERTY SUBAREA
- EXISTING ROADWAY
- EXISTING ELECTRIC
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- CONTACT WATER AREA

NOTES:

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4. TOPOGRAPHY BASE MAP OBTAINED FROM AUSENCO BASED ON LIDAR SURVEY. CONTOUR INTERVAL = 0.25 METERS.

50 0 50 100 150 200 250 300 350 400m
SCALE

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	BY	DATE
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DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

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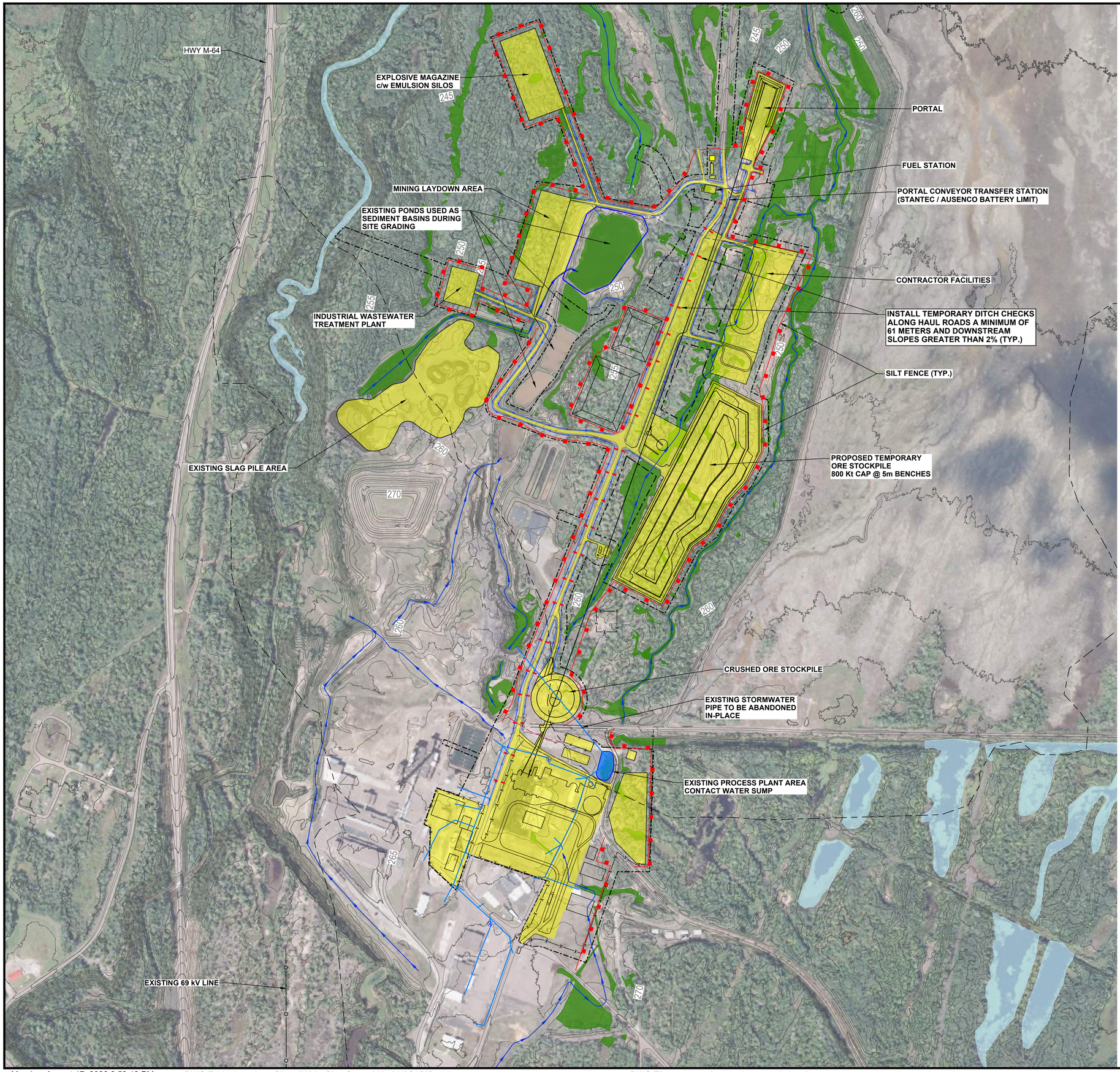
CONTACT AND NON-CONTACT AREAS

PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

WM-04



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PROPERTY SUBAREA
- EXISTING ROADWAY
- EXISTING ELECTRIC
- EXISTING WATER DISCHARGE PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING / PROPOSED DITCH LOCATION
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- CONTACT AREA
- PROPOSED TEMPORARY DITCH CHECKS
- PROPOSED SILT FENCE

NOTES:

1. BASE AIR PHOTO FROM BING MAPS.
2. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY BASE MAP OBTAINED FROM AUSENCO BASED ON LIDAR SURVEY. CONTOUR INTERVAL = 0.25 METERS.

50 0 50 100 150 200 250 300 350 400m

SCALE

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REVISIONS			
NO.	BY	DATE	DESCRIPTION

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SURVEYED		
DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

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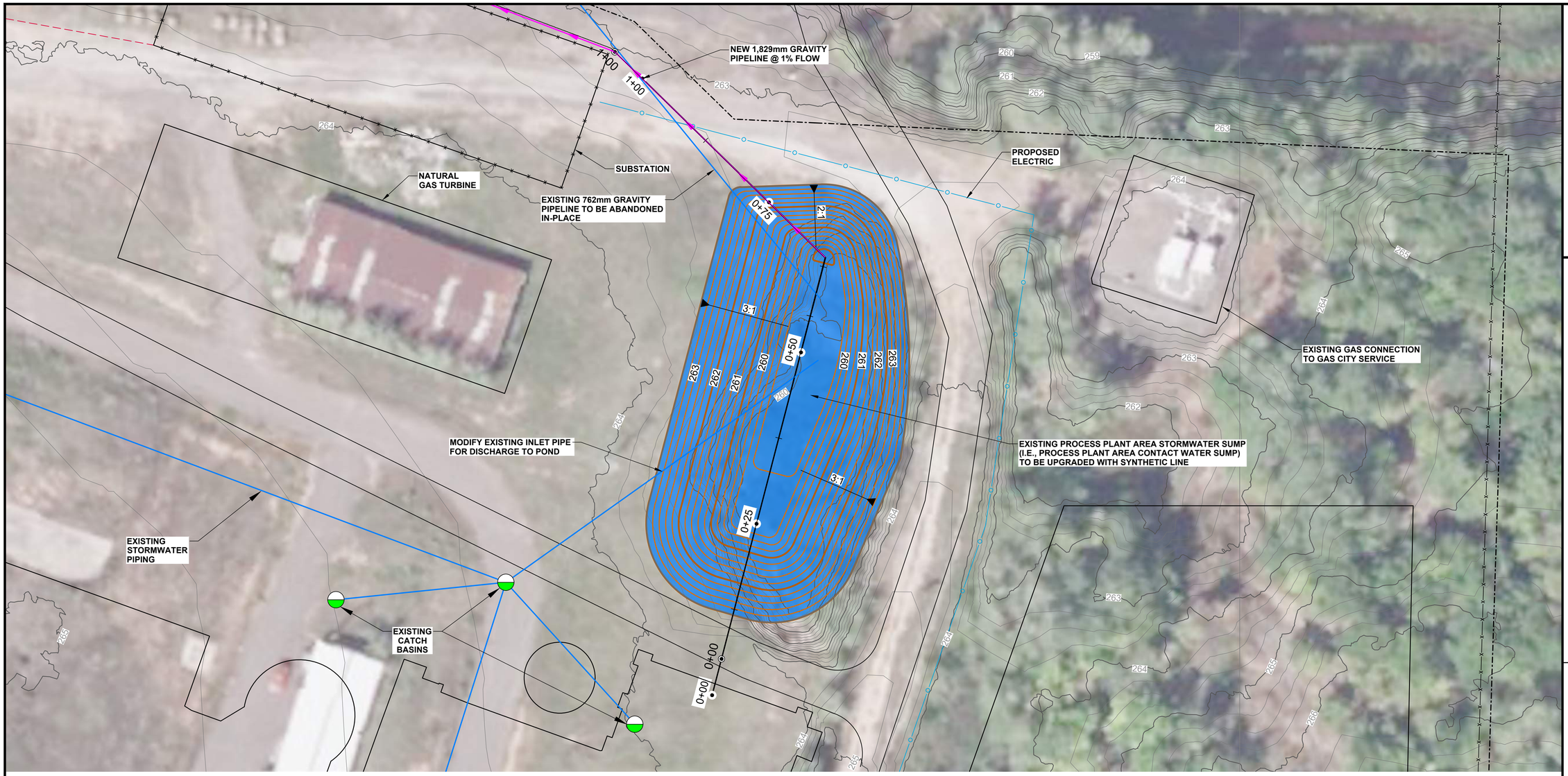
EROSION CONTROL PLAN

PERMIT APPLICATION

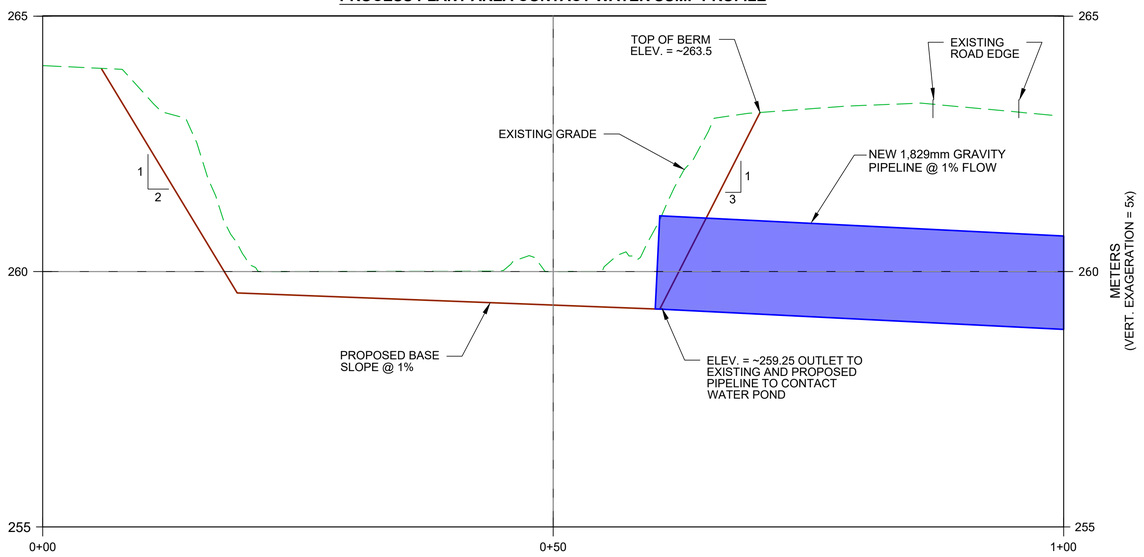
PROJECT NO: 23W200

SHEET NUMBER

WM-05



PROCESS PLANT AREA CONTACT WATER SUMP PROFILE



METERS
0 3.75 7.5 15
SCALE

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DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

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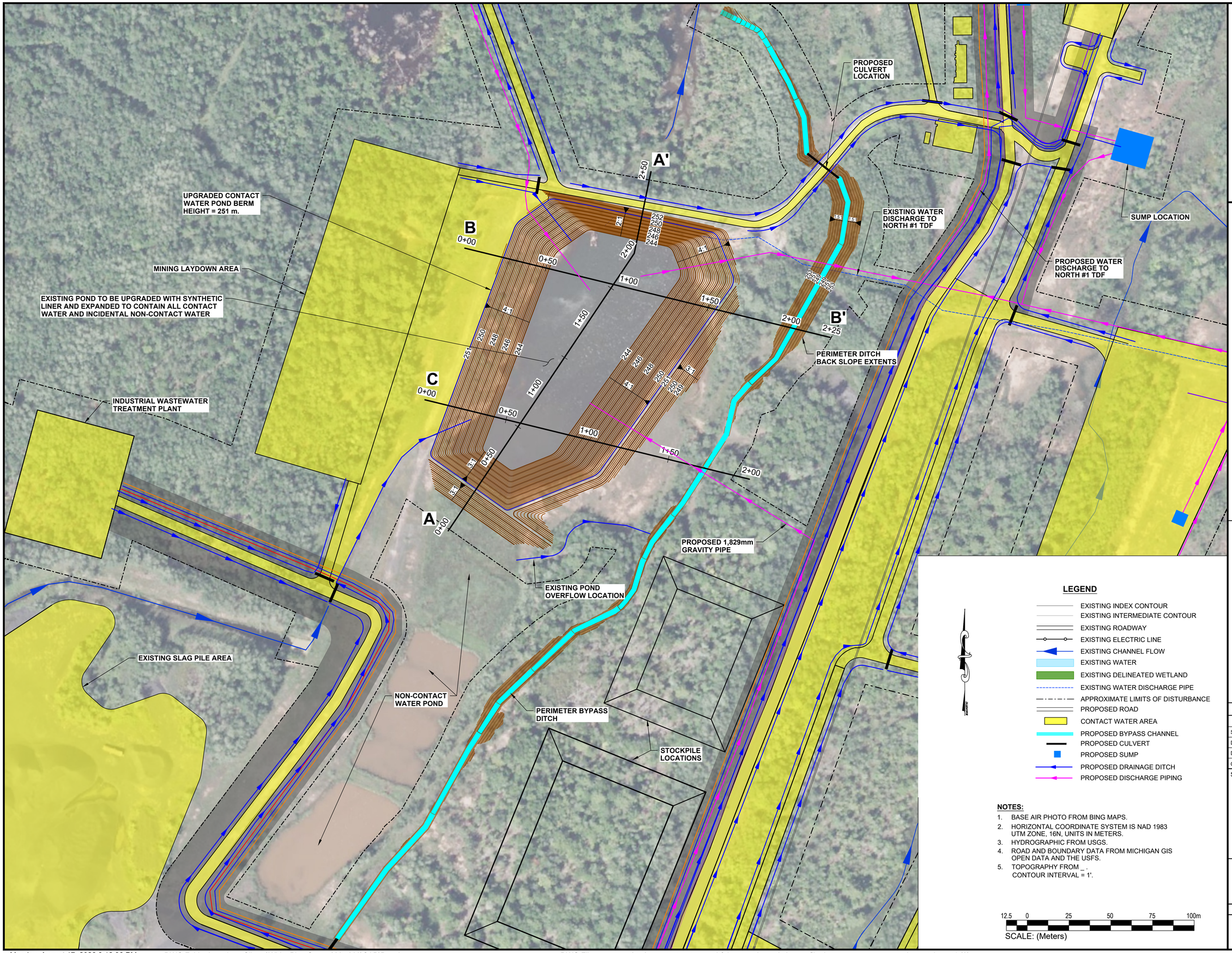
PROCESS PLANT AREA CONTACT WATER SUMP PLAN AND PROFILE

PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

WM-06



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- EXISTING WATER DISCHARGE PIPE
- APPROXIMATE LIMITS OF DISTURBANCE
- PROPOSED ROAD
- CONTACT WATER AREA
- PROPOSED BYPASS CHANNEL
- PROPOSED CULVERT
- PROPOSED SUMP
- PROPOSED DRAINAGE DITCH
- PROPOSED DISCHARGE PIPING

NOTES:

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3. HYDROGRAPHIC FROM USGS.
4. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
5. TOPOGRAPHY FROM _ . CONTOUR INTERVAL = 1'.

12.5 0 25 50 75 100m

SCALE: (Meters)

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REVISIONS			
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DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

SHEET TITLE:

CONTACT WATER POND & BYPASS CHANNEL PLAN

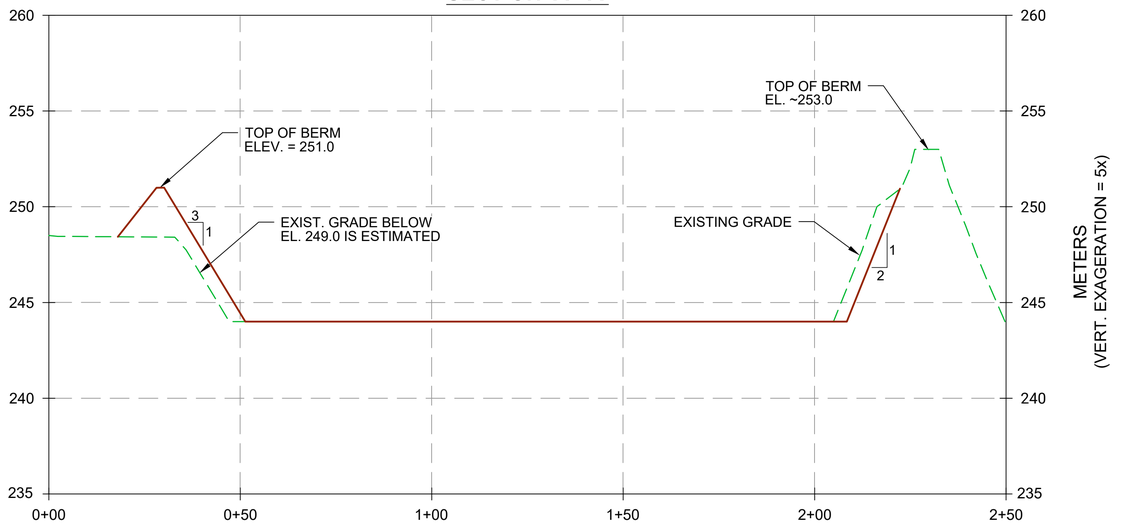
PERMIT APPLICATION

PROJECT NO: 23W200

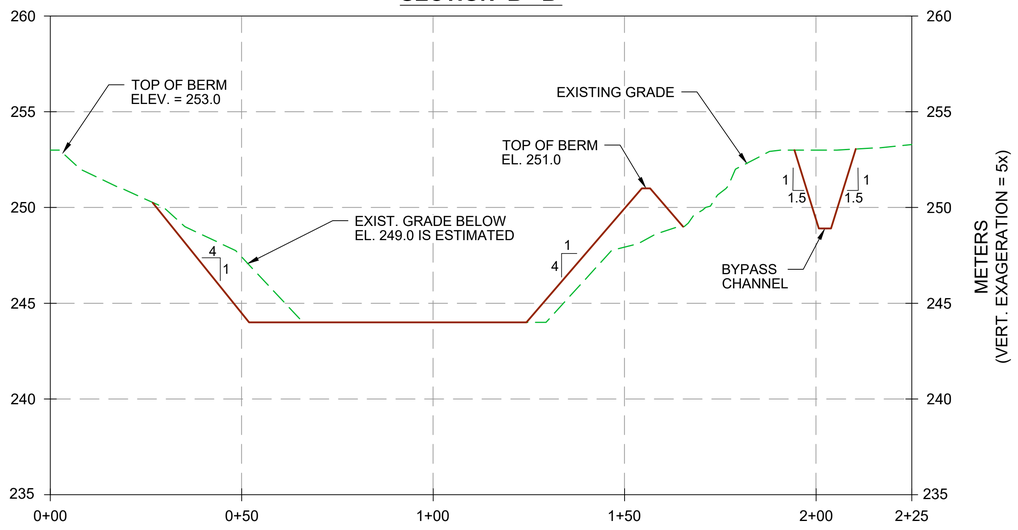
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WM-07

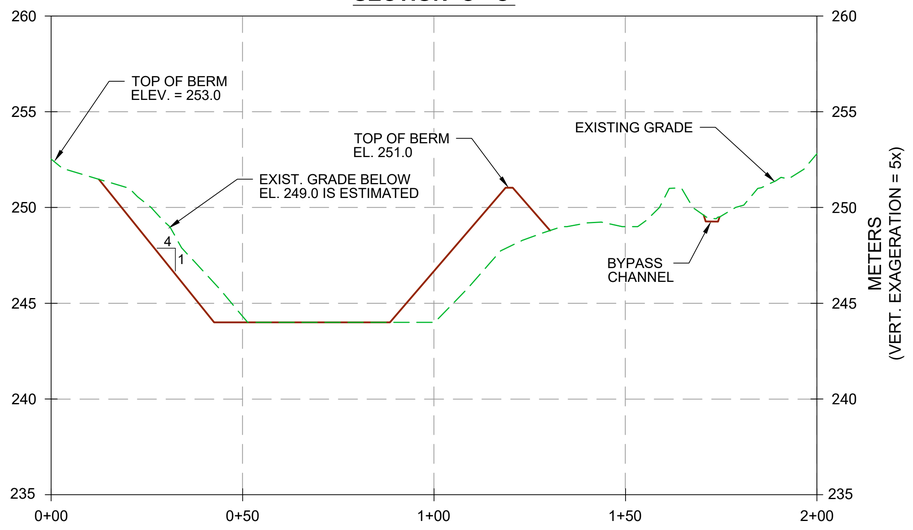
SECTION A - A'



SECTION B - B'



SECTION C - C'



METERS
0 10 20 40
SCALE

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WATER MANAGEMENT DESIGN

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ONTONAGON COUNTY, MICHIGAN

REVISIONS	NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
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DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

SHEET TITLE:

CONTACT WATER POND & BYPASS CHANNEL PROFILES

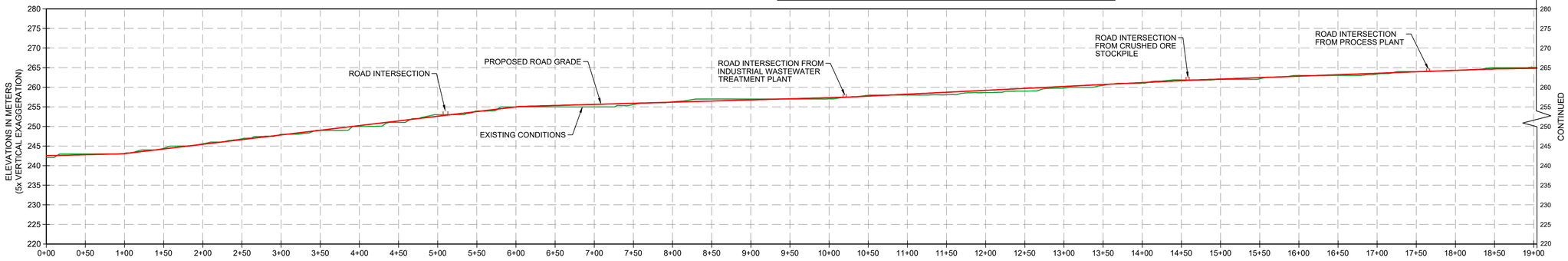
PERMIT APPLICATION

PROJECT NO: 23W200

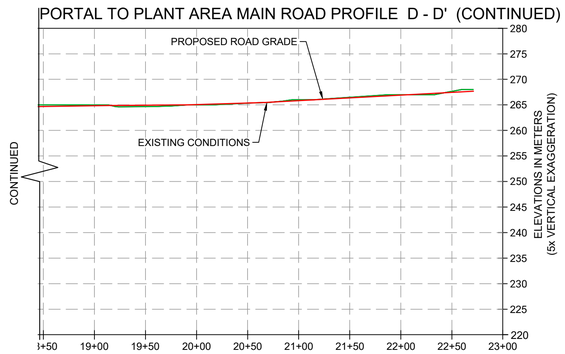
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WM-08

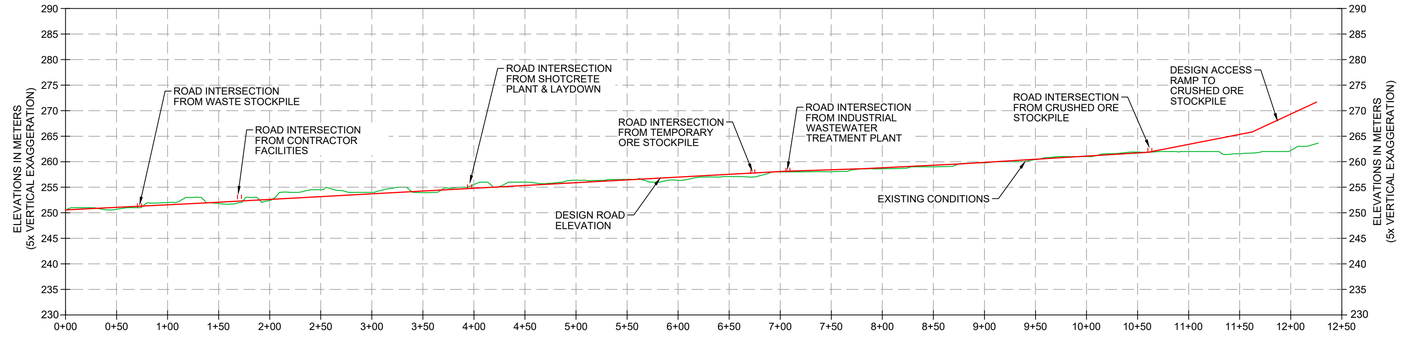
PORTAL TO PLANT AREA MAIN ROAD PROFILE D - D'



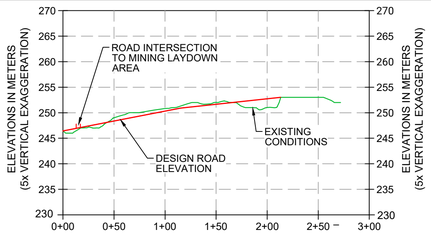
PORTAL TO PLANT AREA MAIN ROAD PROFILE D - D' (CONTINUED)



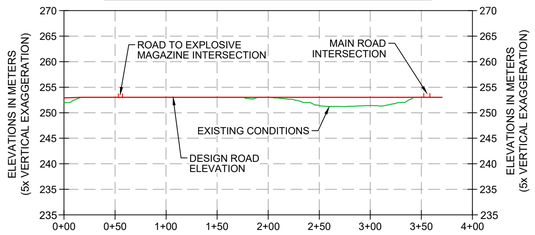
PORTAL TO CRUSHED ORE STOCKPILE E - E'



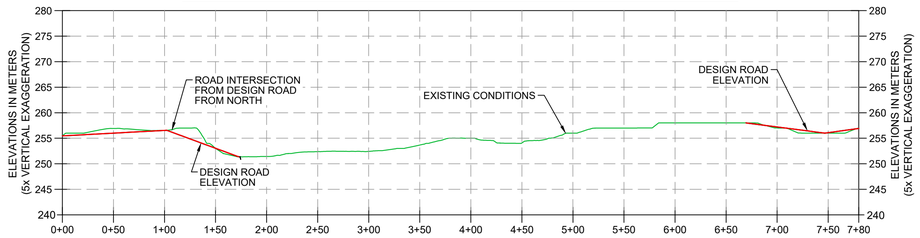
EXPLOSIVE MAGAZINE TO MINING LAYDOWN ACCESS ROAD F - F'

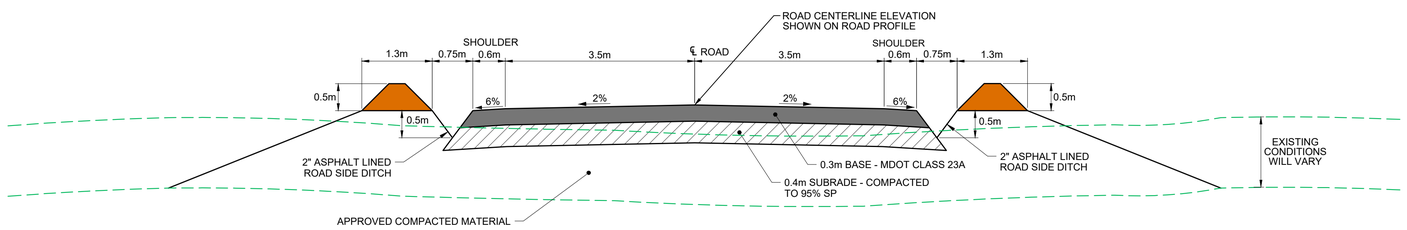


LAYDOWN AREA TO MAIN ROAD G - G'



INDUSTRIAL WASTEWATER TREATMENT PLANT TO TEMPORARY ORE STOCKPILE H - H'





1 / WM-9 **ACCESS ROAD TYPICAL CROSS-SECTION (CONTACT AREAS)**
SCALE: NONE

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WATER MANAGEMENT DESIGN

WHITE PINE COPPER
ONTONAGON COUNTY, MICHIGAN

REVISIONS	NO.	BY	DATE	DESCRIPTION
	1			
	2			
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	5			
	6			

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

SHEET TITLE:

ROAD PROFILES

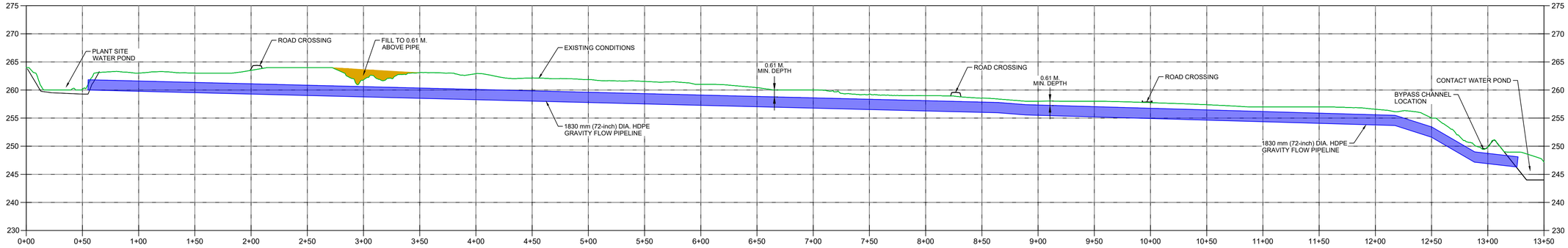
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PROJECT NO: 23W200

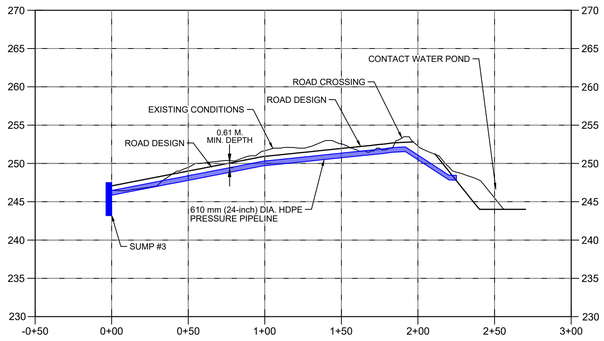
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WM-09

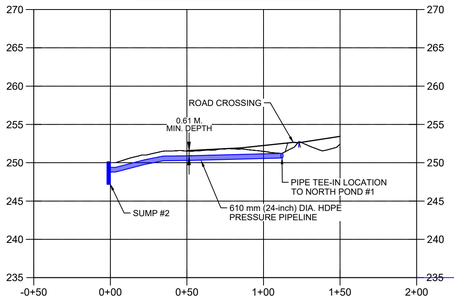
PIPELINE FROM PROCESS PLANT AREA CONTACT WATER SUMP TO CONTACT WATER POND I - I'



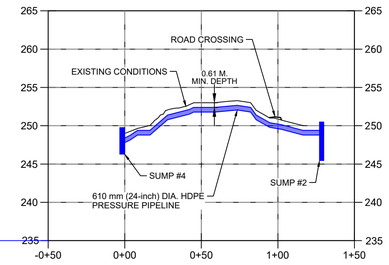
EXPLOSIVE MAGAZINE SUMP 3 TO CONTACT WATER POND J - J'



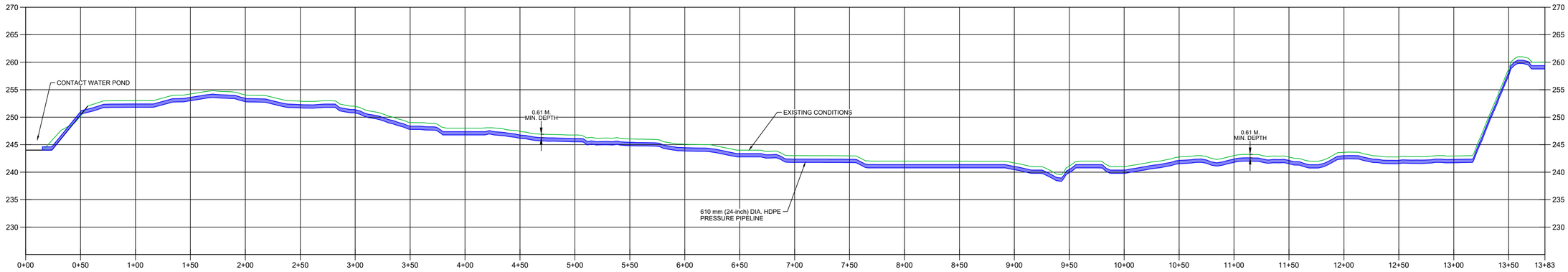
SUMP 2 TO PIPE TIE-IN K - K'



SUMP 4 MINE POWER AREA TO SUMP 2 L - L'



CONTACT WATER POND TO NORTH #1 TDF RECLAIM WATER POND M-M'



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	BY	DATE
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DRAWN	JRB2	AUGUST 2026
DESIGNED	BDS1	AUGUST 2026
CHECKED	BDS1	AUGUST 2026

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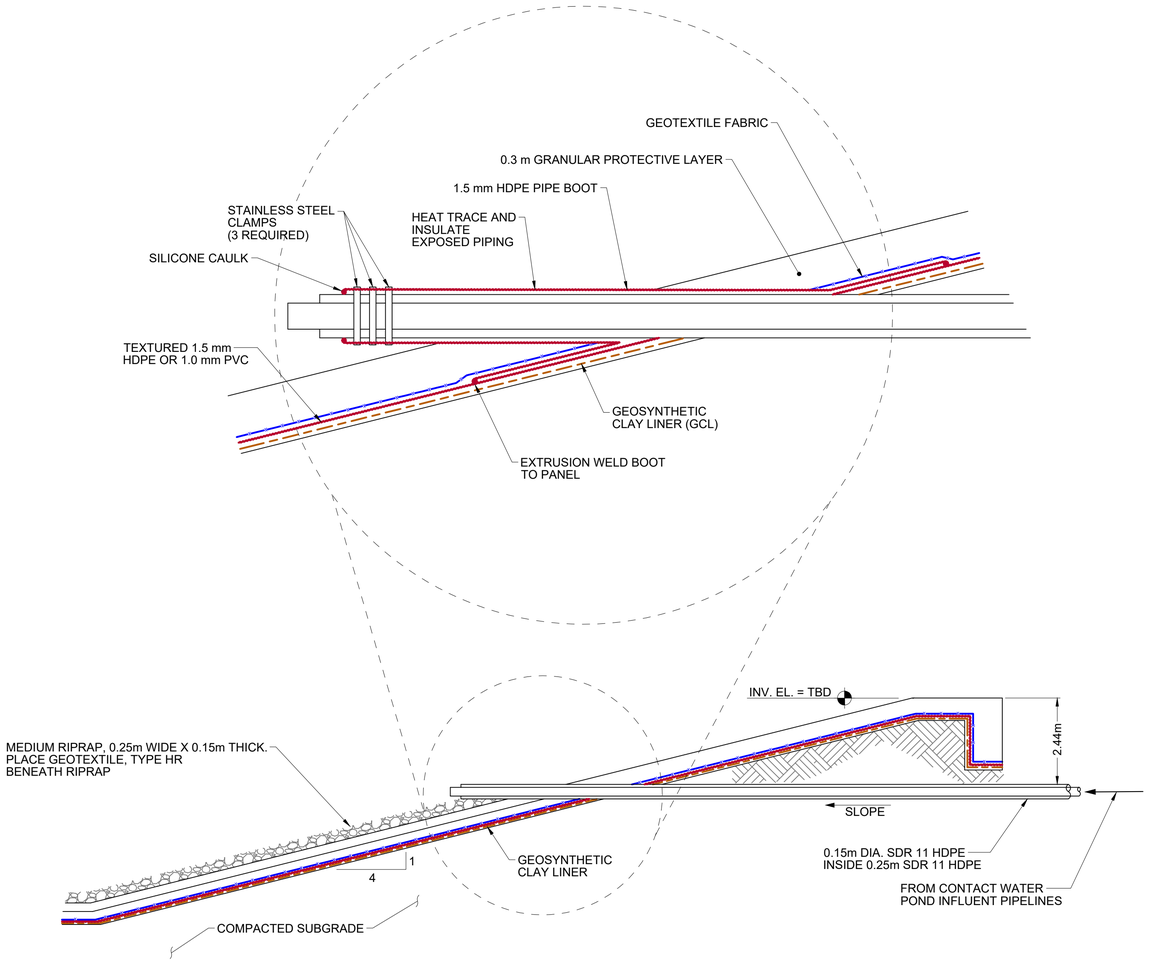
PIPING PROFILES

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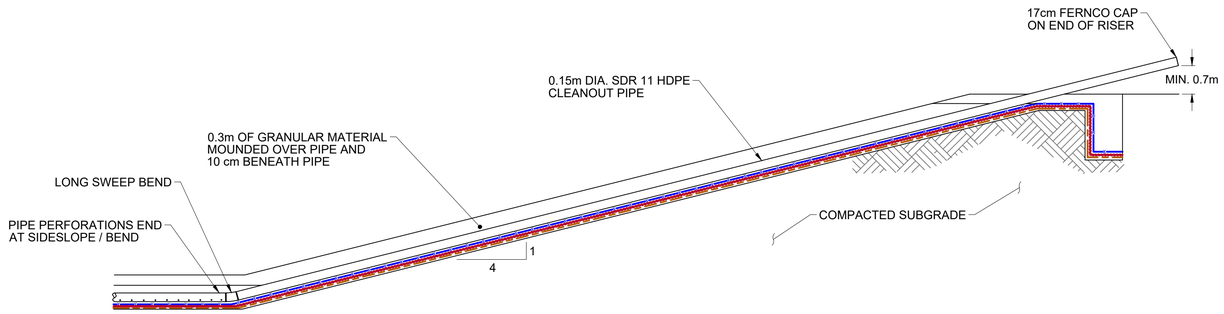
PROJECT NO: 23W200

SHEET NUMBER

WM-11



1 / WM-12 **TYPICAL CONTACT WATER POND DISCHARGE PIPE**
SCALE: NONE



2 / WM-12 **TYPICAL CLEANOUT**
SCALE: NONE

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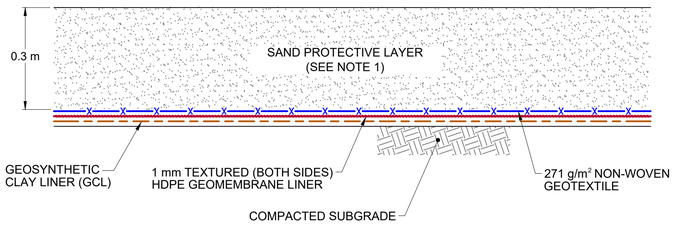
DETAILS

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SHEET NUMBER

WM-12

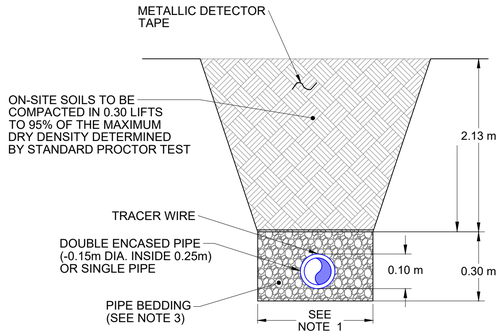


NOTE:

1. SAND SHALL BE LESS THAN 3.81cm PARTICLE SIZE AND P200 < 5%

1 / WM-13 **TYPICAL CONTACT WATER POND LINER DETAIL**

SCALE: NONE

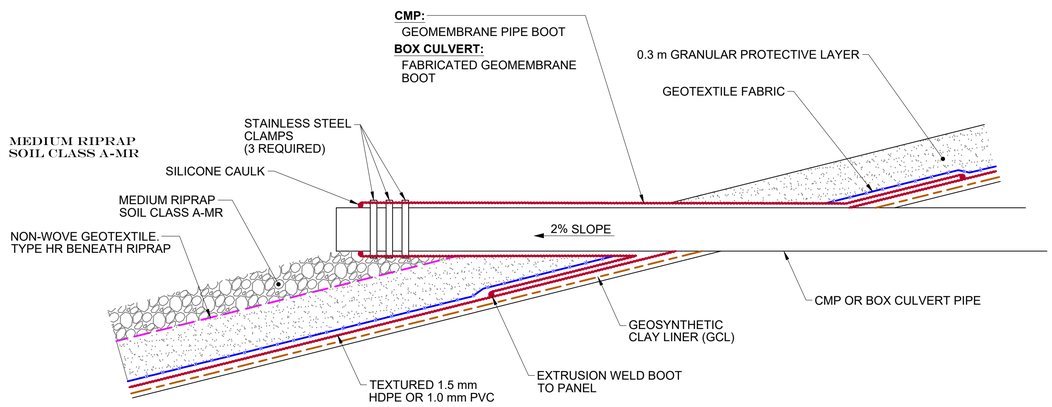


NOTES:

1. TRENCH WIDTH MEASURED AT THE TOP OF THE PIPE SHALL BE 0.46m MIN. FOR 0.1m AND 0.15m MAINS AND 0.61m FOR 0.20m AND 0.25m MAINS.
2. EACH NEW BURIED WATER LINE SHALL HAVE A BLUE #18 INSULATED TRACER WIRE ATTACHED TO IT SECURELY AT 2.44m O.C. AND SHALL HAVE 0.30 OF TRACER WIRE ACCESSIBLE ABOVE GRADE AT THE TERMINATION AND BE SECURELY ATTACHED AT THAT POINT.
3. BEDDING AND SELECTED BACKFILL TO BE OBTAINED FROM ON-SITE SAND STOCKPILES HAVE A MAXIMUM PARTICLE SIZE OF LESS THAN 0.15 INCH.

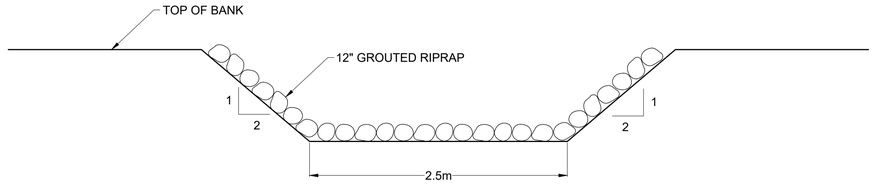
2 / WM-13 **TYPICAL TRENCH SECTION FOR BURIED PIPELINES**

SCALE: NONE



3 / WM-13 **TYPICAL CMP OR BOX CULVERT PIPE LINER PENETRATION**

SCALE: NONE



4 / WM-13 **NON-CONTACT WATER BYPASS CHANNEL**

SCALE: NONE

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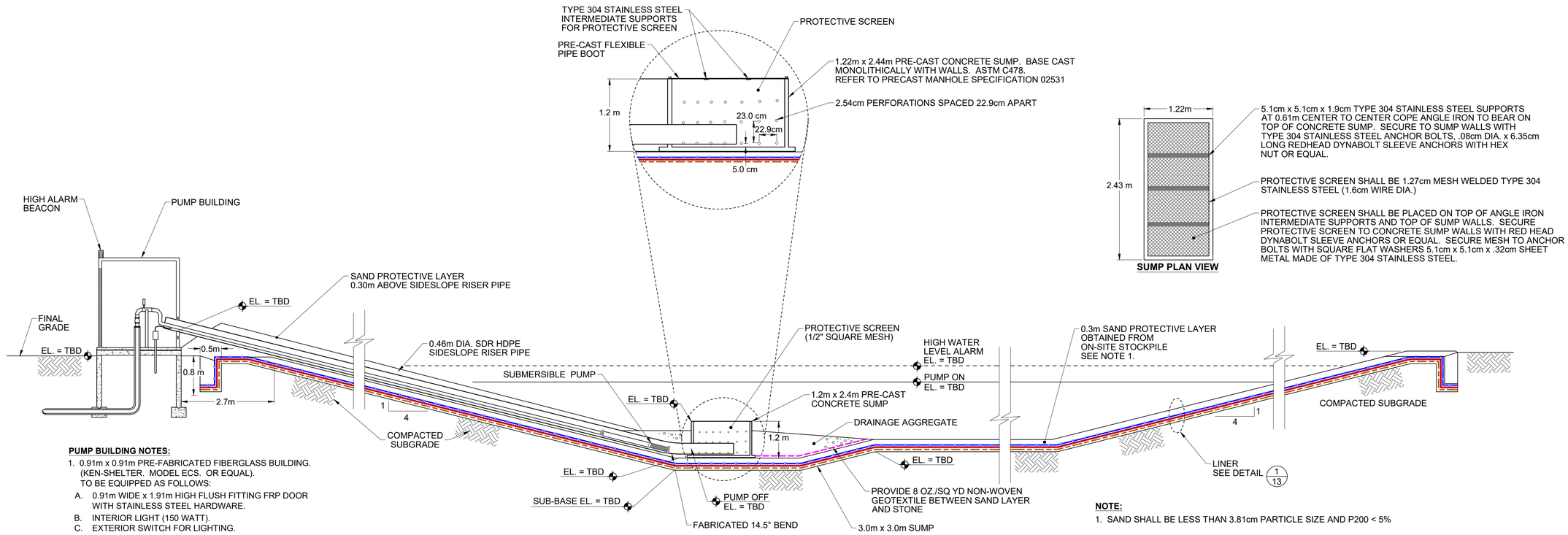
DETAILS

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WM-13



PUMP BUILDING NOTES:

1. 0.91m x 0.91m PRE-FABRICATED FIBERGLASS BUILDING. (KEN-SHELTER. MODEL ECS. OR EQUAL). TO BE EQUIPPED AS FOLLOWS:
   - A. 0.91m WIDE x 1.91m HIGH FLUSH FITTING FRP DOOR WITH STAINLESS STEEL HARDWARE.
   - B. INTERIOR LIGHT (150 WATT).
   - C. EXTERIOR SWITCH FOR LIGHTING.
   - D. GRAVITY OPERATED AIR INTAKE VENT.
   - E. THERMOSTATICALLY CONTROLLED HEATER E. TO MAINTAIN INTERIOR TEMPERATURE ABOVE 40'F.
   - F. COLOR BY OWNER.
   - G. EXTERIOR PUMP ALARM LIGHT.
   - H. ONE STANDARD OUTLET; 120V, 20A.
   - I. REINFORCE BUILDING WALLS AT ALL PUMP CONTROL PANEL LOCATIONS AND PIPE PENETRATIONS.
   - J. CONTRACTOR SHALL INSTALL SLEEVES IN CONCRET SLAB AND WALLS FOR PIPE AND ELECTRICAL CONDUIT PENETRATIONS.

NOTE:

1. SAND SHALL BE LESS THAN 3.81cm PARTICLE SIZE AND P200 < 5%

1 / WM-14 **CONTACT WATER POND SUMP**

SCALE: NONE

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CHECKED	BDS1	AUGUST 2026

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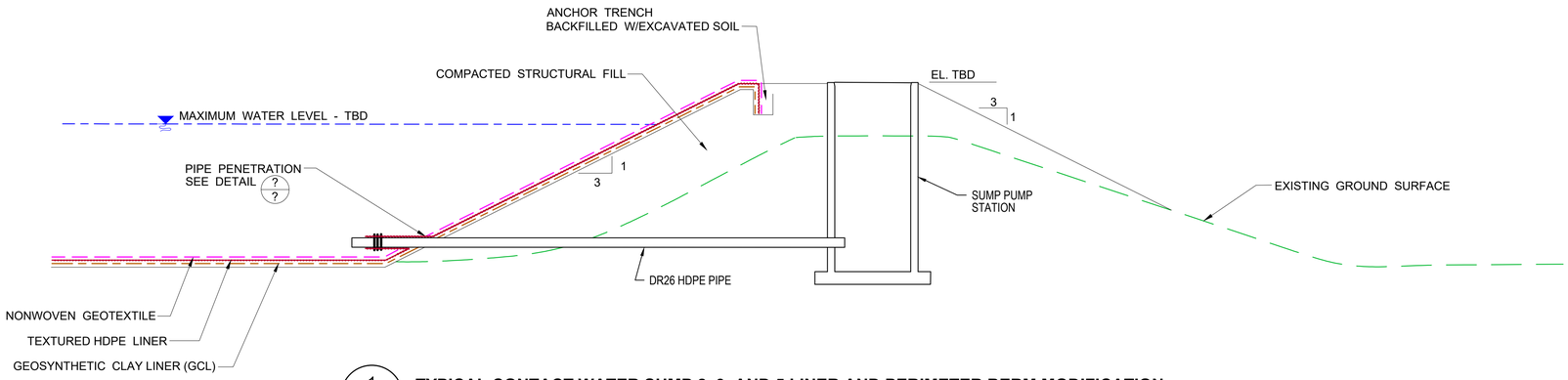
CONTACT WATER POND SUMP DETAIL

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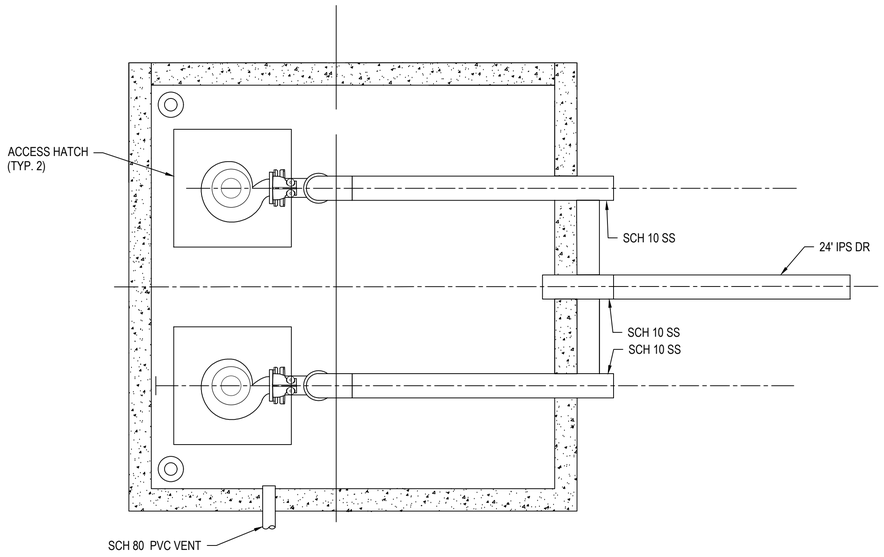
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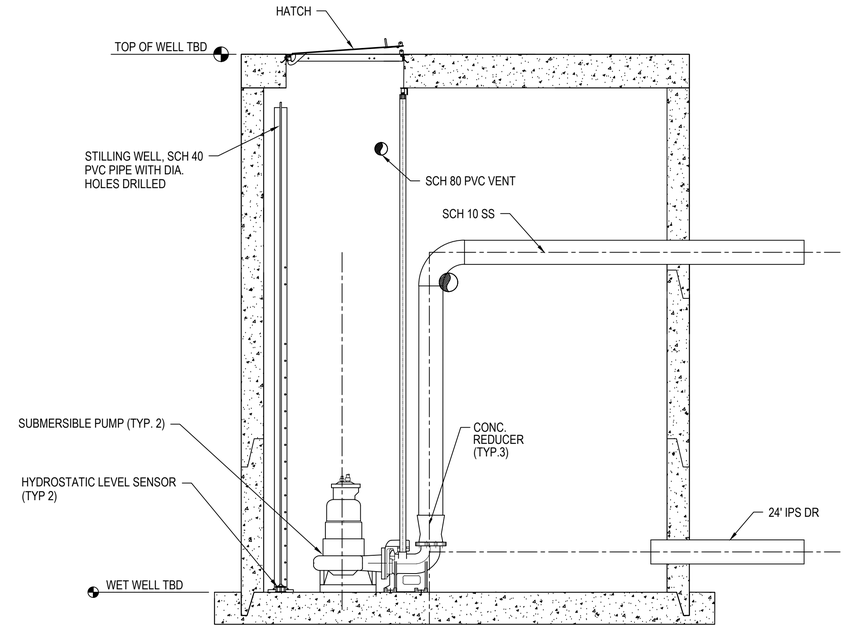
WM-14



1 / WM-15 **TYPICAL CONTACT WATER SUMP 2, 3, AND 5 LINER AND PERIMETER BERM MODIFICATION**
SCALE: NONE



2 / WM-15 **SUMP STATIONS 2, 3 AND 5**
SCALE: NONE



3 / WM-15 **SUMP STATIONS 2, 3 AND 5**
SCALE: NONE

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DESIGNED	RGB2	AUGUST 2026
CHECKED	RGB2	AUGUST 2026

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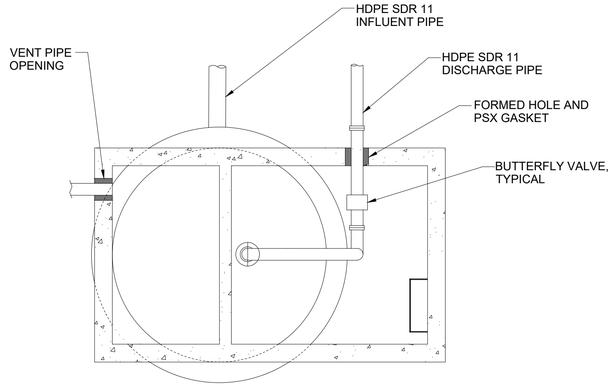
SUMP STATIONS #3 & #5 DETAILS

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SHEET NUMBER

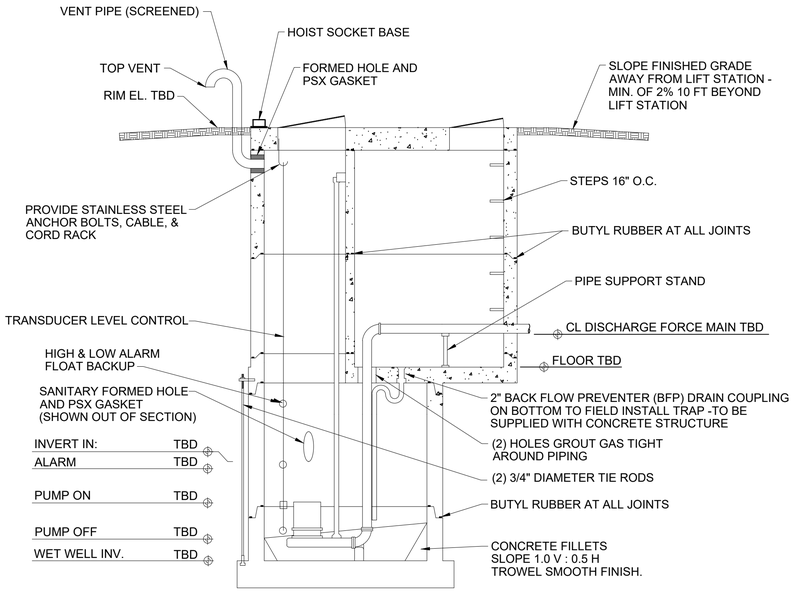
WM-15



PLAN VIEW

NOTE:
1) ALL INTERNAL PIPING TO LIFT STATION AND VALVE BOX SHALL BE HDPE SDR 11.

1 / WM-16 **SUMP #4 STATION - PLAN VIEW**
SCALE: NONE



2 / WM-16 **SUMP #4 STATION - SECTION VIEW**
SCALE: NONE

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DESIGNED	RGB2	AUGUST 2026
CHECKED	RGB2	AUGUST 2026

SHEET TITLE:

SUMP STATION #4 DETAILS

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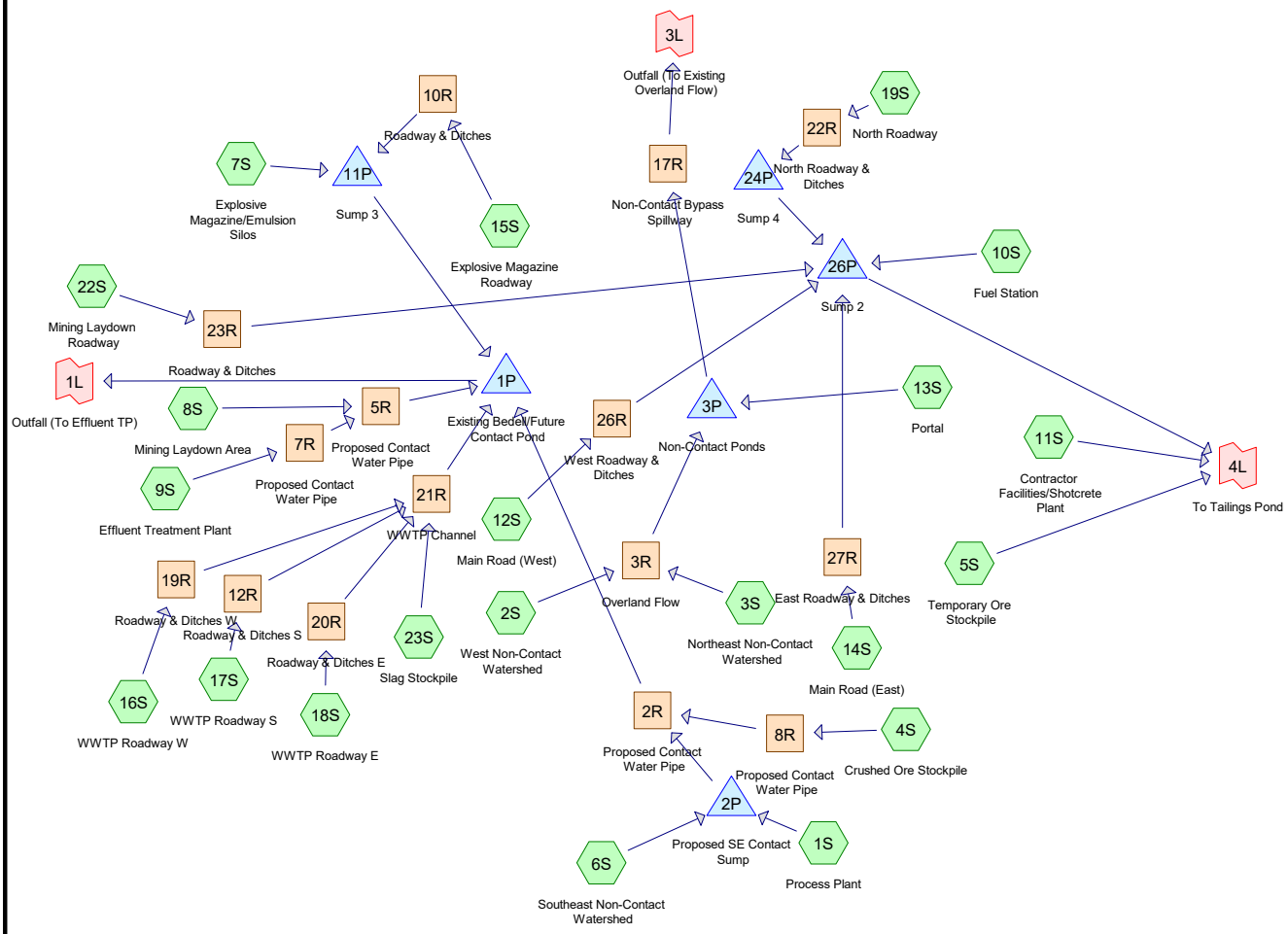
PROJECT NO: 23W200

SHEET NUMBER

WM-16

Appendix A

HydroCAD Storm Water Modeling Data



Routing Diagram for White Pine Copper_Contact Areas_English_20260410, Revised 04/09/2026

Prepared by Foth & Van Dyke, LLC, Printed 4/10/2026

HydroCAD® 10.20-5c s/n 02551 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
23.390	98	Paved parking, HSG C (2S)
13.320	98	Paved roads w/curbs & sewers, HSG C (12S, 14S, 15S, 16S, 17S, 18S, 19S, 22S)
68.790	98	Unconnected pavement, HSG C (2S, 3S, 4S, 5S, 7S, 8S, 10S, 11S, 13S, 23S)
174.708	91	Urban industrial, 72% imp, HSG C (1S, 2S, 3S, 6S, 9S)
3.810	98	Water Surface, 0% imp, HSG C (3S)
284.018	**94**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
284.018	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 22S, 23S
0.000	HSG D	
0.000	Other	
284.018		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	23.390	0.000	0.000	23.390	Paved parking	2S
0.000	0.000	13.320	0.000	0.000	13.320	Paved roads w/curbs & sewers	12S, 14S, 15S, 16S, 17S, 18S, 19S, 22S
0.000	0.000	68.790	0.000	0.000	68.790	Unconnected pavement	2S, 3S, 4S, 5S, 7S, 8S, 10S, 11S, 13S, 23S
0.000	0.000	174.708	0.000	0.000	174.708	Urban industrial, 72% imp	1S, 2S, 3S, 6S, 9S

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	3.810	0.000	0.000	3.810	Water Surface, 0% imp	3S
0.000	**0.000**	**284.018**	**0.000**	**0.000**	**284.018**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	2R	843.18	805.12	3,805.8	0.0100	0.012	0.0	72.0	0.0	
2	5R	817.00	815.00	100.0	0.0200	0.012	0.0	36.0	0.0	
3	7R	826.00	817.00	650.0	0.0138	0.012	0.0	18.0	0.0	
4	8R	846.00	843.18	300.0	0.0094	0.012	0.0	24.0	0.0	
5	2P	846.46	843.18	100.0	0.0328	0.012	0.0	72.0	0.0	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Process Plant Runoff Area=22.248 ac 72.00% Impervious Runoff Depth>4.96"
Flow Length=350' Slope=0.0050 '/' Tc=5.3 min CN=91 Runoff=190.09 cfs 9.190 af

Subcatchment 2S: West Non-Contact Runoff Area=88.140 ac 82.71% Impervious Runoff Depth>5.25"
Flow Length=2,050' Tc=13.2 min CN=94 Runoff=614.14 cfs 38.540 af

Subcatchment 3S: Northeast Non-Contact Runoff Area=64.180 ac 72.79% Impervious Runoff Depth>5.16"
Flow Length=900' Slope=0.0100 '/' Tc=6.0 min CN=93 Runoff=545.30 cfs 27.573 af

Subcatchment 4S: Crushed Ore Stockpile Runoff Area=2.376 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=21.71 cfs 1.104 af

Subcatchment 5S: Temporary Ore Runoff Area=17.465 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=159.61 cfs 8.112 af

Subcatchment 6S: Southeast Runoff Area=48.143 ac 72.00% Impervious Runoff Depth>4.96"
Flow Length=350' Slope=0.0050 '/' Tc=5.3 min CN=91 Runoff=411.33 cfs 19.886 af

Subcatchment 7S: Explosive Runoff Area=3.564 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=32.57 cfs 1.655 af

Subcatchment 8S: Mining Laydown Area Runoff Area=3.180 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=29.06 cfs 1.477 af

Subcatchment 9S: Effluent Treatment Plant Runoff Area=1.127 ac 72.00% Impervious Runoff Depth>4.96"
Tc=5.0 min CN=91 Runoff=9.74 cfs 0.466 af

Subcatchment 10S: Fuel Station Runoff Area=0.122 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=1.11 cfs 0.057 af

Subcatchment 11S: Contractor Runoff Area=6.453 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=58.97 cfs 2.997 af

Subcatchment 12S: Main Road (West) Runoff Area=3.845 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=35.14 cfs 1.786 af

Subcatchment 13S: Portal Runoff Area=2.370 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=21.66 cfs 1.101 af

Subcatchment 14S: Main Road (East) Runoff Area=5.755 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=52.59 cfs 2.673 af

Subcatchment 15S: Explosive Magazine Runoff Area=0.038 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=0.35 cfs 0.018 af

Subcatchment 16S: WWTP Roadway W Runoff Area=0.610 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=5.57 cfs 0.283 af

Subcatchment 17S: WWTP Roadway S Runoff Area=1.556 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=14.22 cfs 0.722 af

Subcatchment 18S: WWTP Roadway E Runoff Area=0.592 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=5.41 cfs 0.275 af

Subcatchment 19S: North Roadway Runoff Area=0.020 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=0.18 cfs 0.009 af

Subcatchment 22S: Mining Laydown Runoff Area=0.904 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=8.27 cfs 0.420 af

Subcatchment 23S: Slag Stockpile Runoff Area=11.330 ac 100.00% Impervious Runoff Depth>5.57"
Tc=5.0 min CN=98 Runoff=103.54 cfs 5.262 af

Reach 2R: Proposed Contact Water Avg. Flow Depth=4.64' Max Vel=18.45 fps Inflow=451.00 cfs 30.122 af
72.0" Round Pipe n=0.012 L=3,805.8' S=0.0100 '/' Capacity=458.93 cfs Outflow=430.40 cfs 29.997 af

Reach 3R: Overland Flow Avg. Flow Depth=4.27' Max Vel=7.16 fps Inflow=1,080.48 cfs 66.113 af
n=0.035 L=1,500.0' S=0.0067 '/' Capacity=1,369.01 cfs Outflow=996.27 cfs 65.769 af

Reach 5R: Proposed Contact Water Avg. Flow Depth=1.25' Max Vel=13.32 fps Inflow=37.46 cfs 1.942 af
36.0" Round Pipe n=0.012 L=100.0' S=0.0200 '/' Capacity=102.10 cfs Outflow=37.10 cfs 1.941 af

Reach 7R: Proposed Contact Water Pipe Avg. Flow Depth=0.92' Max Vel=8.16 fps Inflow=9.74 cfs 0.466 af
18.0" Round Pipe n=0.012 L=650.0' S=0.0138 '/' Capacity=13.37 cfs Outflow=9.10 cfs 0.465 af

Reach 8R: Proposed Contact Water Avg. Flow Depth=1.48' Max Vel=8.56 fps Inflow=21.71 cfs 1.104 af
24.0" Round Pipe n=0.012 L=300.0' S=0.0094 '/' Capacity=23.82 cfs Outflow=20.72 cfs 1.102 af

Reach 10R: Roadway & Ditches Avg. Flow Depth=0.14' Max Vel=3.18 fps Inflow=0.35 cfs 0.018 af
n=0.013 L=692.3' S=0.0296 '/' Capacity=302.21 cfs Outflow=0.31 cfs 0.018 af

Reach 12R: Roadway & Ditches S Avg. Flow Depth=0.67' Max Vel=5.20 fps Inflow=14.22 cfs 0.722 af
n=0.013 L=1,991.5' S=0.0099 '/' Capacity=174.58 cfs Outflow=11.31 cfs 0.717 af

Reach 17R: Non-Contact Bypass Avg. Flow Depth=0.52' Max Vel=2.96 fps Inflow=33.44 cfs 14.545 af
n=0.035 L=1,100.0' S=0.0127 '/' Capacity=339.69 cfs Outflow=33.42 cfs 14.214 af

Reach 19R: Roadway & Ditches W Avg. Flow Depth=0.43' Max Vel=5.84 fps Inflow=5.57 cfs 0.283 af
n=0.013 L=574.1' S=0.0229 '/' Capacity=265.47 cfs Outflow=5.16 cfs 0.283 af

Reach 20R: Roadway & Ditches E Avg. Flow Depth=0.43' Max Vel=5.65 fps Inflow=5.41 cfs 0.275 af
n=0.013 L=757.9' S=0.0216 '/' Capacity=258.34 cfs Outflow=4.93 cfs 0.274 af

Reach 21R: WWTP Channel Avg. Flow Depth=1.28' Max Vel=13.25 fps Inflow=117.78 cfs 6.537 af
n=0.013 L=442.9' S=0.0185 '/' Capacity=307.20 cfs Outflow=113.34 cfs 6.530 af

Reach 22R: North Roadway & Ditches Avg. Flow Depth=0.11' Max Vel=3.04 fps Inflow=0.18 cfs 0.009 af
n=0.013 L=252.6' S=0.0390 '/' Capacity=346.60 cfs Outflow=0.17 cfs 0.009 af

Reach 23R: Roadway & Ditches Avg. Flow Depth=0.64' Max Vel=3.32 fps Inflow=8.27 cfs 0.420 af
n=0.013 L=1,158.1' S=0.0042 '/' Capacity=114.46 cfs Outflow=6.77 cfs 0.417 af

Reach 26R: West Roadway & Ditches Avg. Flow Depth=0.85' Max Vel=6.08 fps Inflow=35.14 cfs 1.786 af
n=0.013 L=4,921.3' S=0.0098 '/' Capacity=174.12 cfs Outflow=21.57 cfs 1.760 af

Reach 27R: East Roadway & Ditches Avg. Flow Depth=1.06' Max Vel=6.46 fps Inflow=52.59 cfs 2.673 af
n=0.013 L=4,068.2' S=0.0091 '/' Capacity=167.25 cfs Outflow=27.60 cfs 2.644 af

Pond 1P: Existing Bedell/Future Peak Elev=816.20' Storage=40.124 af Inflow=525.57 cfs 40.141 af
Outflow=0.00 cfs 0.000 af

Pond 2P: Proposed SE Contact Sump Peak Elev=862.43' Storage=2.691 af Inflow=601.42 cfs 29.075 af
Primary=432.92 cfs 29.019 af Secondary=0.00 cfs 0.000 af Outflow=432.92 cfs 29.019 af

Pond 3P: Non-Contact Ponds Peak Elev=826.70' Storage=53.968 af Inflow=1,001.69 cfs 66.870 af
Outflow=33.44 cfs 14.545 af

Pond 11P: Sump 3 Inflow=32.78 cfs 1.673 af
Primary=32.78 cfs 1.673 af

Pond 24P: Sump 4 Inflow=0.17 cfs 0.009 af
Primary=0.17 cfs 0.009 af

Pond 26P: Sump 2 Inflow=47.01 cfs 4.887 af
Primary=47.01 cfs 4.887 af

Link 1L: Outfall (To Effluent TP) Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link 3L: Outfall (To Existing Overland Flow) Inflow=33.42 cfs 14.214 af
Primary=33.42 cfs 14.214 af

Link 4L: To Tailings Pond Inflow=239.08 cfs 15.996 af
Primary=239.08 cfs 15.996 af

Total Runoff Area = 284.018 ac Runoff Volume = 123.605 af Average Runoff Depth = 5.22"
18.57% Pervious = 52.728 ac 81.43% Impervious = 231.289 ac

Summary for Subcatchment 1S: Process Plant

[49] Hint: Tc<2dt may require smaller dt

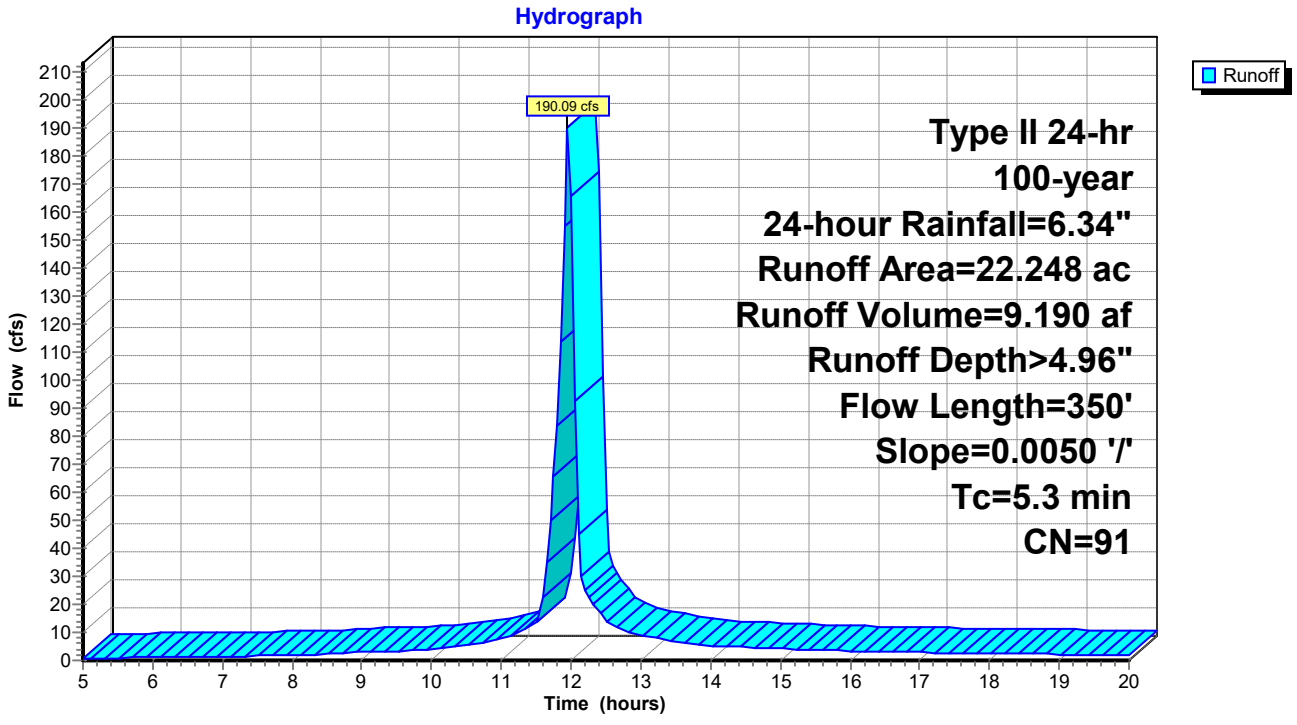
Runoff = 190.09 cfs @ 11.95 hrs, Volume= 9.190 af, Depth> 4.96"
Routed to Pond 2P : Proposed SE Contact Sump

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
22.248	91	Urban industrial, 72% imp, HSG C
6.229		28.00% Pervious Area
16.019		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	100	0.0050	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
2.9	250	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.3	350	Total			

Subcatchment 1S: Process Plant



Summary for Subcatchment 2S: West Non-Contact Watershed

[47] Hint: Peak is 1595% of capacity of segment #3

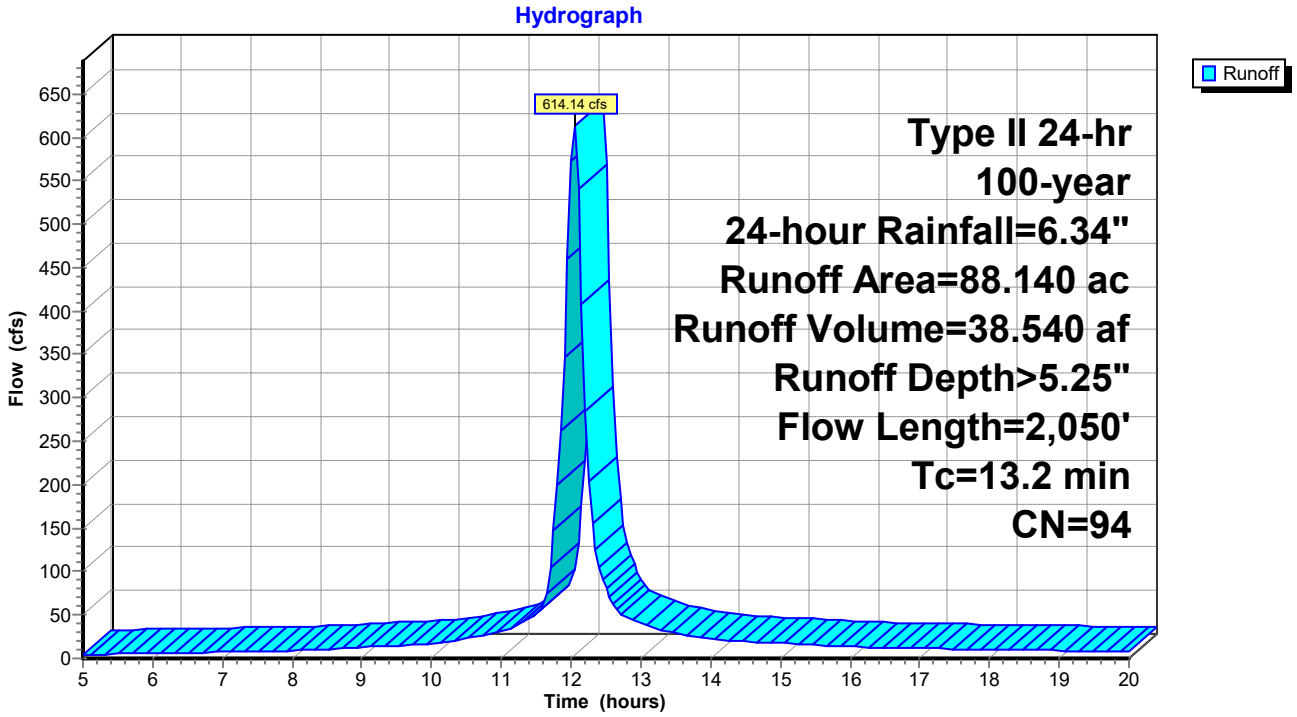
Runoff = 614.14 cfs @ 12.04 hrs, Volume= 38.540 af, Depth> 5.25"
Routed to Reach 3R : Overland Flow

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
54.420	91	Urban industrial, 72% imp, HSG C
10.330	98	Unconnected pavement, HSG C
23.390	98	Paved parking, HSG C
88.140	94	Weighted Average
15.238		17.29% Pervious Area
72.902		82.71% Impervious Area
10.330		14.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	150	0.0100	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.6	150	0.0100	1.61		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.1	1,750	0.0080	3.21	38.50	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=2.00' Z= 3.0 '/' Top.W=12.00' n= 0.040 Earth, cobble bottom, clean sides
13.2	2,050	Total			

Subcatchment 2S: West Non-Contact Watershed



Summary for Subcatchment 3S: Northeast Non-Contact Watershed

[47] Hint: Peak is 1267% of capacity of segment #3

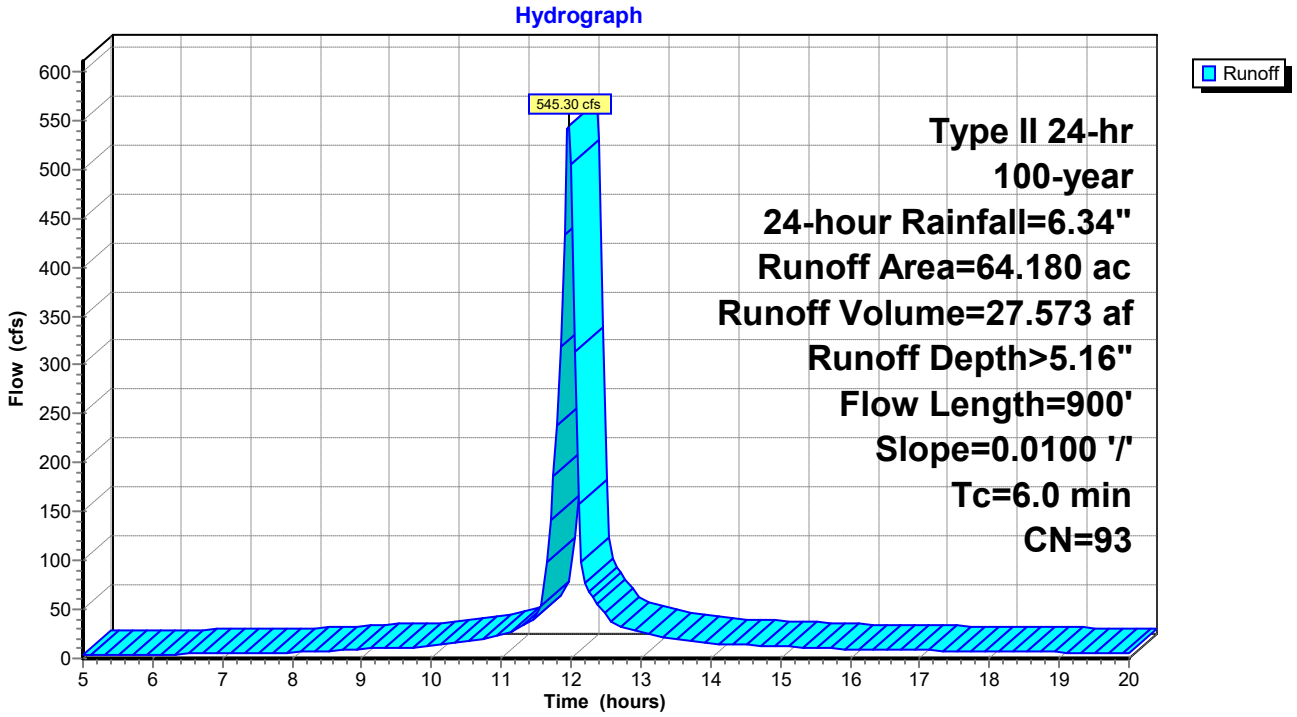
Runoff = 545.30 cfs @ 11.96 hrs, Volume= 27.573 af, Depth> 5.16"
Routed to Reach 3R : Overland Flow

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
48.770	91	Urban industrial, 72% imp, HSG C
11.600	98	Unconnected pavement, HSG C
3.810	98	Water Surface, 0% imp, HSG C
64.180	93	Weighted Average
17.466		27.21% Pervious Area
46.714		72.79% Impervious Area
11.600		24.83% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0100	0.92		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.0	650	0.0100	3.59	43.04	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00' D=2.00' Z= 3.0 '/' Top.W=12.00' n= 0.040 Earth, cobble bottom, clean sides
6.0	900	Total			

Subcatchment 3S: Northeast Non-Contact Watershed



Summary for Subcatchment 4S: Crushed Ore Stockpile

[49] Hint: Tc<2dt may require smaller dt

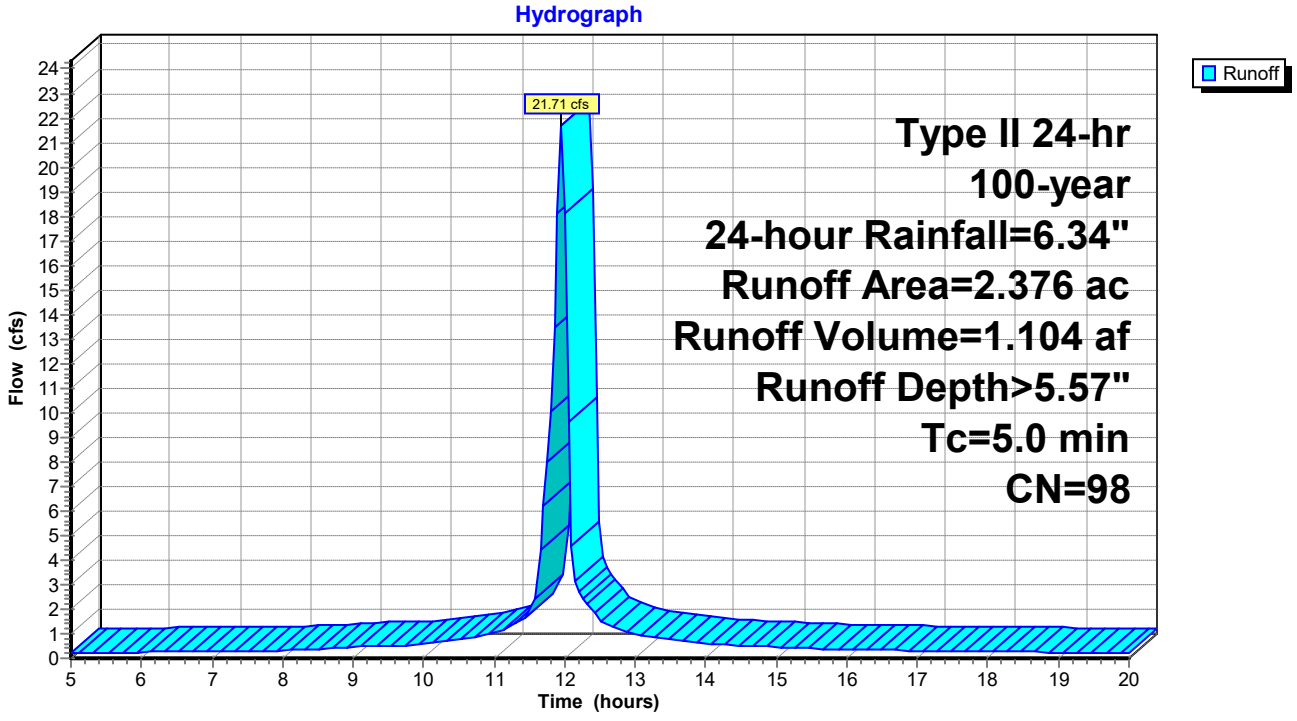
Runoff = 21.71 cfs @ 11.95 hrs, Volume= 1.104 af, Depth> 5.57"
Routed to Reach 8R : Proposed Contact Water Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
2.376	98	Unconnected pavement, HSG C
2.376		100.00% Impervious Area
2.376		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: Crushed Ore Stockpile



Summary for Subcatchment 5S: Temporary Ore Stockpile

[49] Hint: Tc<2dt may require smaller dt

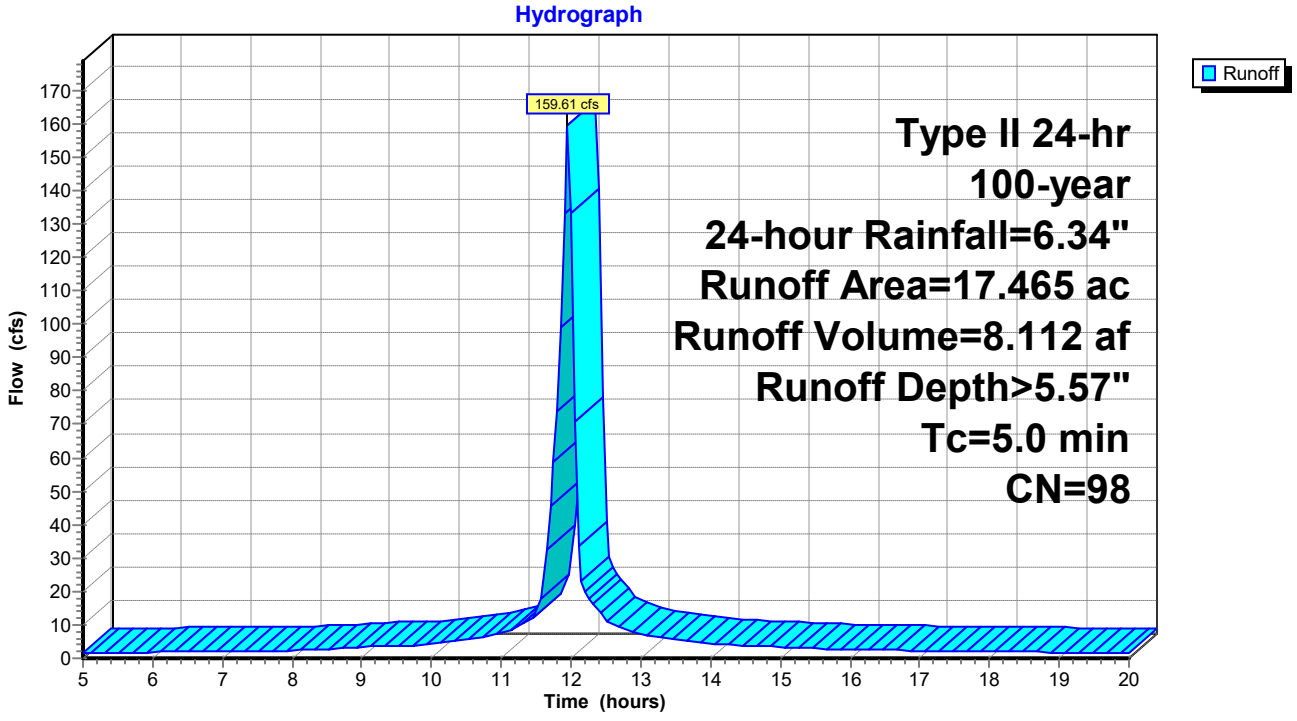
Runoff = 159.61 cfs @ 11.95 hrs, Volume= 8.112 af, Depth> 5.57"
Routed to Link 4L : To Tailings Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
17.465	98	Unconnected pavement, HSG C
17.465		100.00% Impervious Area
17.465		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5S: Temporary Ore Stockpile



Summary for Subcatchment 6S: Southeast Non-Contact Watershed

[49] Hint: Tc<2dt may require smaller dt

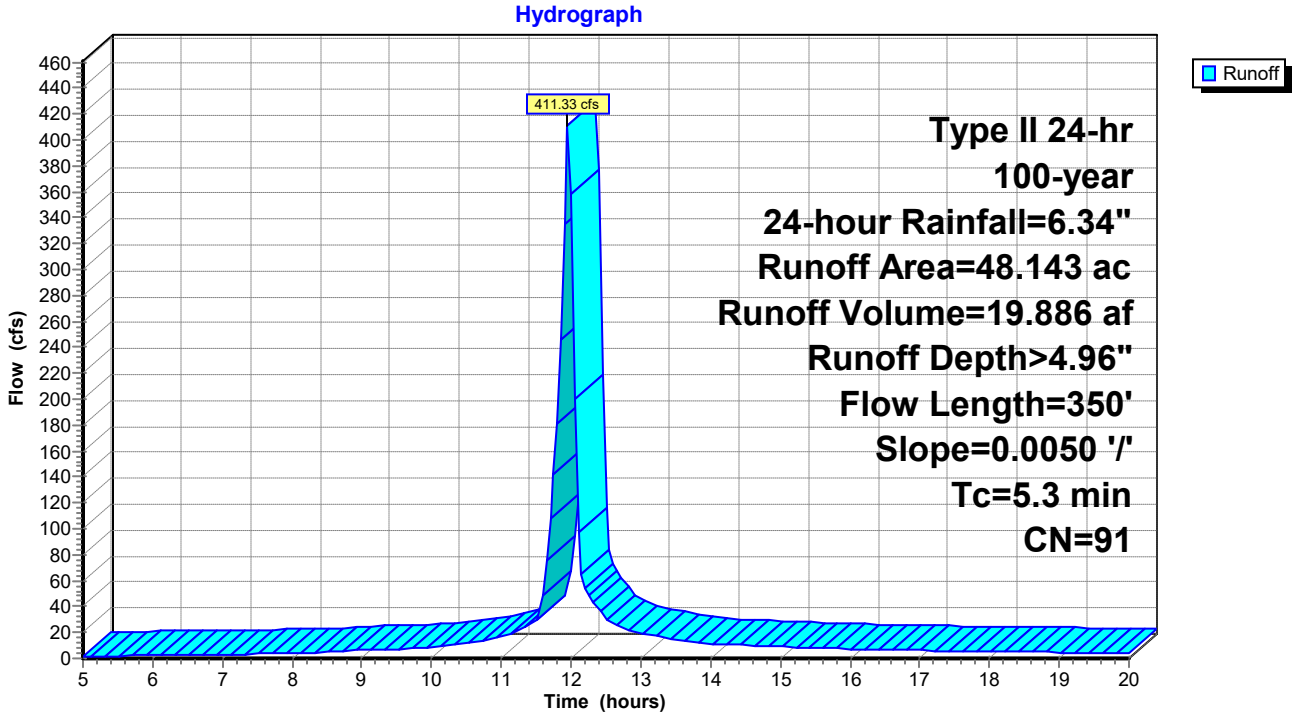
Runoff = 411.33 cfs @ 11.95 hrs, Volume= 19.886 af, Depth> 4.96"
Routed to Pond 2P : Proposed SE Contact Sump

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
48.143	91	Urban industrial, 72% imp, HSG C
13.480		28.00% Pervious Area
34.663		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	100	0.0050	0.70		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.50"
2.9	250	0.0050	1.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.3	350	Total			

Subcatchment 6S: Southeast Non-Contact Watershed



Summary for Subcatchment 7S: Explosive Magazine/Emulsion Silos

[49] Hint: Tc<2dt may require smaller dt

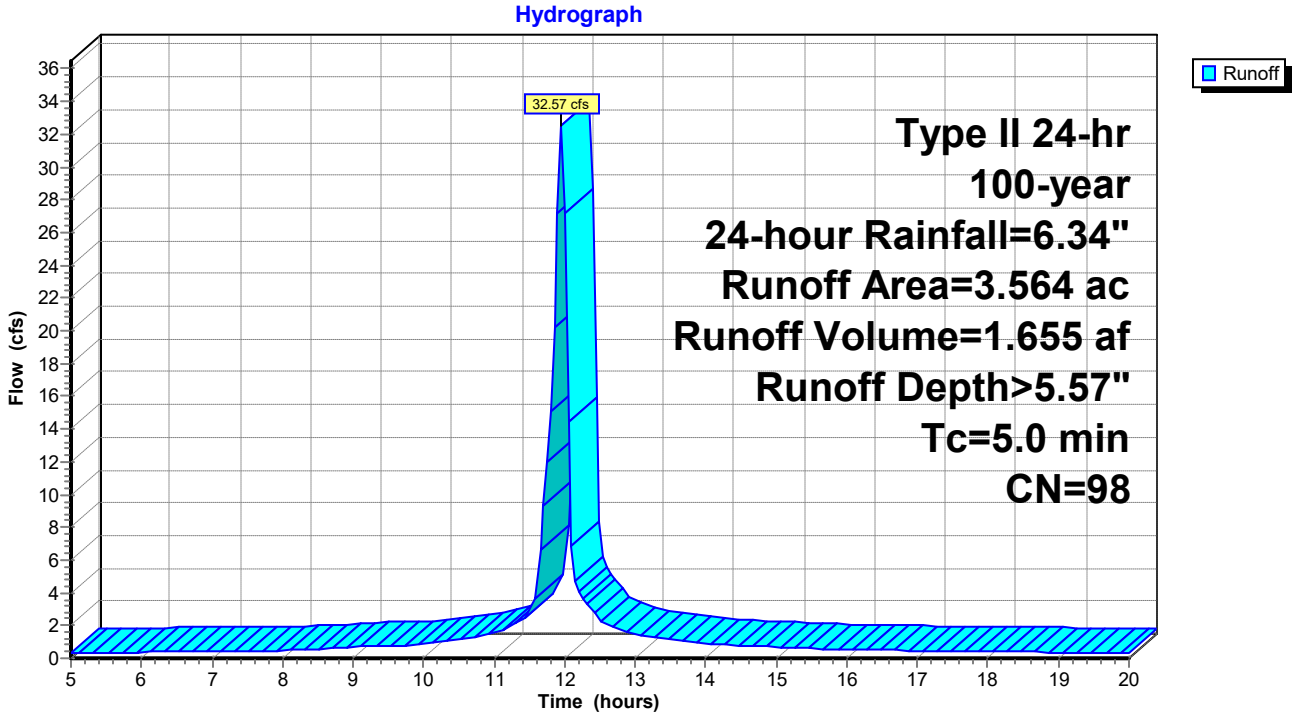
Runoff = 32.57 cfs @ 11.95 hrs, Volume= 1.655 af, Depth> 5.57"
Routed to Pond 11P : Sump 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
3.564	98	Unconnected pavement, HSG C
3.564		100.00% Impervious Area
3.564		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 7S: Explosive Magazine/Emulsion Silos



Summary for Subcatchment 8S: Mining Laydown Area

[49] Hint: Tc<2dt may require smaller dt

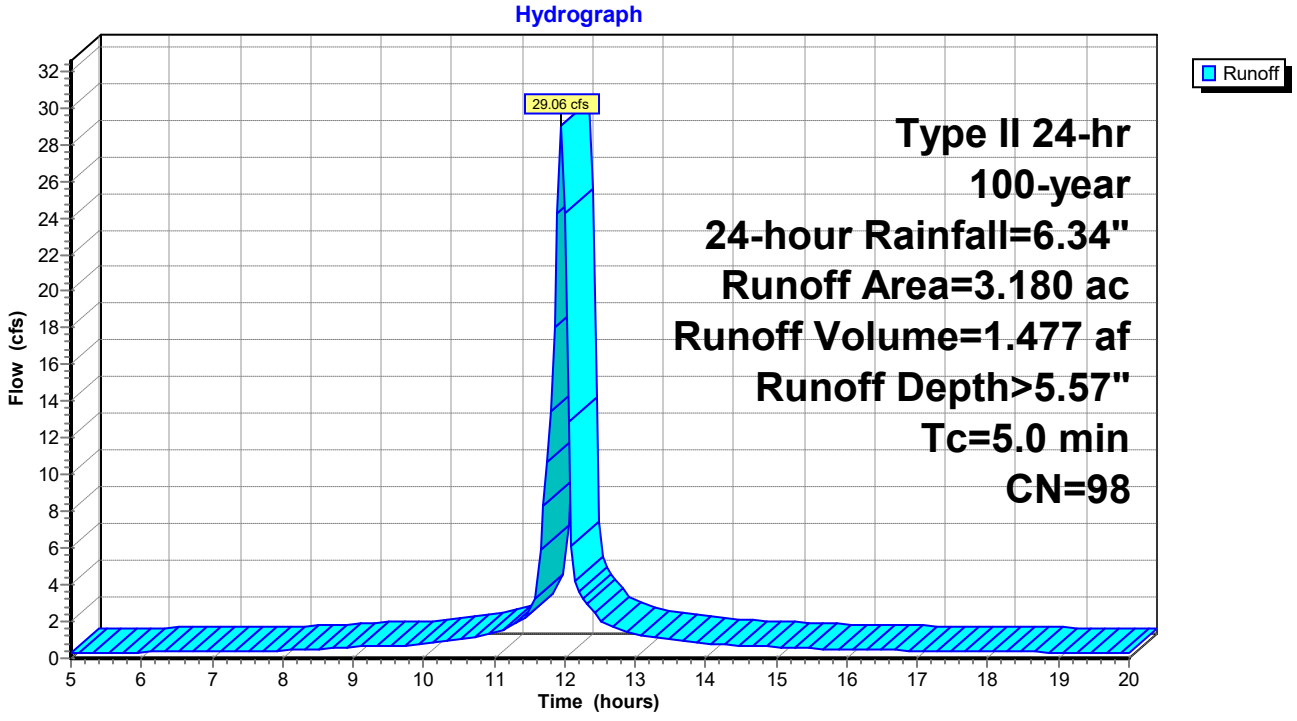
Runoff = 29.06 cfs @ 11.95 hrs, Volume= 1.477 af, Depth> 5.57"
Routed to Reach 5R : Proposed Contact Water Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
3.180	98	Unconnected pavement, HSG C
3.180		100.00% Impervious Area
3.180		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: Mining Laydown Area



Summary for Subcatchment 9S: Effluent Treatment Plant

[49] Hint: Tc<2dt may require smaller dt

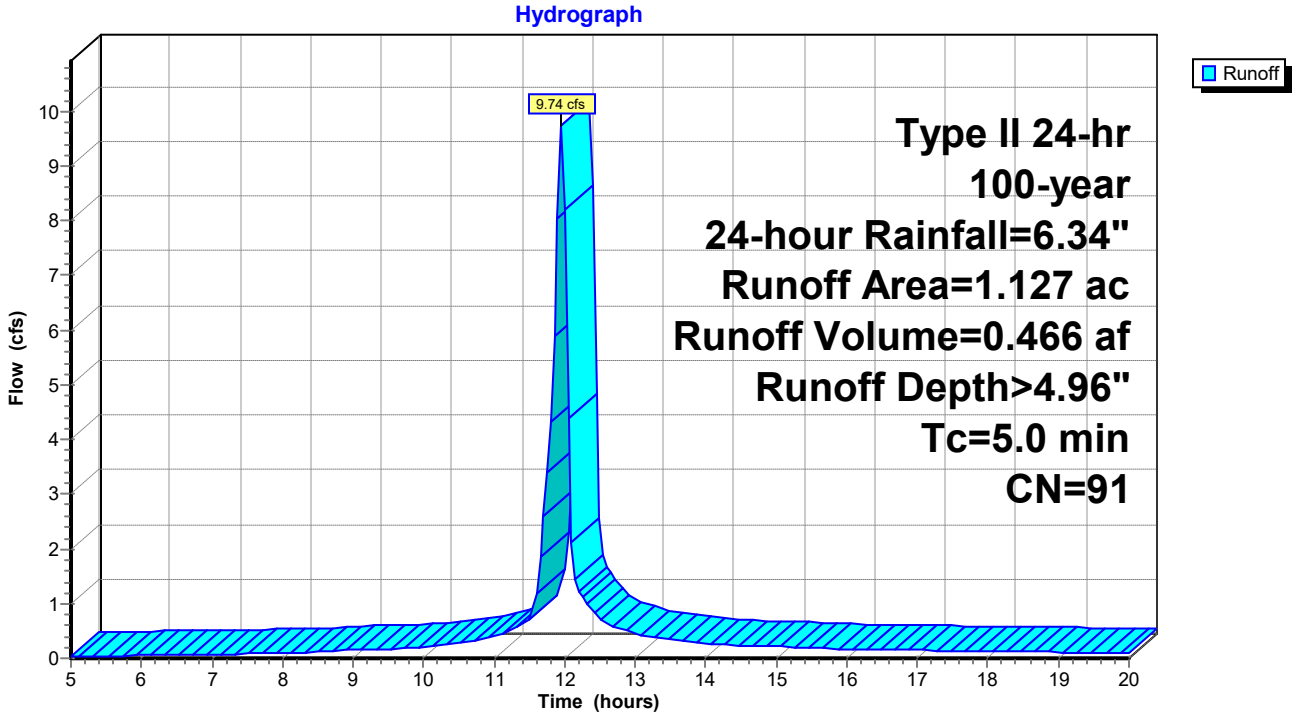
Runoff = 9.74 cfs @ 11.95 hrs, Volume= 0.466 af, Depth> 4.96"
Routed to Reach 7R : Proposed Contact Water Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
1.127	91	Urban industrial, 72% imp, HSG C
0.316		28.00% Pervious Area
0.811		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Effluent Treatment Plant



Summary for Subcatchment 10S: Fuel Station

[49] Hint: Tc<2dt may require smaller dt

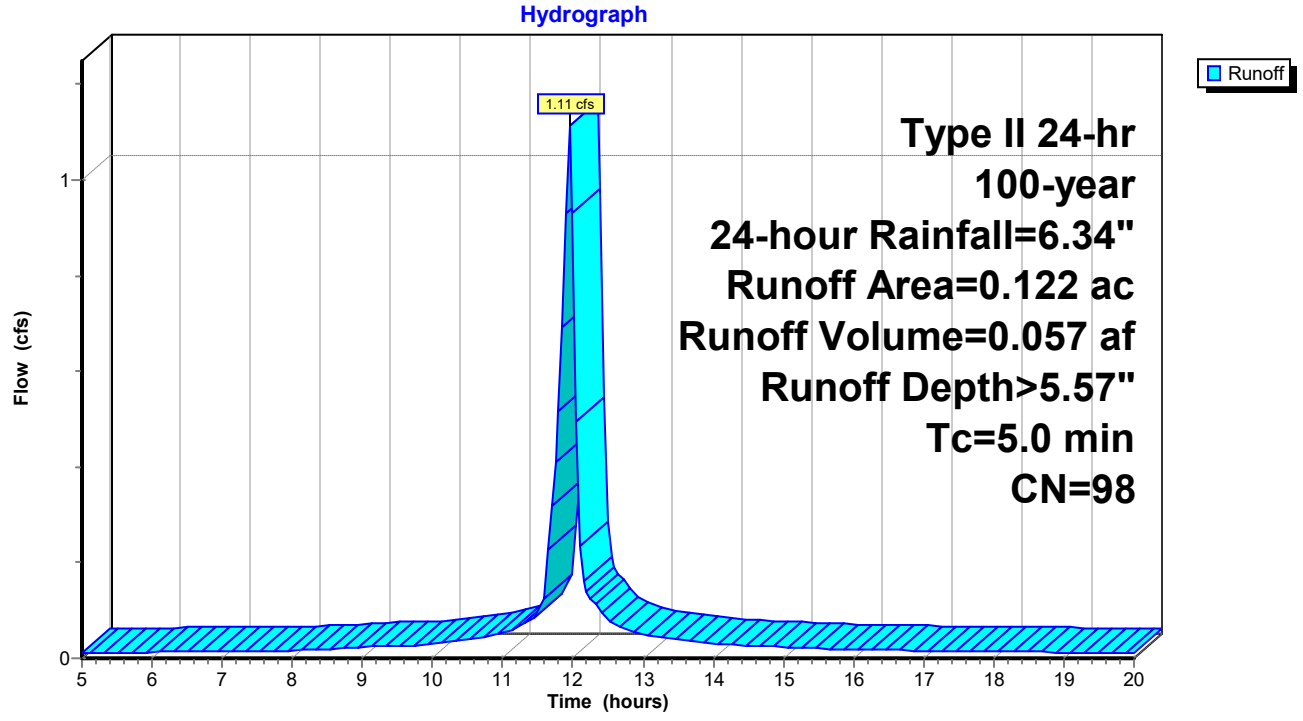
Runoff = 1.11 cfs @ 11.95 hrs, Volume= 0.057 af, Depth> 5.57"
Routed to Pond 26P : Sump 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
0.122	98	Unconnected pavement, HSG C
0.122		100.00% Impervious Area
0.122		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 10S: Fuel Station



Summary for Subcatchment 11S: Contractor Facilities/Shotcrete Plant

[49] Hint: Tc<2dt may require smaller dt

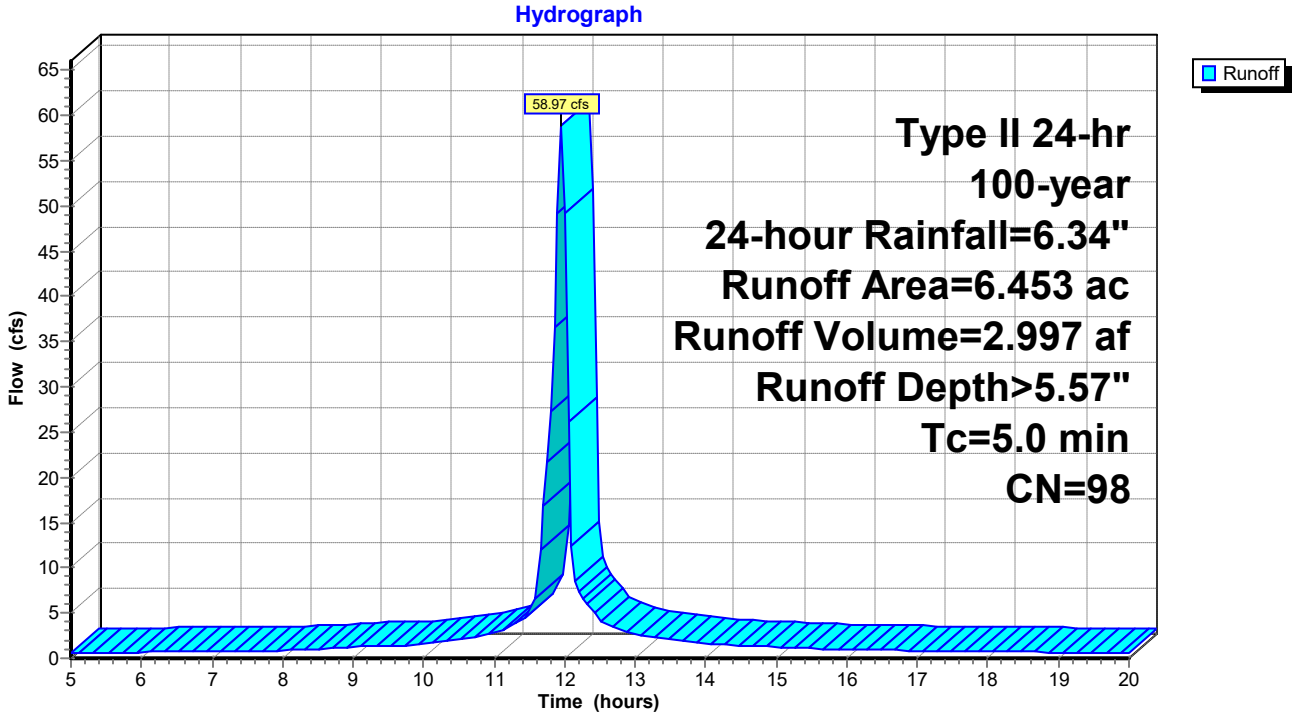
Runoff = 58.97 cfs @ 11.95 hrs, Volume= 2.997 af, Depth> 5.57"
Routed to Link 4L : To Tailings Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
6.453	98	Unconnected pavement, HSG C
6.453		100.00% Impervious Area
6.453		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: Contractor Facilities/Shotcrete Plant



Summary for Subcatchment 12S: Main Road (West)

[49] Hint: Tc<2dt may require smaller dt

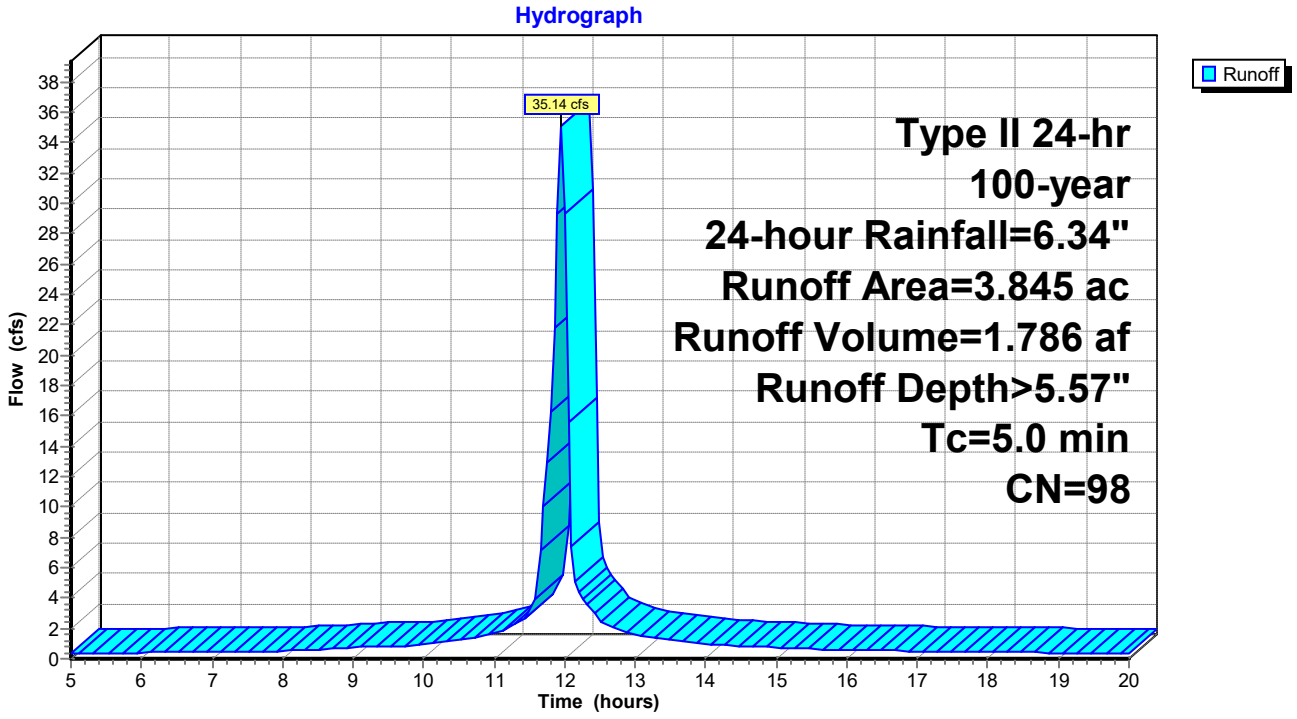
Runoff = 35.14 cfs @ 11.95 hrs, Volume= 1.786 af, Depth> 5.57"
Routed to Reach 26R : West Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
3.845	98	Paved roads w/curbs & sewers, HSG C
3.845		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: Main Road (West)



Summary for Subcatchment 13S: Portal

[49] Hint: Tc<2dt may require smaller dt

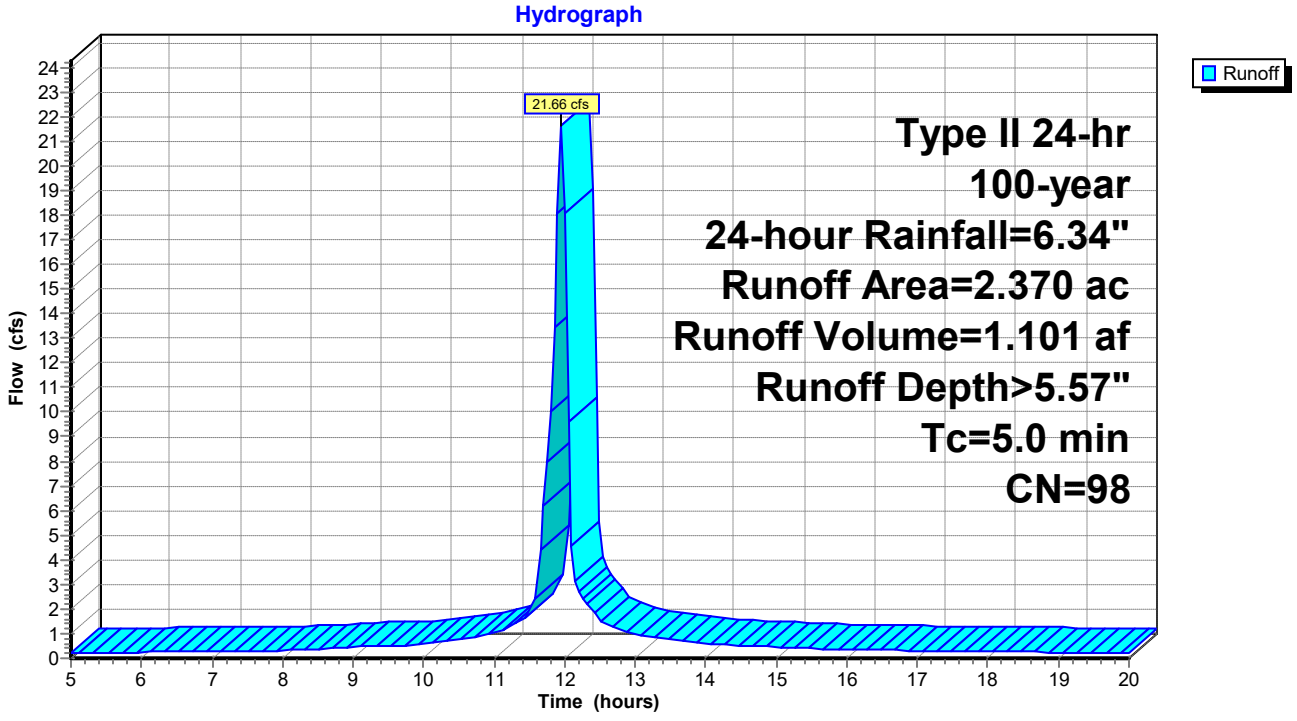
Runoff = 21.66 cfs @ 11.95 hrs, Volume= 1.101 af, Depth> 5.57"
Routed to Pond 3P : Non-Contact Ponds

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
2.370	98	Unconnected pavement, HSG C
2.370		100.00% Impervious Area
2.370		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 13S: Portal



Summary for Subcatchment 14S: Main Road (East)

[49] Hint: Tc<2dt may require smaller dt

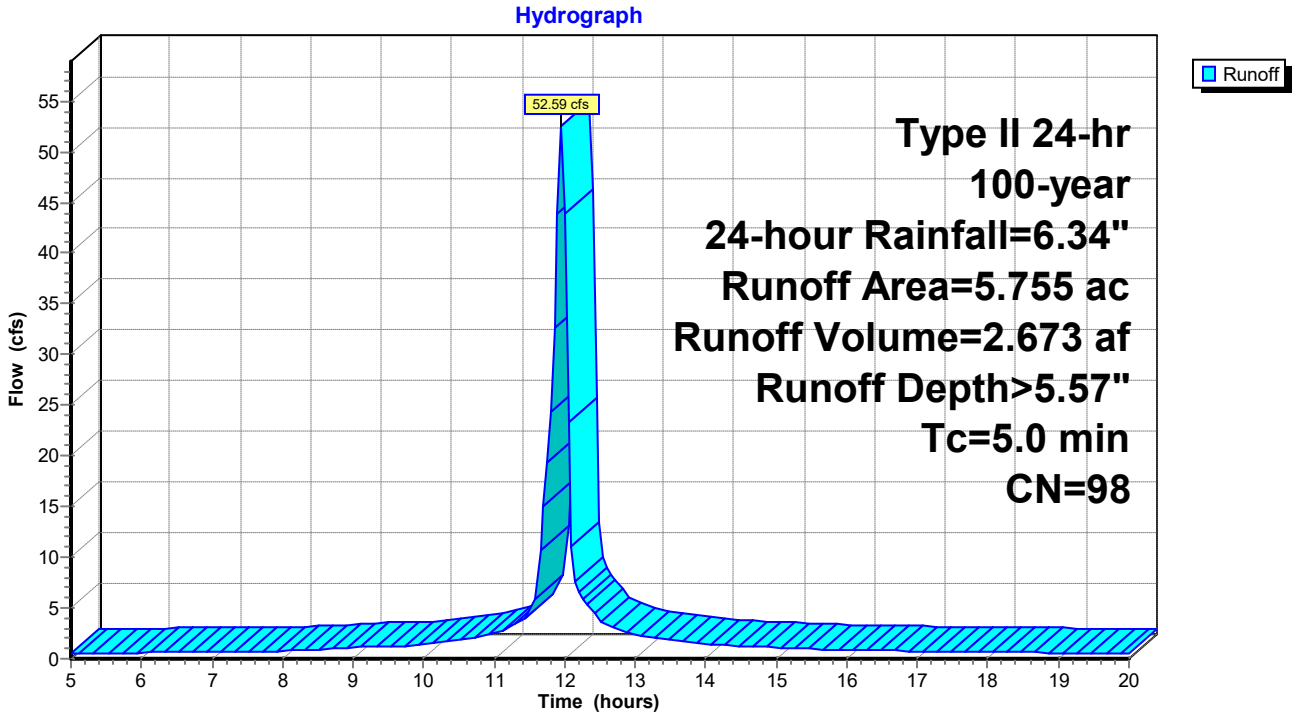
Runoff = 52.59 cfs @ 11.95 hrs, Volume= 2.673 af, Depth> 5.57"
Routed to Reach 27R : East Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
5.755	98	Paved roads w/curbs & sewers, HSG C
5.755		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 14S: Main Road (East)



Summary for Subcatchment 15S: Explosive Magazine Roadway

[49] Hint: Tc<2dt may require smaller dt

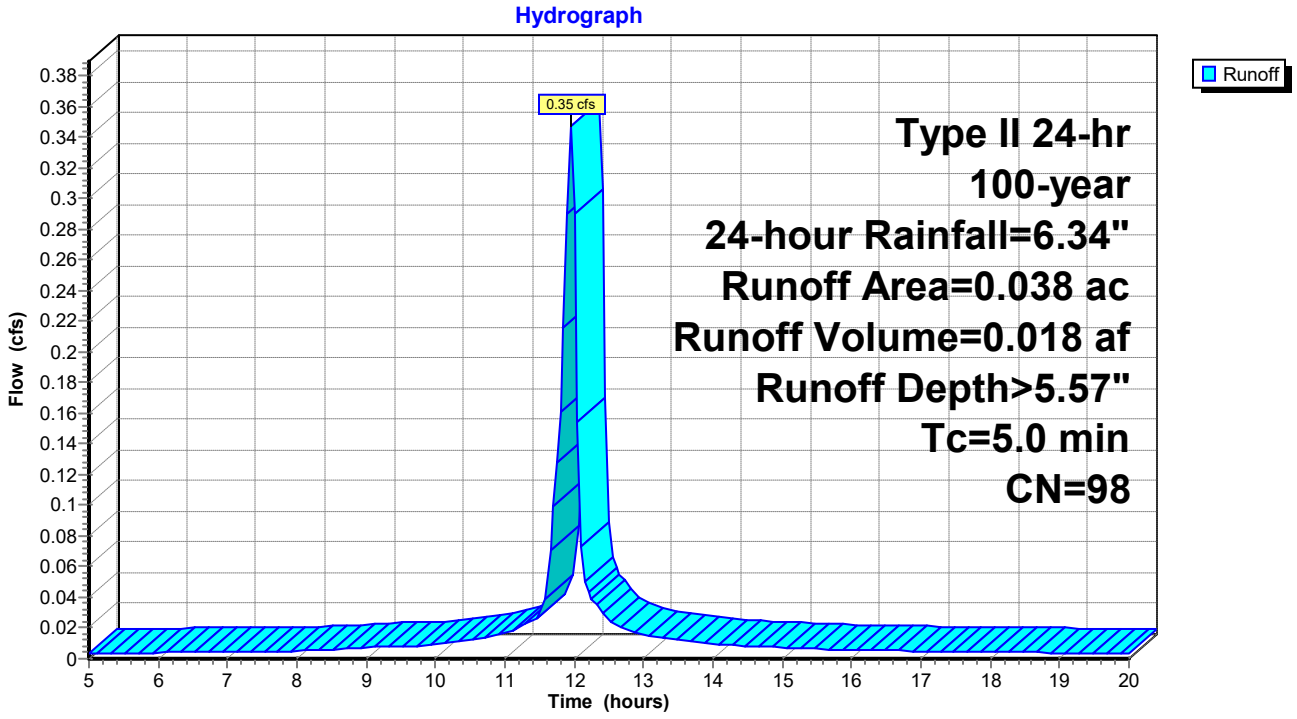
Runoff = 0.35 cfs @ 11.95 hrs, Volume= 0.018 af, Depth> 5.57"
Routed to Reach 10R : Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
0.038	98	Paved roads w/curbs & sewers, HSG C
0.038		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 15S: Explosive Magazine Roadway



Summary for Subcatchment 16S: WWTP Roadway W

[49] Hint: Tc<2dt may require smaller dt

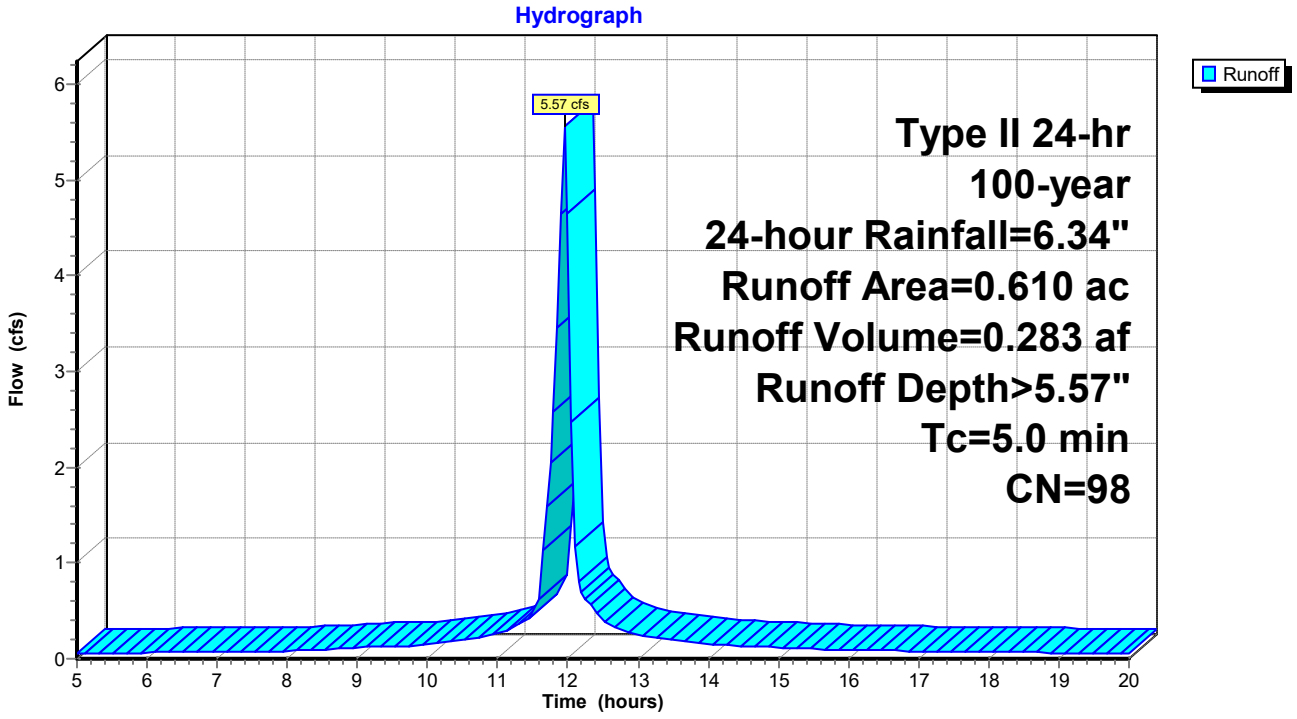
Runoff = 5.57 cfs @ 11.95 hrs, Volume= 0.283 af, Depth> 5.57"
Routed to Reach 19R : Roadway & Ditches W

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
0.610	98	Paved roads w/curbs & sewers, HSG C
0.610		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 16S: WWTP Roadway W



Summary for Subcatchment 17S: WWTP Roadway S

[49] Hint: Tc<2dt may require smaller dt

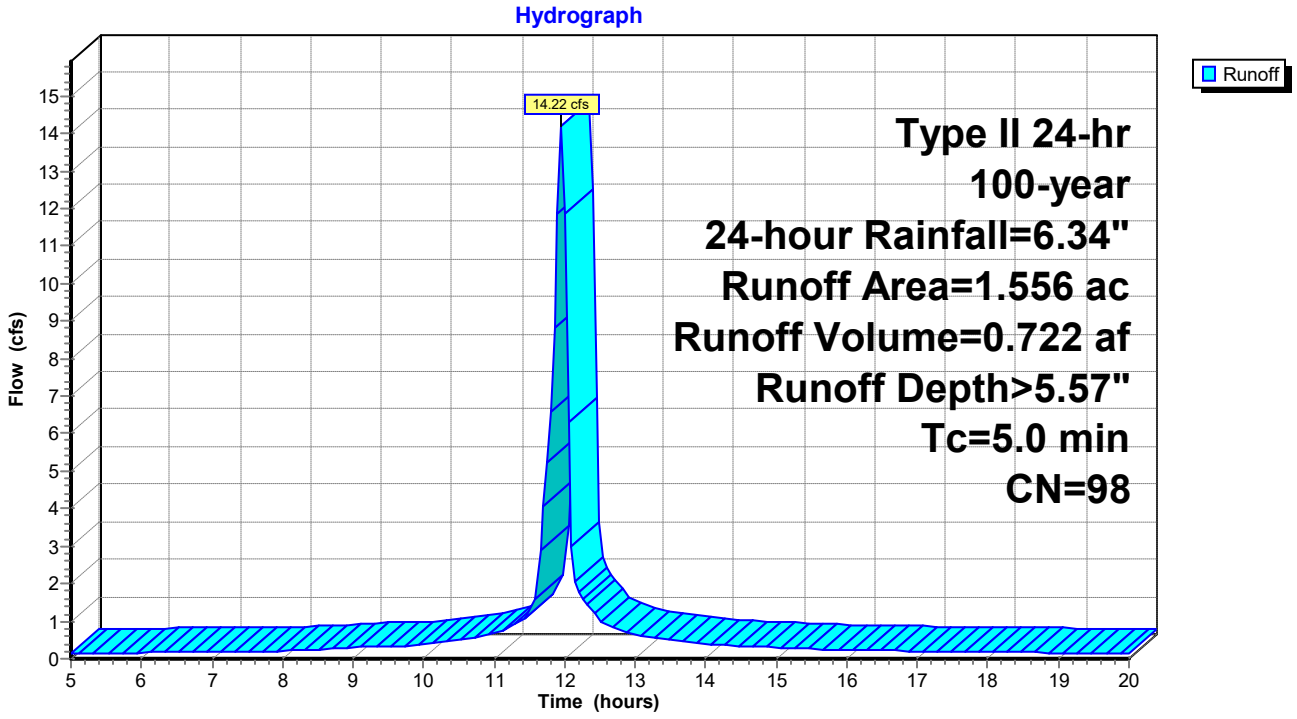
Runoff = 14.22 cfs @ 11.95 hrs, Volume= 0.722 af, Depth> 5.57"
Routed to Reach 12R : Roadway & Ditches S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
1.556	98	Paved roads w/curbs & sewers, HSG C
1.556		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 17S: WWTP Roadway S



Summary for Subcatchment 18S: WWTP Roadway E

[49] Hint: Tc<2dt may require smaller dt

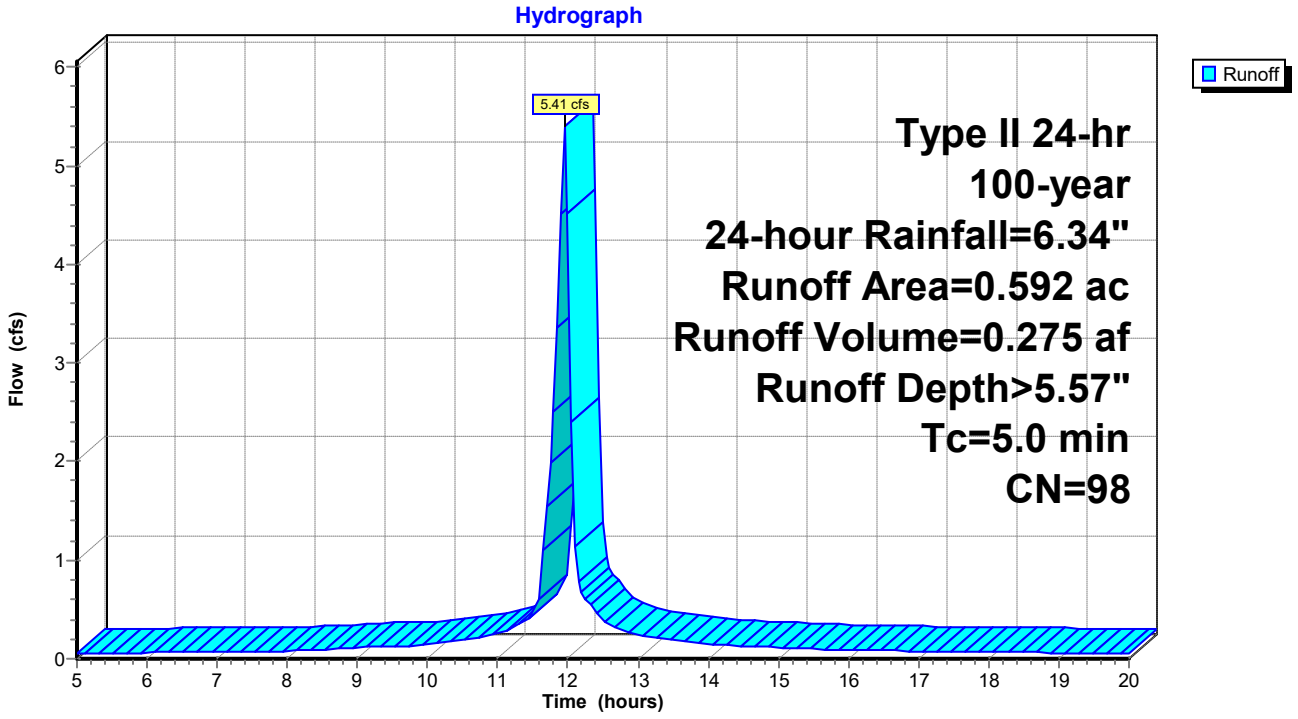
Runoff = 5.41 cfs @ 11.95 hrs, Volume= 0.275 af, Depth> 5.57"
Routed to Reach 20R : Roadway & Ditches E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
0.592	98	Paved roads w/curbs & sewers, HSG C
0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 18S: WWTP Roadway E



Summary for Subcatchment 19S: North Roadway

[49] Hint: Tc<2dt may require smaller dt

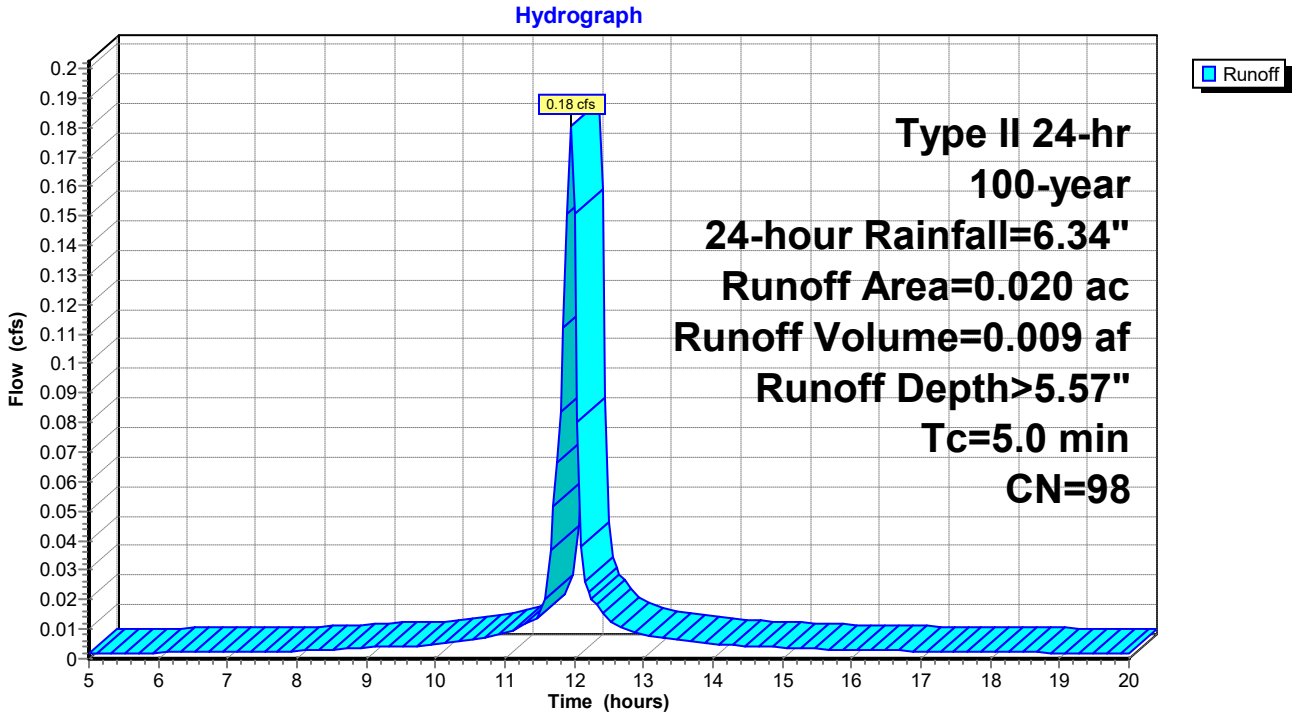
Runoff = 0.18 cfs @ 11.95 hrs, Volume= 0.009 af, Depth> 5.57"
Routed to Reach 22R : North Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
0.020	98	Paved roads w/curbs & sewers, HSG C
0.020		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 19S: North Roadway



Summary for Subcatchment 22S: Mining Laydown Roadway

[49] Hint: Tc<2dt may require smaller dt

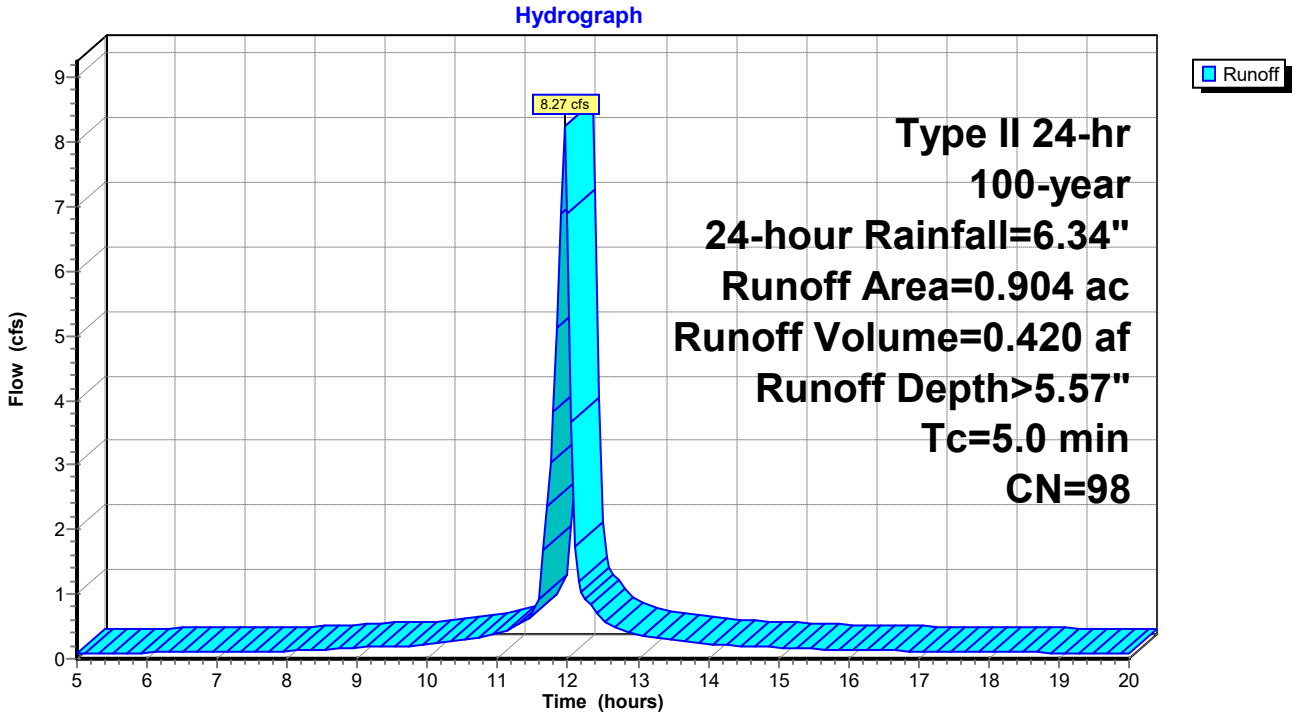
Runoff = 8.27 cfs @ 11.95 hrs, Volume= 0.420 af, Depth> 5.57"
Routed to Reach 23R : Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
0.904	98	Paved roads w/curbs & sewers, HSG C
0.904		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 22S: Mining Laydown Roadway



Summary for Subcatchment 23S: Slag Stockpile

[49] Hint: Tc<2dt may require smaller dt

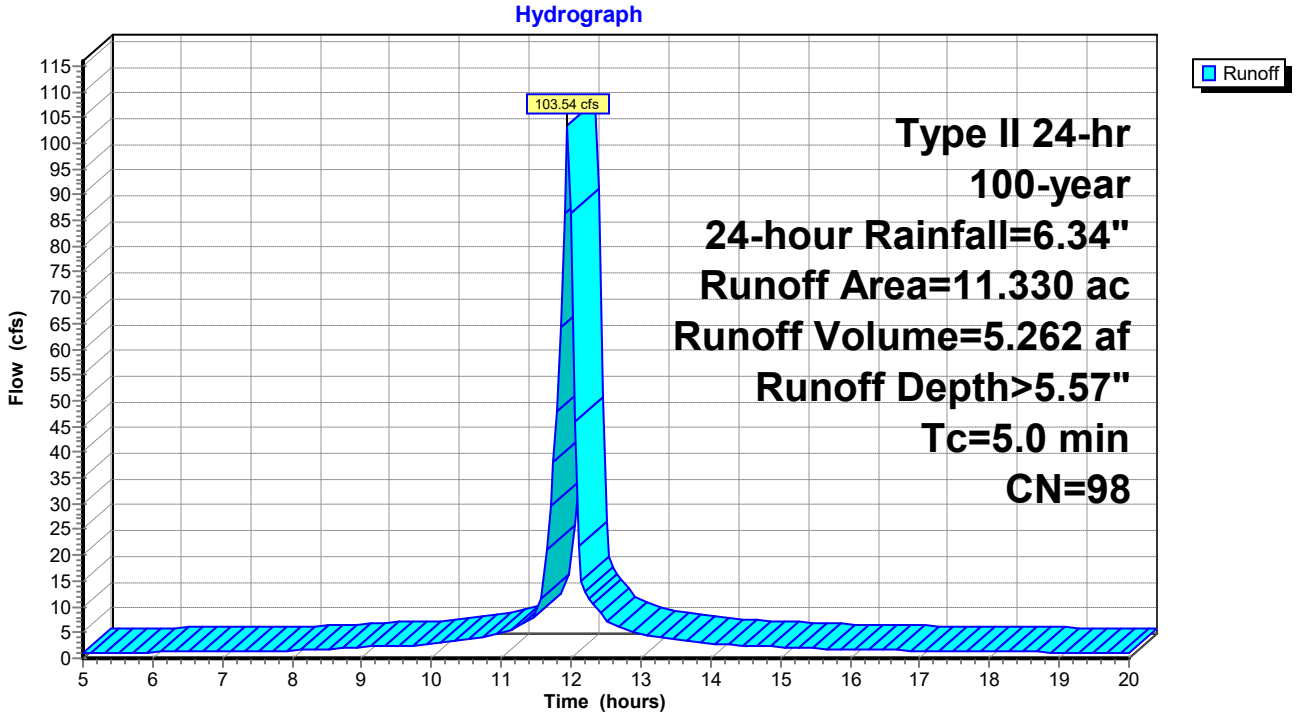
Runoff = 103.54 cfs @ 11.95 hrs, Volume= 5.262 af, Depth> 5.57"
Routed to Reach 21R : WWTP Channel

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=6.34"

Area (ac)	CN	Description
11.330	98	Unconnected pavement, HSG C
11.330		100.00% Impervious Area
11.330		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 23S: Slag Stockpile



Summary for Reach 2R: Proposed Contact Water Pipe

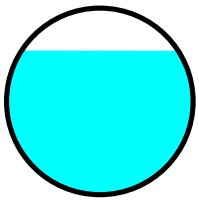
[52] Hint: Inlet/Outlet conditions not evaluated
[63] Warning: Exceeded Reach 8R INLET depth by 1.05' @ 12.10 hrs
[79] Warning: Submerged Pond 2P Primary device # 1 INLET by 1.35'

Inflow Area = 72.767 ac, 72.91% Impervious, Inflow Depth > 4.97" for 100-year, 24-hour event
Inflow = 451.00 cfs @ 12.01 hrs, Volume= 30.122 af
Outflow = 430.40 cfs @ 12.11 hrs, Volume= 29.997 af, Atten= 5%, Lag= 6.1 min
Routed to Pond 1P : Existing Bedell/Future Contact Pond

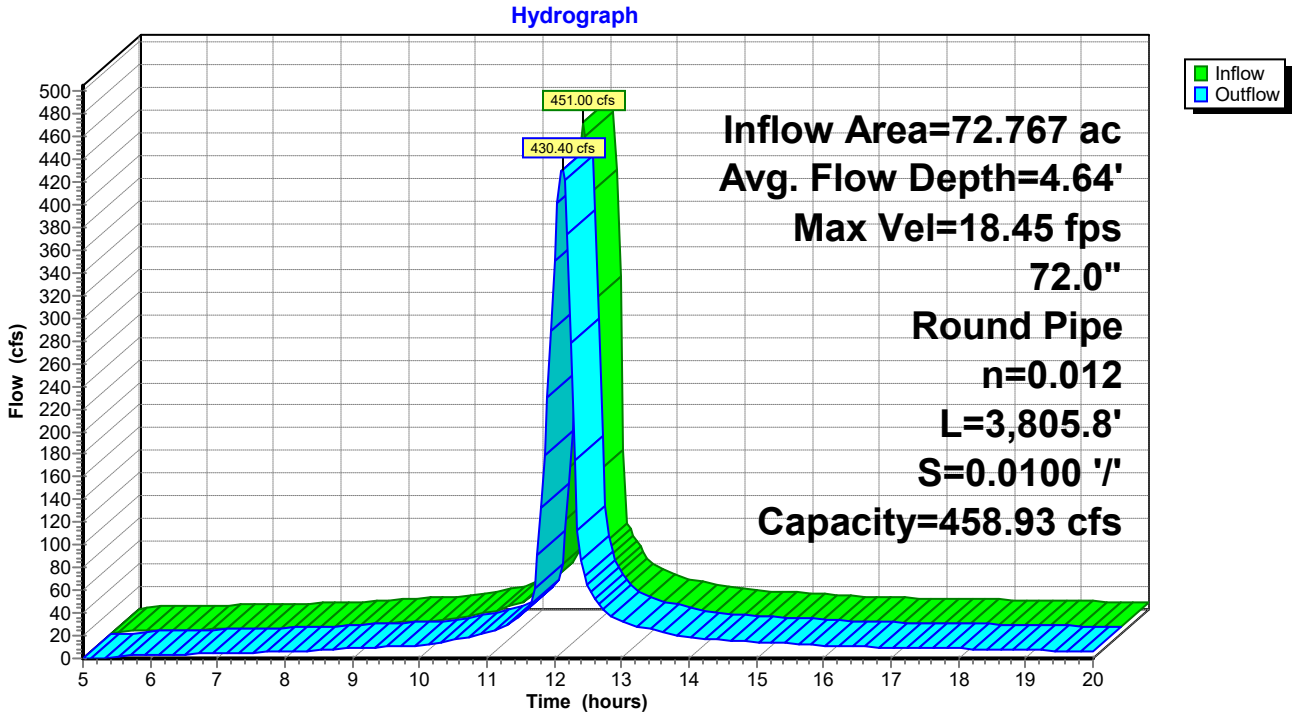
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 18.45 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 7.13 fps, Avg. Travel Time= 8.9 min

Peak Storage= 89,226 cf @ 12.06 hrs
Average Depth at Peak Storage= 4.64' , Surface Width= 5.03'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 458.93 cfs

72.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 3,805.8' Slope= 0.0100 '/'
Inlet Invert= 843.18', Outlet Invert= 805.12'



Reach 2R: Proposed Contact Water Pipe



Summary for Reach 3R: Overland Flow

[82] Warning: Early inflow requires earlier time span

Inflow Area = 152.320 ac, 78.53% Impervious, Inflow Depth > 5.21" for 100-year, 24-hour event
Inflow = 1,080.48 cfs @ 11.99 hrs, Volume= 66.113 af
Outflow = 996.27 cfs @ 12.09 hrs, Volume= 65.769 af, Atten= 8%, Lag= 5.8 min
Routed to Pond 3P : Non-Contact Ponds

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.16 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 10.8 min

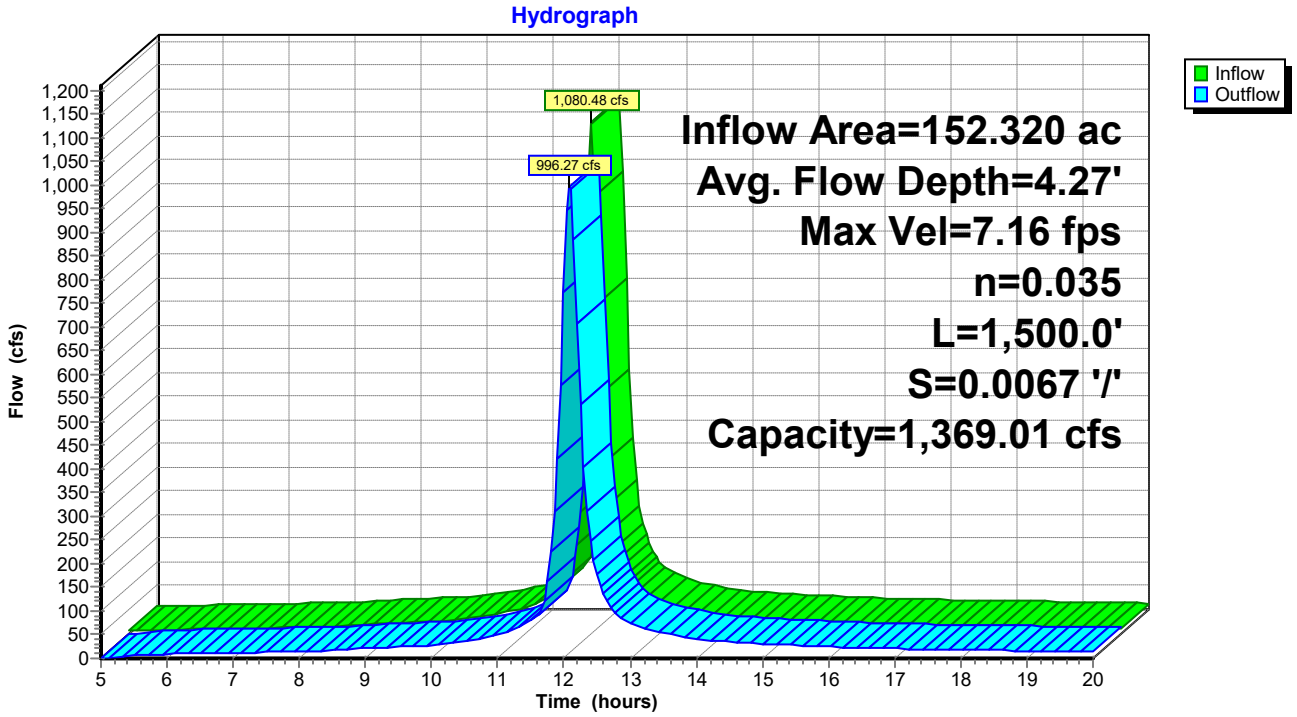
Peak Storage= 210,338 cf @ 12.03 hrs
Average Depth at Peak Storage= 4.27' , Surface Width= 45.64'
Bank-Full Depth= 5.00' Flow Area= 175.0 sf, Capacity= 1,369.01 cfs

20.00' x 5.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 50.00'
Length= 1,500.0' Slope= 0.0067 '/'
Inlet Invert= 842.00', Outlet Invert= 832.00'



‡

Reach 3R: Overland Flow



Summary for Reach 5R: Proposed Contact Water Pipe

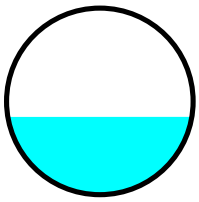
[52] Hint: Inlet/Outlet conditions not evaluated
[82] Warning: Early inflow requires earlier time span
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.34' @ 11.95 hrs

Inflow Area = 4.307 ac, 92.67% Impervious, Inflow Depth > 5.41" for 100-year, 24-hour event
Inflow = 37.46 cfs @ 11.96 hrs, Volume= 1.942 af
Outflow = 37.10 cfs @ 11.96 hrs, Volume= 1.941 af, Atten= 1%, Lag= 0.2 min
Routed to Pond 1P : Existing Bedell/Future Contact Pond

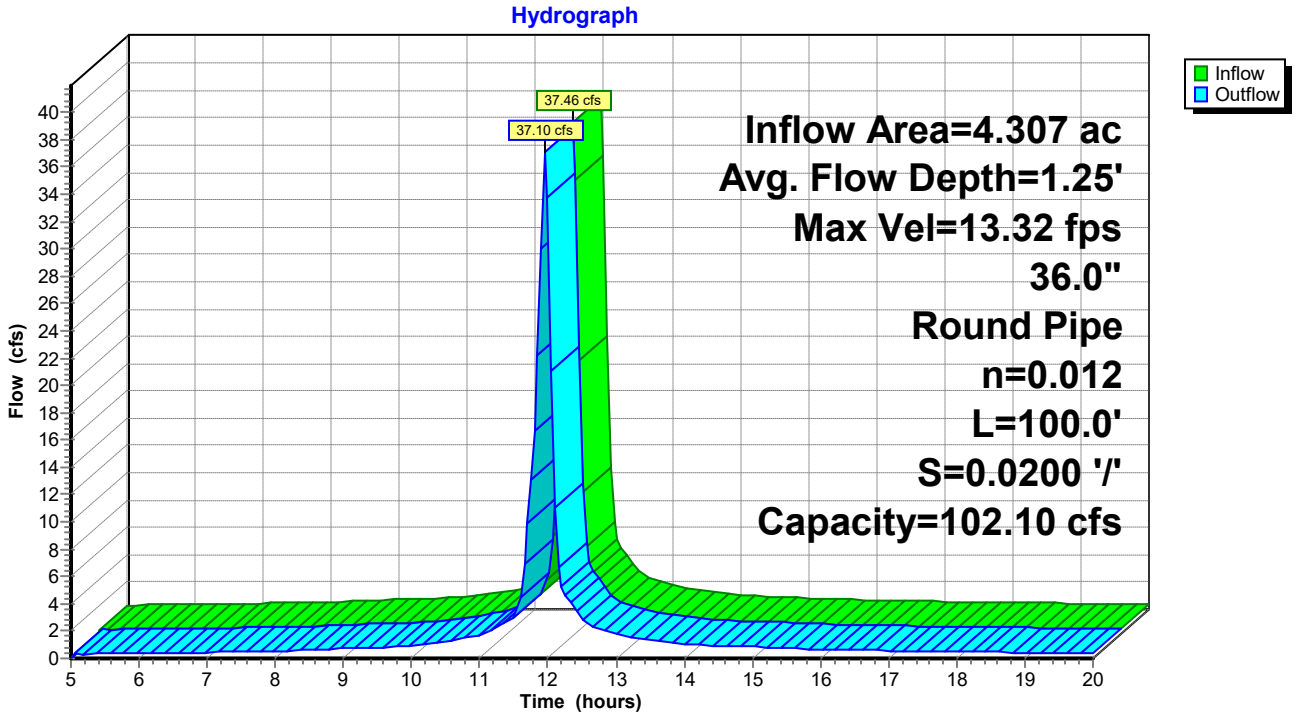
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 13.32 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.51 fps, Avg. Travel Time= 0.4 min

Peak Storage= 280 cf @ 11.96 hrs
Average Depth at Peak Storage= 1.25' , Surface Width= 2.96'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 102.10 cfs

36.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 100.0' Slope= 0.0200 '/'
Inlet Invert= 817.00', Outlet Invert= 815.00'



Reach 5R: Proposed Contact Water Pipe



Summary for Reach 7R: Proposed Contact Water Pipe

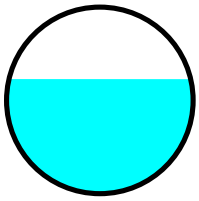
[52] Hint: Inlet/Outlet conditions not evaluated
[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.127 ac, 72.00% Impervious, Inflow Depth > 4.96" for 100-year, 24-hour event
Inflow = 9.74 cfs @ 11.95 hrs, Volume= 0.466 af
Outflow = 9.10 cfs @ 11.99 hrs, Volume= 0.465 af, Atten= 7%, Lag= 2.3 min
Routed to Reach 5R : Proposed Contact Water Pipe

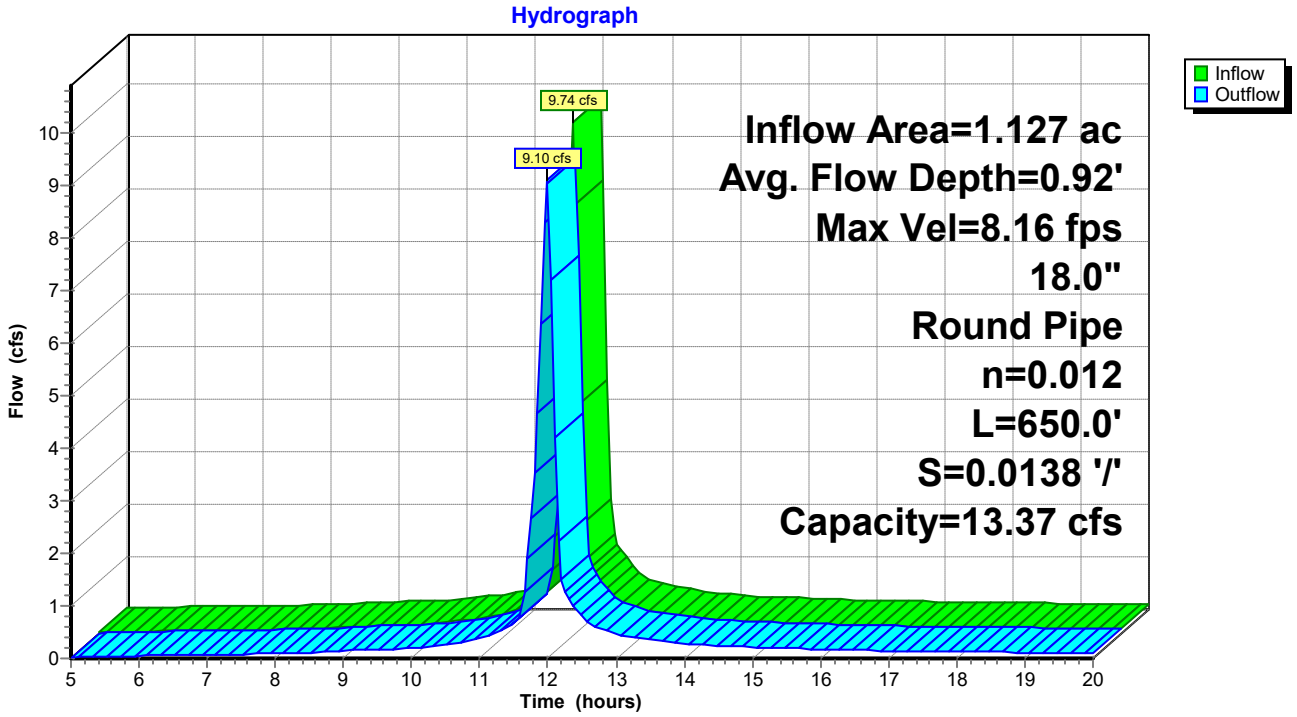
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.16 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.77 fps, Avg. Travel Time= 3.9 min

Peak Storage= 741 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.92' , Surface Width= 1.46'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 13.37 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 650.0' Slope= 0.0138 '/'
Inlet Invert= 826.00', Outlet Invert= 817.00'



Reach 7R: Proposed Contact Water Pipe



Summary for Reach 8R: Proposed Contact Water Pipe

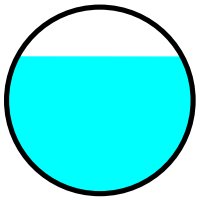
[52] Hint: Inlet/Outlet conditions not evaluated
[82] Warning: Early inflow requires earlier time span

Inflow Area = 2.376 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 21.71 cfs @ 11.95 hrs, Volume= 1.104 af
Outflow = 20.72 cfs @ 11.97 hrs, Volume= 1.102 af, Atten= 5%, Lag= 1.0 min
Routed to Reach 2R : Proposed Contact Water Pipe

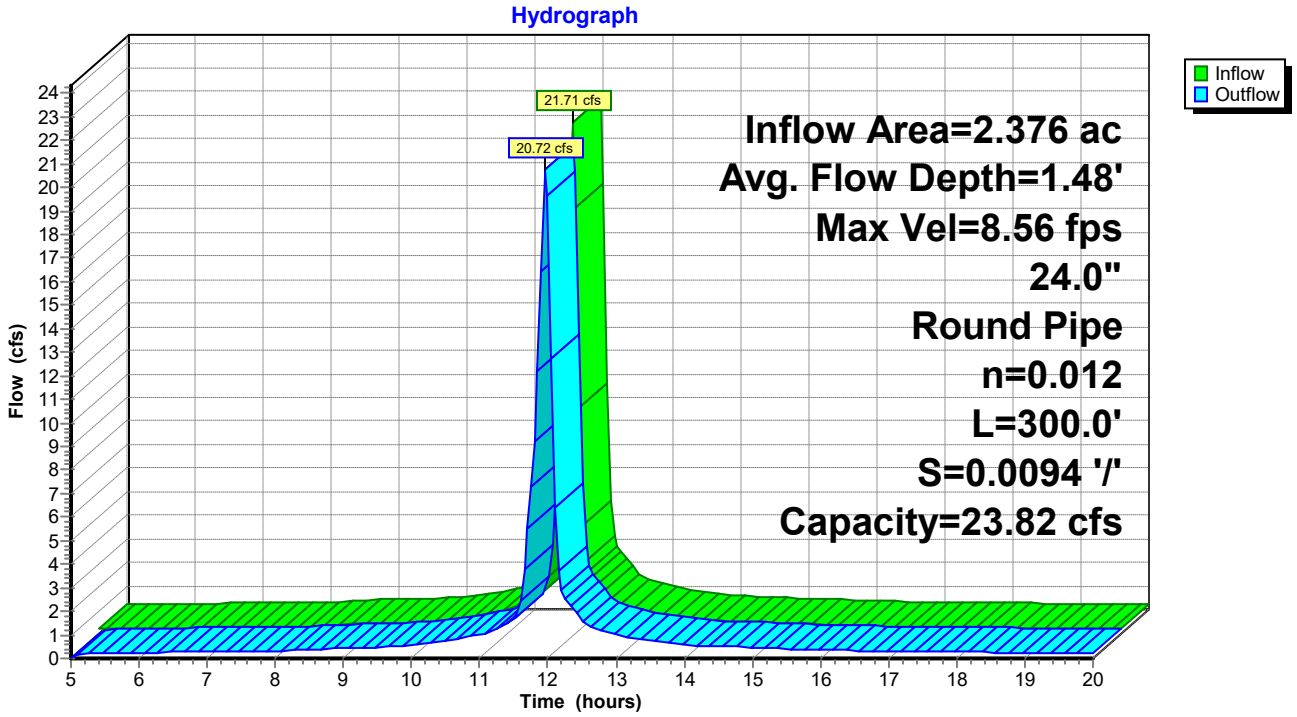
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.56 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.09 fps, Avg. Travel Time= 1.6 min

Peak Storage= 746 cf @ 11.96 hrs
Average Depth at Peak Storage= 1.48' , Surface Width= 1.76'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 23.82 cfs

24.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 300.0' Slope= 0.0094 '/'
Inlet Invert= 846.00', Outlet Invert= 843.18'



Reach 8R: Proposed Contact Water Pipe



Summary for Reach 10R: Roadway & Ditches

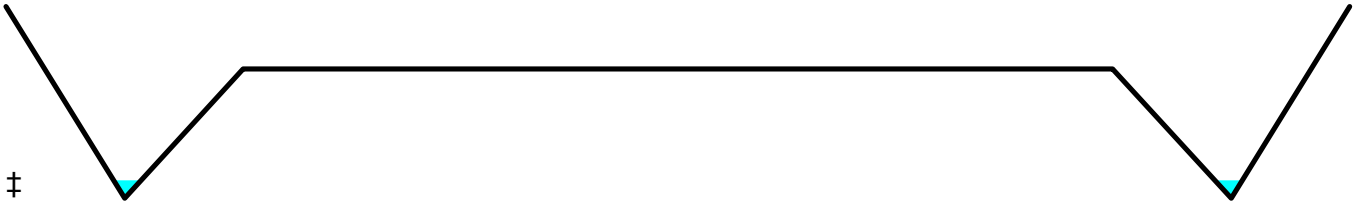
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.038 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 0.35 cfs @ 11.95 hrs, Volume= 0.018 af
Outflow = 0.31 cfs @ 12.05 hrs, Volume= 0.018 af, Atten= 12%, Lag= 5.7 min
Routed to Pond 11P : Sump 3

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.18 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 8.8 min

Peak Storage= 68 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 1.39'
Bank-Full Depth= 1.51' Flow Area= 21.4 sf, Capacity= 302.21 cfs

Custom cross-section, Length= 692.3' Slope= 0.0296 '/' (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 829.23', Outlet Invert= 808.73'

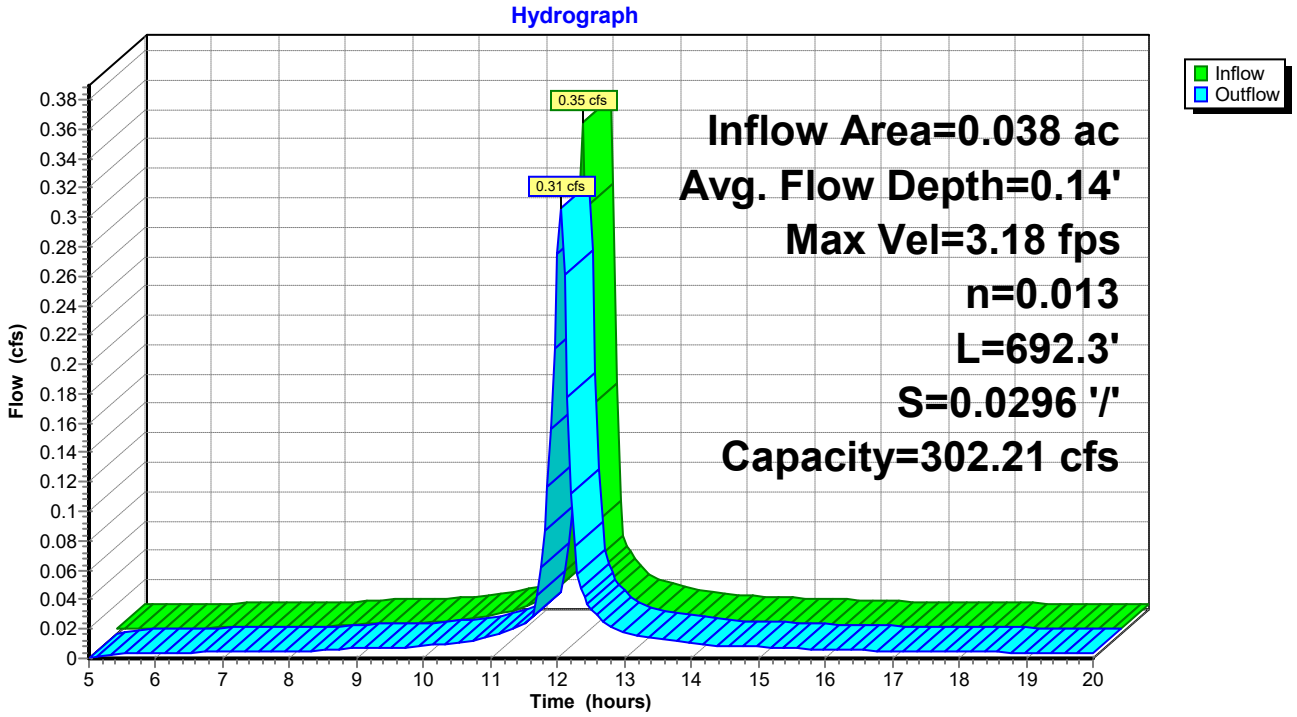


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.49	0.00
3.00	-1.02	1.51
6.00	0.00	0.49
28.02	0.00	0.49
31.02	-1.02	1.51
34.02	0.49	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
1.02	5.1	32.9	32.1	3,538	29.07
1.51	21.4	35.1	34.0	14,795	302.21

Reach 10R: Roadway & Ditches



Summary for Reach 12R: Roadway & Ditches S

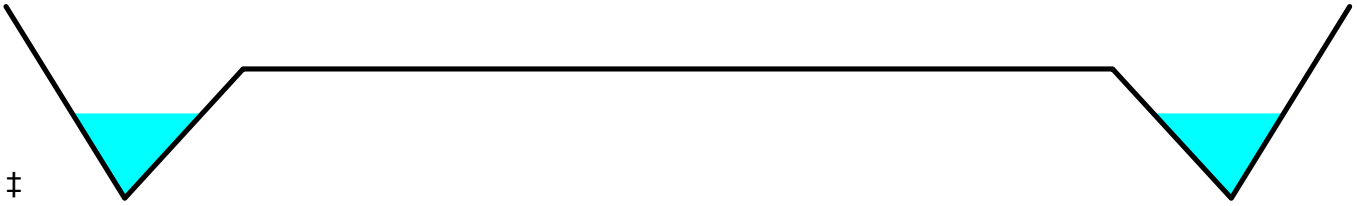
[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.556 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 14.22 cfs @ 11.95 hrs, Volume= 0.722 af
Outflow = 11.31 cfs @ 12.11 hrs, Volume= 0.717 af, Atten= 20%, Lag= 9.5 min
Routed to Reach 21R : WWTP Channel

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.20 fps, Min. Travel Time= 6.4 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 15.4 min

Peak Storage= 4,396 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.67' , Surface Width= 6.60'
Bank-Full Depth= 1.51' Flow Area= 21.4 sf, Capacity= 174.58 cfs

Custom cross-section, Length= 1,991.5' Slope= 0.0099 '/' (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 844.82', Outlet Invert= 825.13'

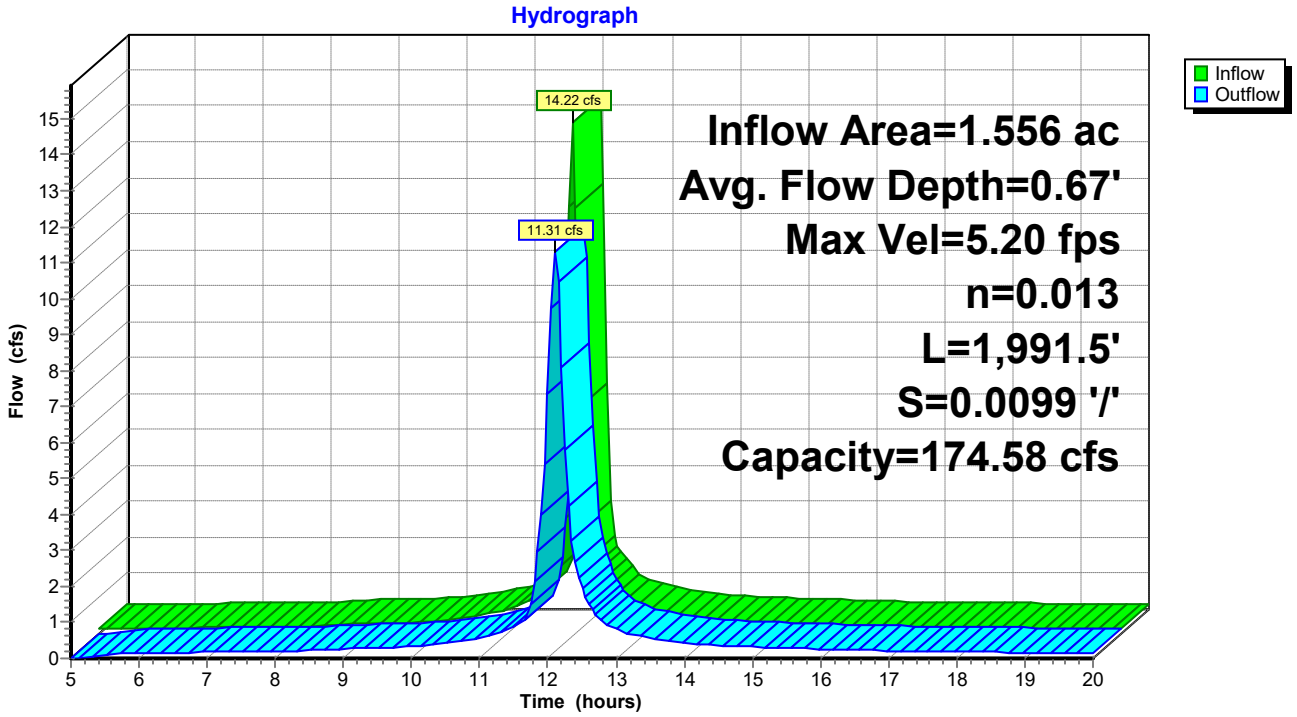


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.49	0.00
3.00	-1.02	1.51
6.00	0.00	0.49
28.02	0.00	0.49
31.02	-1.02	1.51
34.02	0.49	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
1.02	5.1	32.9	32.1	10,178	16.79
1.51	21.4	35.1	34.0	42,562	174.58

Reach 12R: Roadway & Ditches S



Summary for Reach 17R: Non-Contact Bypass Spillway

Inflow Area = 154.690 ac, 78.86% Impervious, Inflow Depth > 1.13" for 100-year, 24-hour event
Inflow = 33.44 cfs @ 14.72 hrs, Volume= 14.545 af
Outflow = 33.42 cfs @ 14.89 hrs, Volume= 14.214 af, Atten= 0%, Lag= 10.3 min
Routed to Link 3L : Outfall (To Existing Overland Flow)

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 6.2 min
Avg. Velocity = 2.55 fps, Avg. Travel Time= 7.2 min

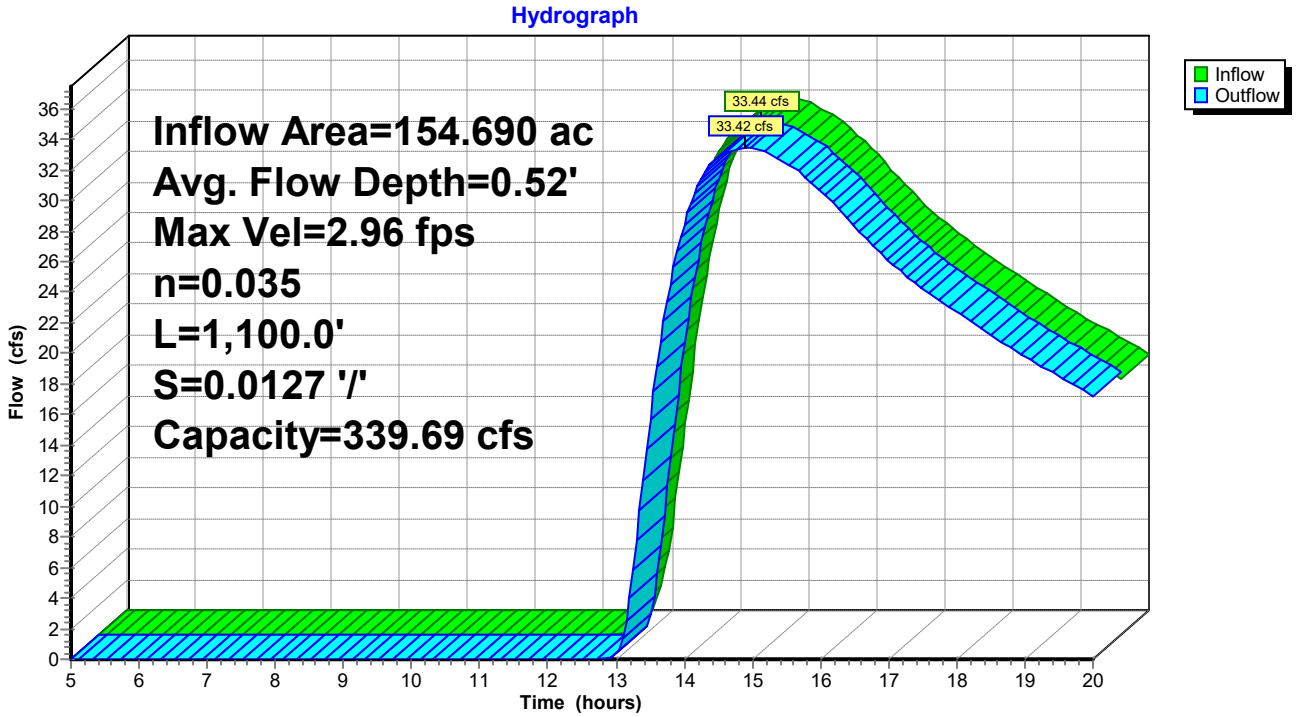
Peak Storage= 12,436 cf @ 14.78 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 23.14'
Bank-Full Depth= 2.00' Flow Area= 52.0 sf, Capacity= 339.69 cfs

20.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 32.00'
Length= 1,100.0' Slope= 0.0127 '/'
Inlet Invert= 810.00', Outlet Invert= 796.00'



‡

Reach 17R: Non-Contact Bypass Spillway



Summary for Reach 19R: Roadway & Ditches W

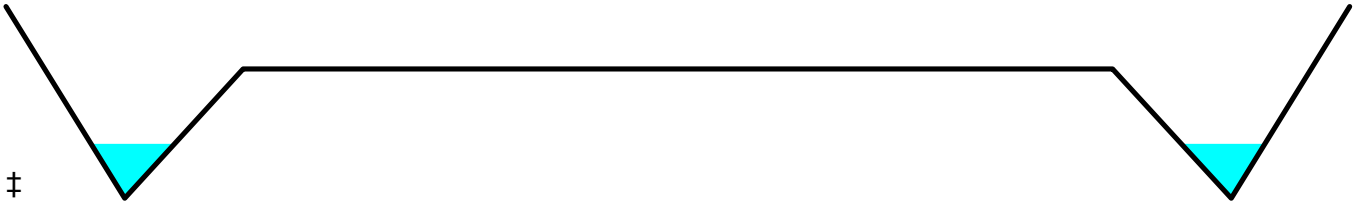
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.610 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 5.57 cfs @ 11.95 hrs, Volume= 0.283 af
Outflow = 5.16 cfs @ 12.00 hrs, Volume= 0.283 af, Atten= 7%, Lag= 2.7 min
Routed to Reach 21R : WWTP Channel

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.84 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 2.34 fps, Avg. Travel Time= 4.1 min

Peak Storage= 519 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 4.23'
Bank-Full Depth= 1.51' Flow Area= 21.4 sf, Capacity= 265.47 cfs

Custom cross-section, Length= 574.1' Slope= 0.0229 '/' (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 838.25', Outlet Invert= 825.13'

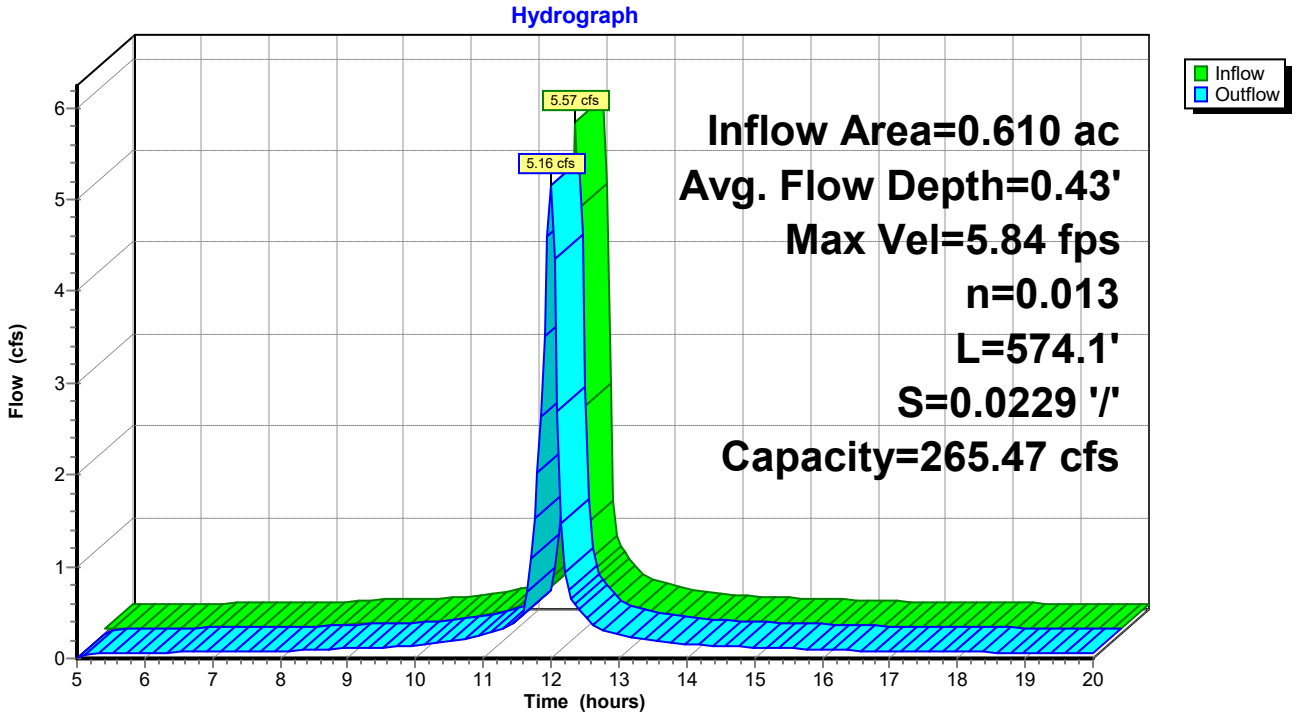


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.49	0.00
3.00	-1.02	1.51
6.00	0.00	0.49
28.02	0.00	0.49
31.02	-1.02	1.51
34.02	0.49	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
1.02	5.1	32.9	32.1	2,934	25.53
1.51	21.4	35.1	34.0	12,271	265.47

Reach 19R: Roadway & Ditches W



Summary for Reach 20R: Roadway & Ditches E

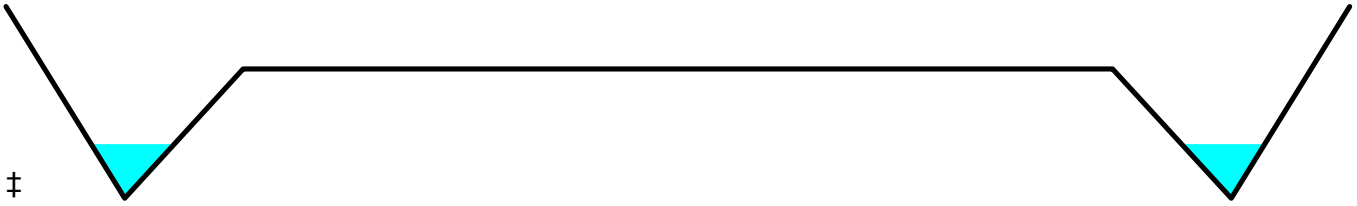
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.592 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 5.41 cfs @ 11.95 hrs, Volume= 0.275 af
Outflow = 4.93 cfs @ 12.01 hrs, Volume= 0.274 af, Atten= 9%, Lag= 3.7 min
Routed to Reach 21R : WWTP Channel

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.65 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 5.5 min

Peak Storage= 680 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 4.21'
Bank-Full Depth= 1.51' Flow Area= 21.4 sf, Capacity= 258.34 cfs

Custom cross-section, Length= 757.9' Slope= 0.0216 '/' (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 841.54', Outlet Invert= 825.13'

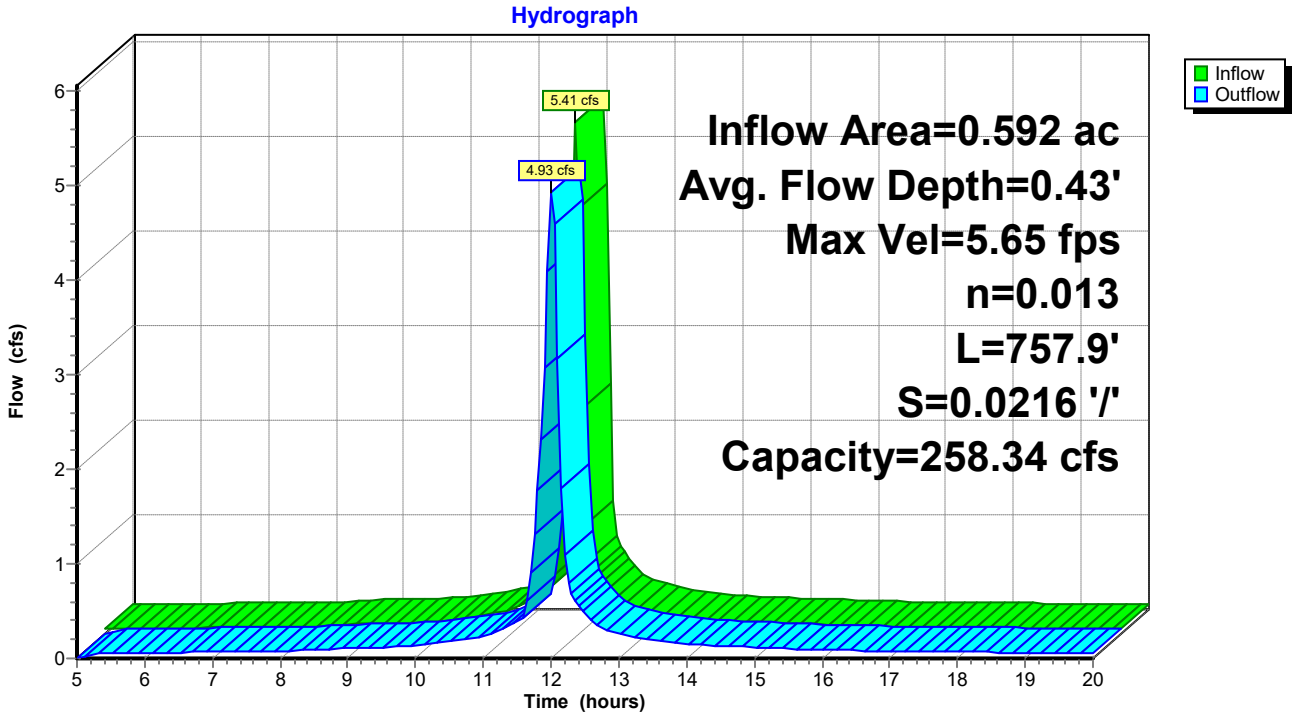


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.49	0.00
3.00	-1.02	1.51
6.00	0.00	0.49
28.02	0.00	0.49
31.02	-1.02	1.51
34.02	0.49	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
1.02	5.1	32.9	32.1	3,873	24.85
1.51	21.4	35.1	34.0	16,197	258.34

Reach 20R: Roadway & Ditches E



Summary for Reach 21R: WWTP Channel

[82] Warning: Early inflow requires earlier time span
[62] Hint: Exceeded Reach 12R OUTLET depth by 0.64' @ 11.95 hrs
[62] Hint: Exceeded Reach 19R OUTLET depth by 0.85' @ 11.95 hrs
[62] Hint: Exceeded Reach 20R OUTLET depth by 0.86' @ 11.95 hrs

Inflow Area = 14.087 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 117.78 cfs @ 11.95 hrs, Volume= 6.537 af
Outflow = 113.34 cfs @ 11.97 hrs, Volume= 6.530 af, Atten= 4%, Lag= 1.0 min
Routed to Pond 1P : Existing Bedell/Future Contact Pond

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 13.25 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 4.60 fps, Avg. Travel Time= 1.6 min

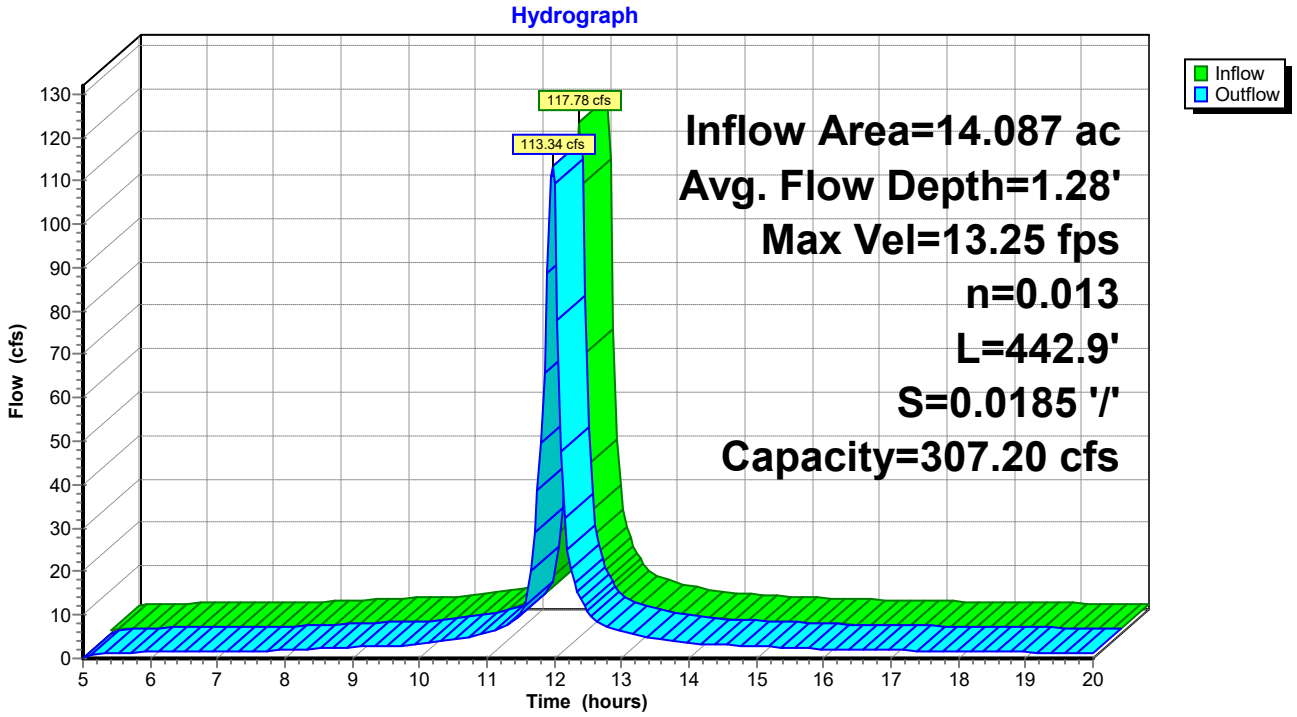
Peak Storage= 3,875 cf @ 11.96 hrs
Average Depth at Peak Storage= 1.28' , Surface Width= 10.67'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 307.20 cfs

2.99' x 2.00' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 3.0 '/' Top Width= 14.99'
Length= 442.9' Slope= 0.0185 '/'
Inlet Invert= 825.13', Outlet Invert= 816.93'



‡

Reach 21R: WWTP Channel



Summary for Reach 22R: North Roadway & Ditches

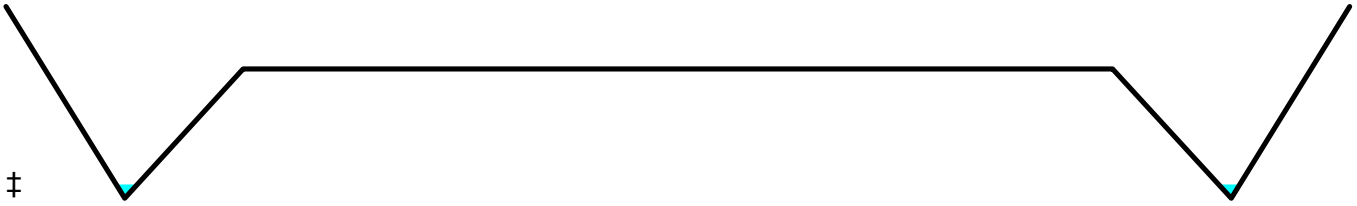
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.020 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 0.18 cfs @ 11.95 hrs, Volume= 0.009 af
Outflow = 0.17 cfs @ 11.99 hrs, Volume= 0.009 af, Atten= 7%, Lag= 2.3 min
Routed to Pond 24P : Sump 4

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.04 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 3.3 min

Peak Storage= 14 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 1.06'
Bank-Full Depth= 1.51' Flow Area= 21.4 sf, Capacity= 346.60 cfs

Custom cross-section, Length= 252.6' Slope= 0.0390 '/' (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 830.05', Outlet Invert= 820.21'

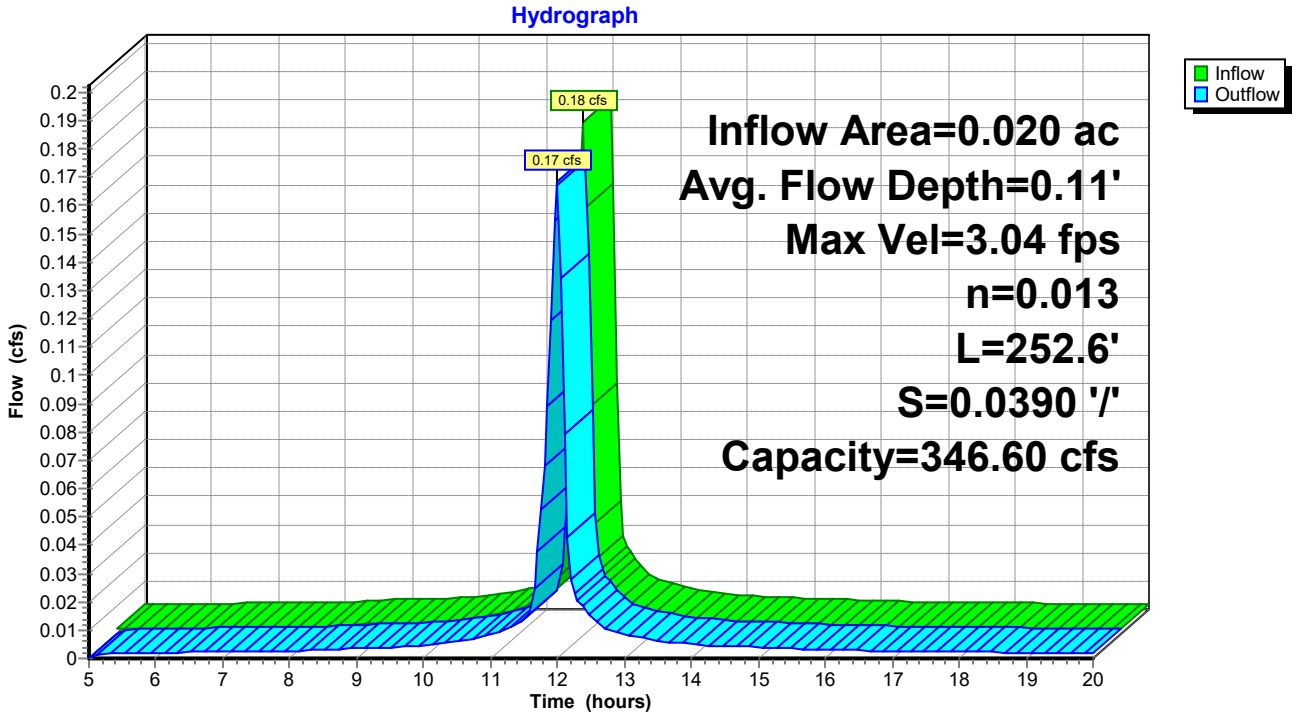


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.49	0.00
3.00	-1.02	1.51
6.00	0.00	0.49
28.02	0.00	0.49
31.02	-1.02	1.51
34.02	0.49	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
1.02	5.1	32.9	32.1	1,291	33.33
1.51	21.4	35.1	34.0	5,399	346.60

Reach 22R: North Roadway & Ditches



Summary for Reach 23R: Roadway & Ditches

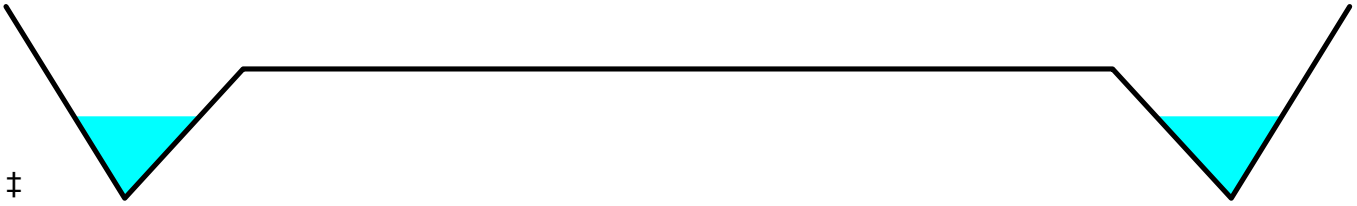
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.904 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 8.27 cfs @ 11.95 hrs, Volume= 0.420 af
Outflow = 6.77 cfs @ 12.10 hrs, Volume= 0.417 af, Atten= 18%, Lag= 8.8 min
Routed to Pond 26P : Sump 2

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.32 fps, Min. Travel Time= 5.8 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 14.1 min

Peak Storage= 2,377 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.64' , Surface Width= 6.37'
Bank-Full Depth= 1.51' Flow Area= 21.4 sf, Capacity= 114.46 cfs

Custom cross-section, Length= 1,158.1' Slope= 0.0042 '/' (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 829.23', Outlet Invert= 824.31'

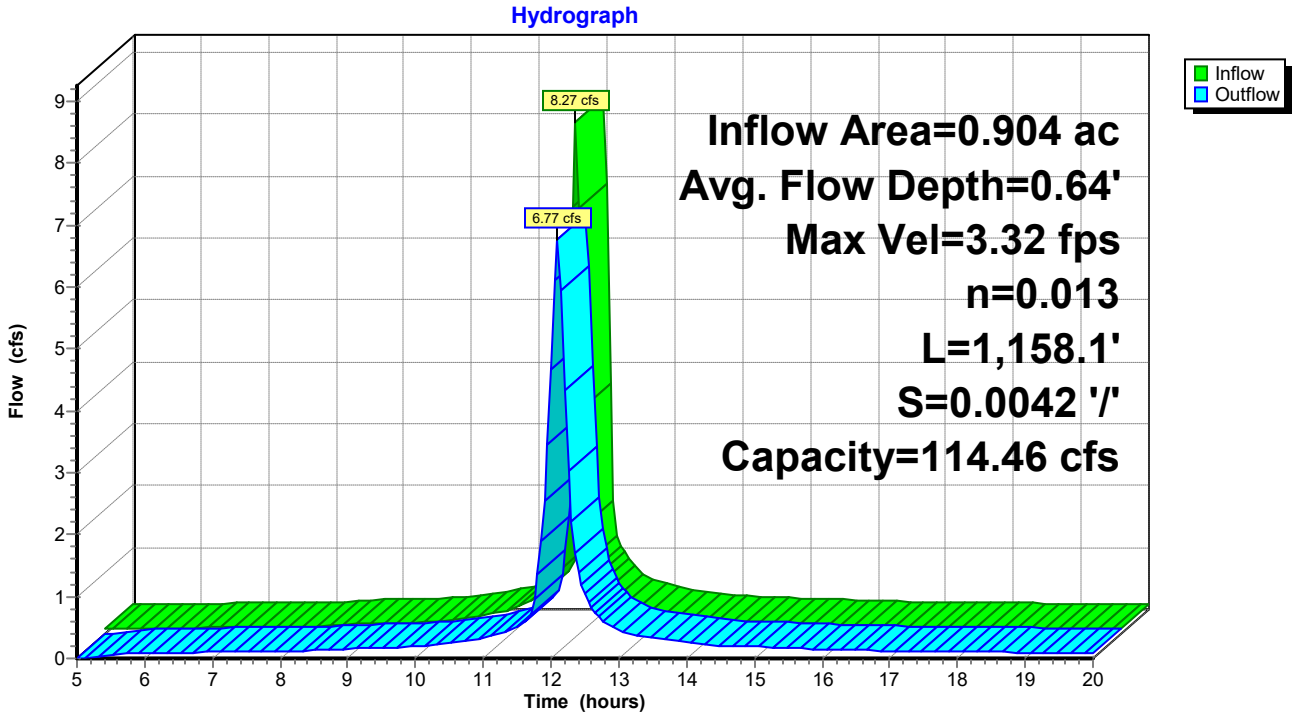


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Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.49	0.00
3.00	-1.02	1.51
6.00	0.00	0.49
28.02	0.00	0.49
31.02	-1.02	1.51
34.02	0.49	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
1.02	5.1	32.9	32.1	5,919	11.01
1.51	21.4	35.1	34.0	24,752	114.46

Reach 23R: Roadway & Ditches



Summary for Reach 26R: West Roadway & Ditches

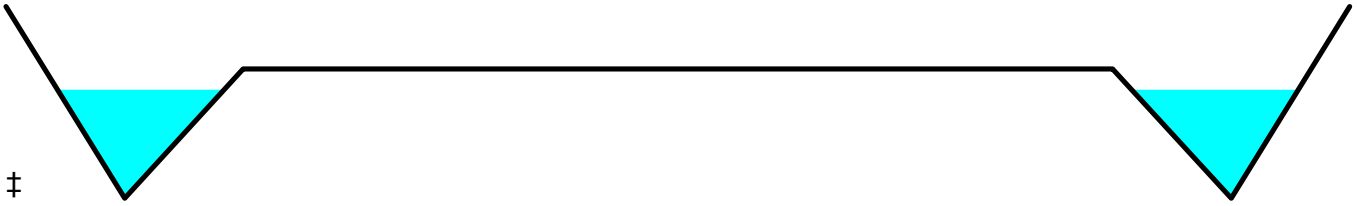
[82] Warning: Early inflow requires earlier time span

Inflow Area = 3.845 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 35.14 cfs @ 11.95 hrs, Volume= 1.786 af
Outflow = 21.57 cfs @ 12.26 hrs, Volume= 1.760 af, Atten= 39%, Lag= 18.4 min
Routed to Pond 26P : Sump 2

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.08 fps, Min. Travel Time= 13.5 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 30.4 min

Peak Storage= 17,695 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.85' , Surface Width= 8.43'
Bank-Full Depth= 1.51' Flow Area= 21.4 sf, Capacity= 174.12 cfs

Custom cross-section, Length= 4,921.3' Slope= 0.0098 '/' (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 868.60', Outlet Invert= 820.21'

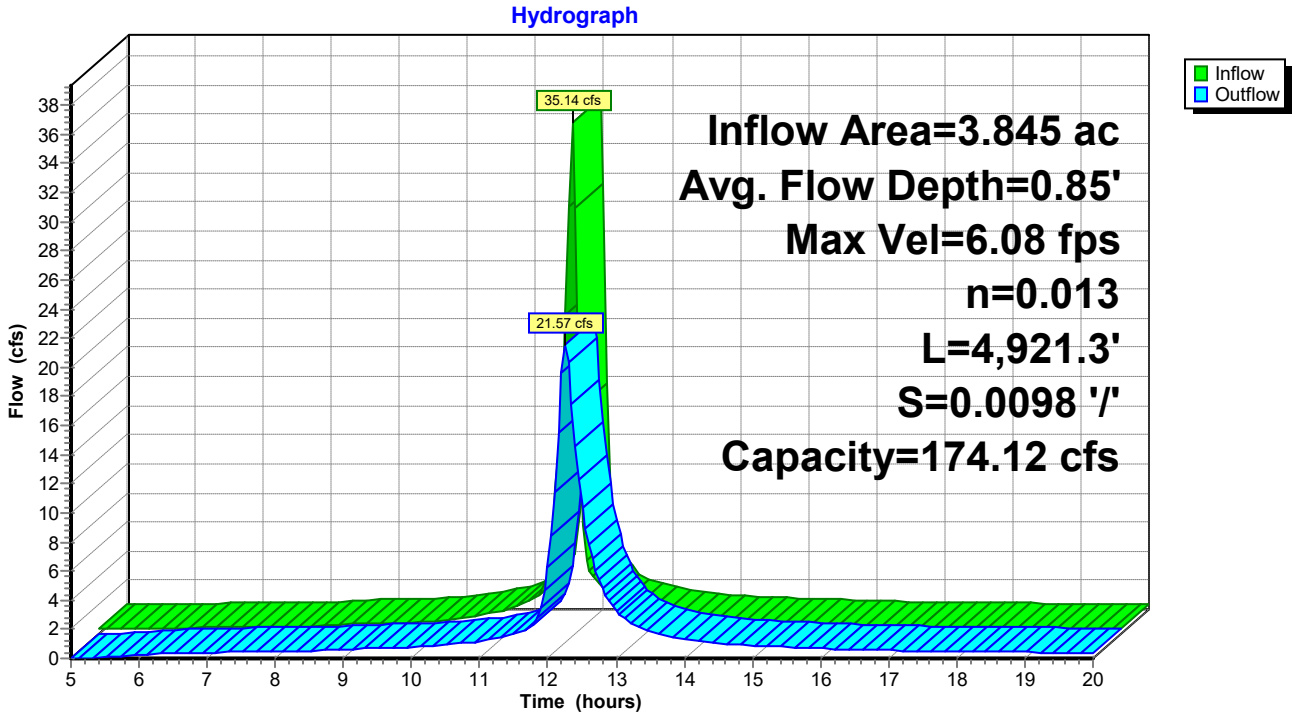


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.49	0.00
3.00	-1.02	1.51
6.00	0.00	0.49
28.02	0.00	0.49
31.02	-1.02	1.51
34.02	0.49	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
1.02	5.1	32.9	32.1	25,151	16.75
1.51	21.4	35.1	34.0	105,179	174.12

Reach 26R: West Roadway & Ditches



Summary for Reach 27R: East Roadway & Ditches

[82] Warning: Early inflow requires earlier time span
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 5.755 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 52.59 cfs @ 11.95 hrs, Volume= 2.673 af
Outflow = 27.60 cfs @ 12.39 hrs, Volume= 2.644 af, Atten= 48%, Lag= 26.3 min
Routed to Pond 26P : Sump 2

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.46 fps, Min. Travel Time= 10.5 min
Avg. Velocity = 2.87 fps, Avg. Travel Time= 23.7 min

Peak Storage= 25,853 cf @ 12.06 hrs
Average Depth at Peak Storage= 1.06' , Surface Width= 32.22'
Bank-Full Depth= 1.51' Flow Area= 21.4 sf, Capacity= 167.25 cfs

Custom cross-section, Length= 4,068.2' Slope= 0.0091 '/' (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 861.22', Outlet Invert= 824.31'

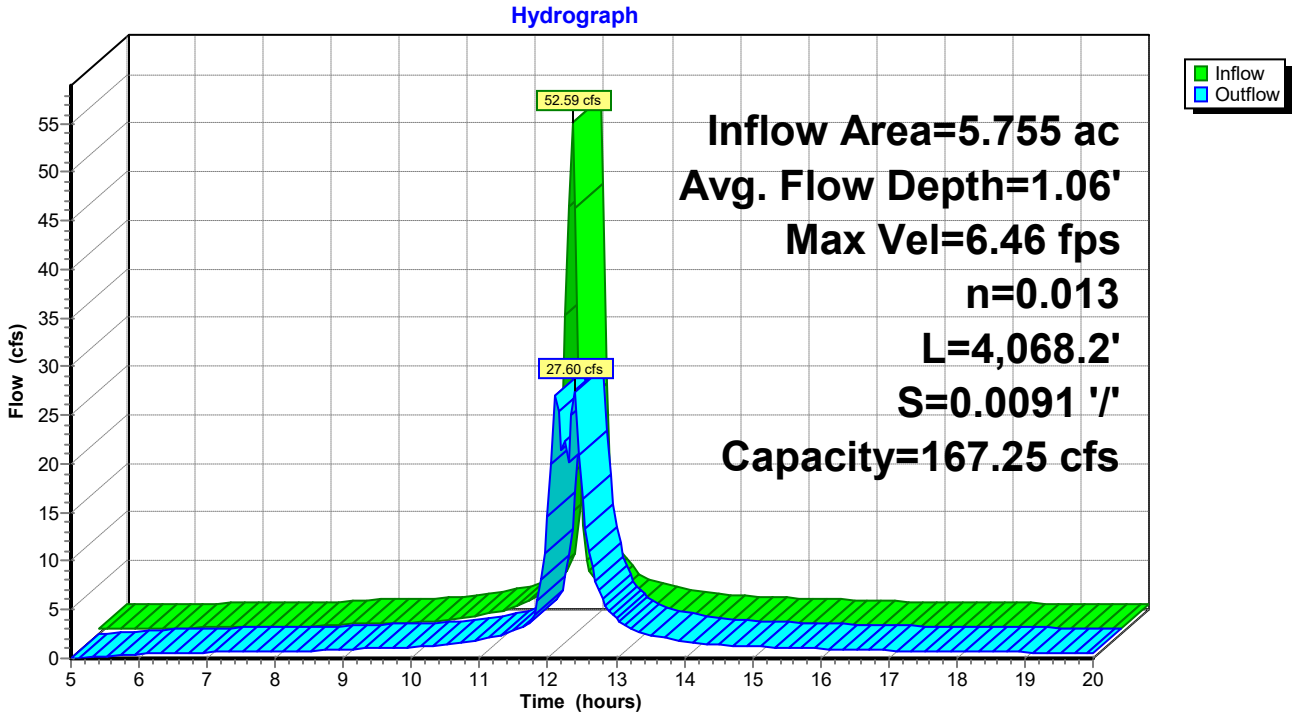


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.49	0.00
3.00	-1.02	1.51
6.00	0.00	0.49
28.02	0.00	0.49
31.02	-1.02	1.51
34.02	0.49	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Width (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0.0	0	0.00
1.02	5.1	32.9	32.1	20,792	16.09
1.51	21.4	35.1	34.0	86,948	167.25

Reach 27R: East Roadway & Ditches



Summary for Pond 1P: Existing Bedell/Future Contact Pond

[62] Hint: Exceeded Reach 2R OUTLET depth by 10.58' @ 19.95 hrs
[62] Hint: Exceeded Reach 5R OUTLET depth by 1.06' @ 19.95 hrs

Inflow Area = 94.763 ac, 78.87% Impervious, Inflow Depth > 5.08" for 100-year, 24-hour event
Inflow = 525.57 cfs @ 12.02 hrs, Volume= 40.141 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link 1L : Outfall (To Effluent TP)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 816.20' @ 20.00 hrs Surf.Area= 4.022 ac Storage= 40.124 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

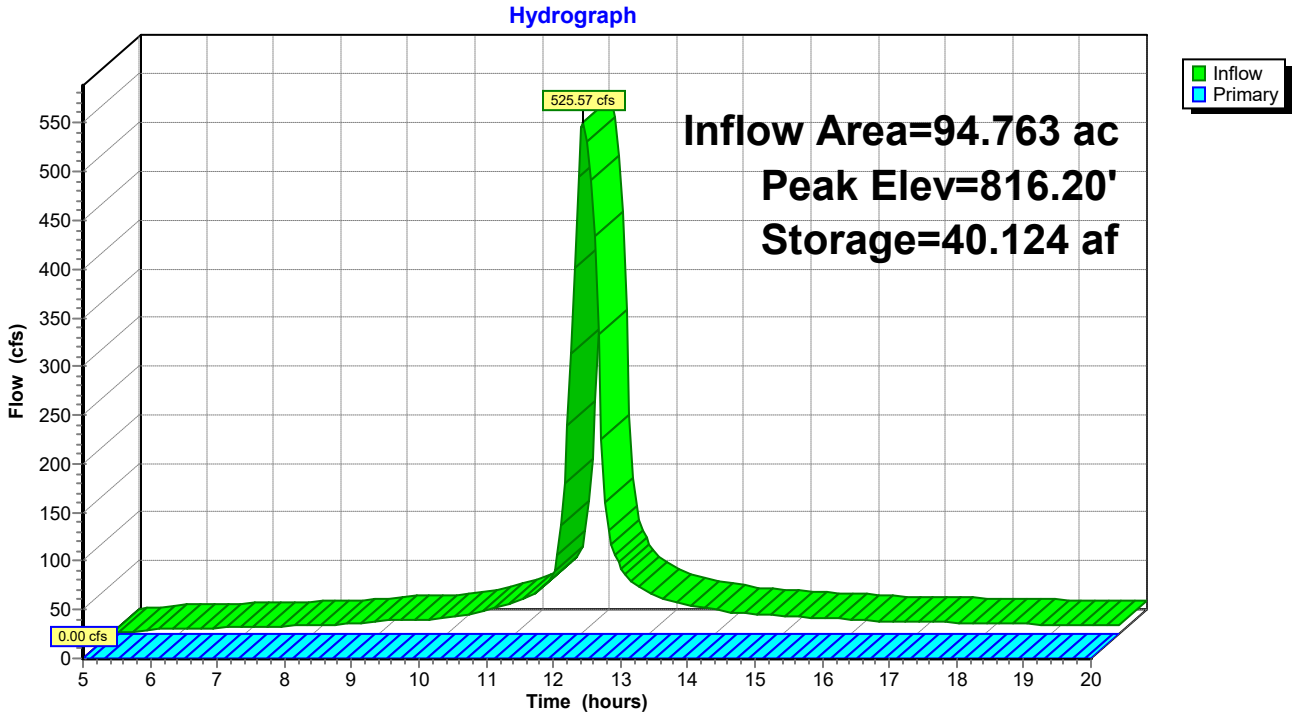
Volume	Invert	Avail.Storage	Storage Description
#1	803.71'	73.055 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
803.71	0.000	0.000	0.000
803.81	2.480	0.122	0.122
807.09	2.860	8.760	8.882
810.37	3.260	10.039	18.921
813.65	3.680	11.384	30.306
816.93	4.120	12.795	43.101
820.21	4.570	14.255	57.356
823.49	5.000	15.699	73.055

Device	Routing	Invert	Outlet Devices
#1	Primary	821.49'	**50.0' long + 2.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.48 2.55 2.70 2.70 2.68 2.70 2.66 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=803.71' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: Existing Bedell/Future Contact Pond



Summary for Pond 2P: Proposed SE Contact Sump

[82] Warning: Early inflow requires earlier time span

Inflow Area = 70.391 ac, 72.00% Impervious, Inflow Depth > 4.96" for 100-year, 24-hour event
Inflow = 601.42 cfs @ 11.95 hrs, Volume= 29.075 af
Outflow = 432.92 cfs @ 12.02 hrs, Volume= 29.019 af, Atten= 28%, Lag= 3.9 min
Primary = 432.92 cfs @ 12.02 hrs, Volume= 29.019 af
Routed to Reach 2R : Proposed Contact Water Pipe
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 862.43' @ 12.02 hrs Surf.Area= 0.357 ac Storage= 2.691 af

Plug-Flow detention time= 3.9 min calculated for 29.015 af (100% of inflow)
Center-of-Mass det. time= 2.9 min (748.2 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1	846.36'	3.495 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

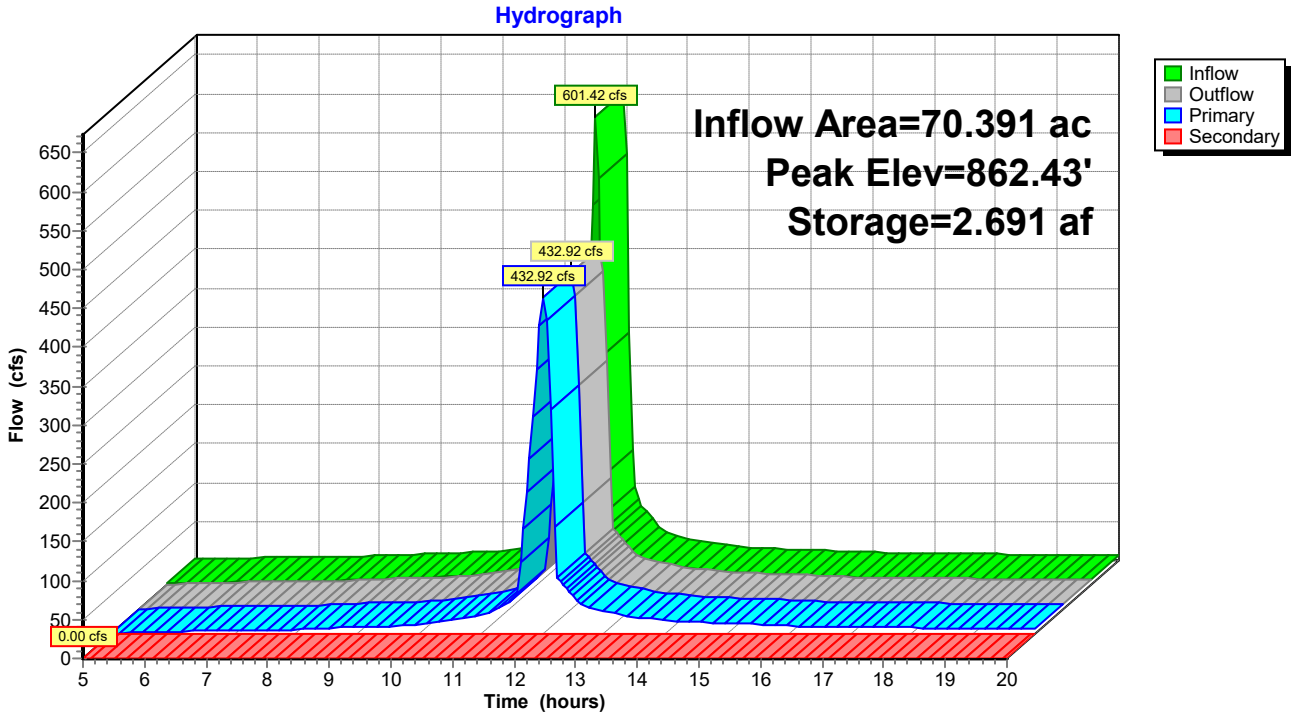
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
846.36	0.000	0.000	0.000
846.46	0.064	0.003	0.003
849.74	0.090	0.253	0.256
853.02	0.110	0.328	0.584
856.30	0.180	0.475	1.059
859.58	0.270	0.738	1.797
862.86	0.370	1.050	2.847
864.50	0.420	0.648	3.495

Device	Routing	Invert	Outlet Devices
#1	Primary	846.46'	**72.0" Round RCP_Round 72"** L= 100.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 846.46' / 843.18' S= 0.0328 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 28.28 sf
#2	Secondary	863.50'	**20.0' long + 2.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.48 2.55 2.70 2.70 2.68 2.70 2.66 2.64

Primary OutFlow Max=428.50 cfs @ 12.02 hrs HW=862.18' (Free Discharge)
└**1=RCP_Round 72"** (Inlet Controls 428.50 cfs @ 15.15 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=846.48' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Proposed SE Contact Sump



Summary for Pond 3P: Non-Contact Ponds

Inflow Area = 154.690 ac, 78.86% Impervious, Inflow Depth > 5.19" for 100-year, 24-hour event
Inflow = 1,001.69 cfs @ 12.09 hrs, Volume= 66.870 af
Outflow = 33.44 cfs @ 14.72 hrs, Volume= 14.545 af, Atten= 97%, Lag= 157.6 min
Primary = 33.44 cfs @ 14.72 hrs, Volume= 14.545 af
Routed to Reach 17R : Non-Contact Bypass Spillway

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 826.70' @ 14.72 hrs Surf.Area= 6.737 ac Storage= 53.968 af

Plug-Flow detention time= 381.4 min calculated for 14.496 af (22% of inflow)
Center-of-Mass det. time= 225.8 min (976.6 - 750.8)

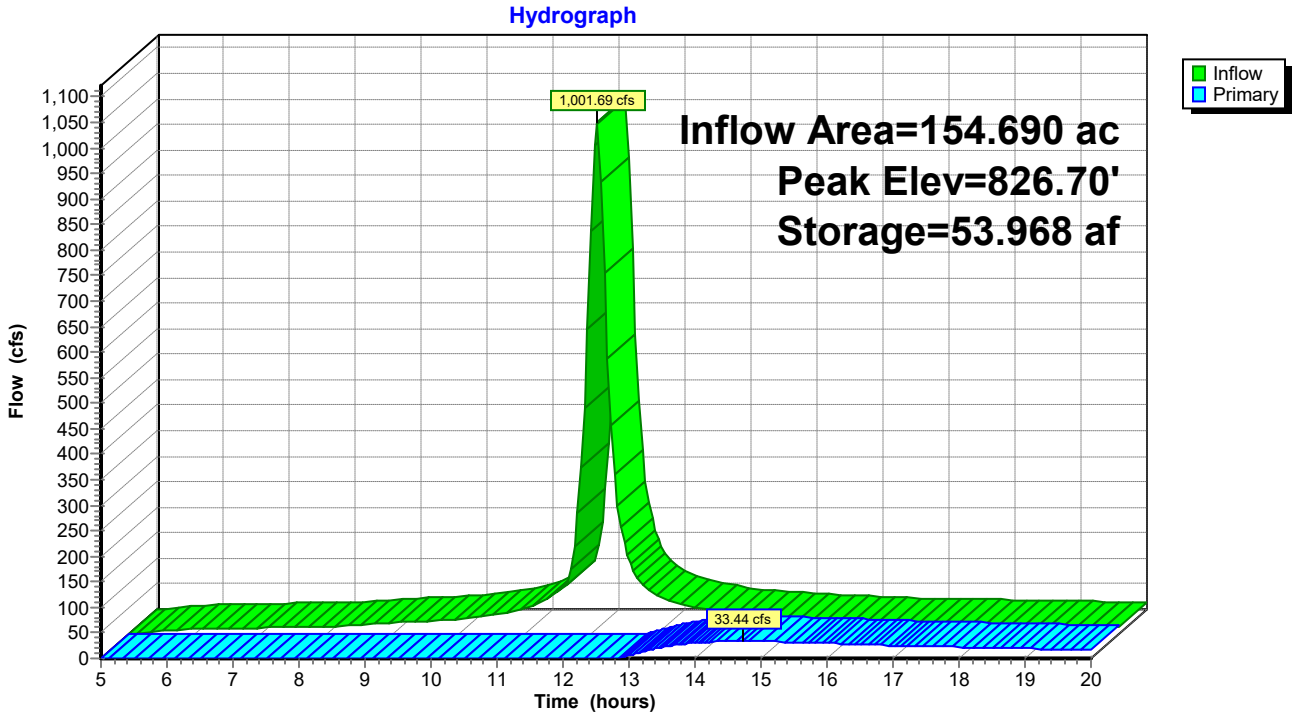
Volume	Invert	Avail.Storage	Storage Description
#1	810.00'	78.690 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
810.00	0.100	0.000	0.000
820.00	3.702	19.010	19.010
830.00	8.234	59.680	78.690

Device	Routing	Invert	Outlet Devices
#1	Primary	826.00'	**20.0' long + 2.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=33.14 cfs @ 14.72 hrs HW=826.70' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 33.14 cfs @ 2.22 fps)

Pond 3P: Non-Contact Ponds



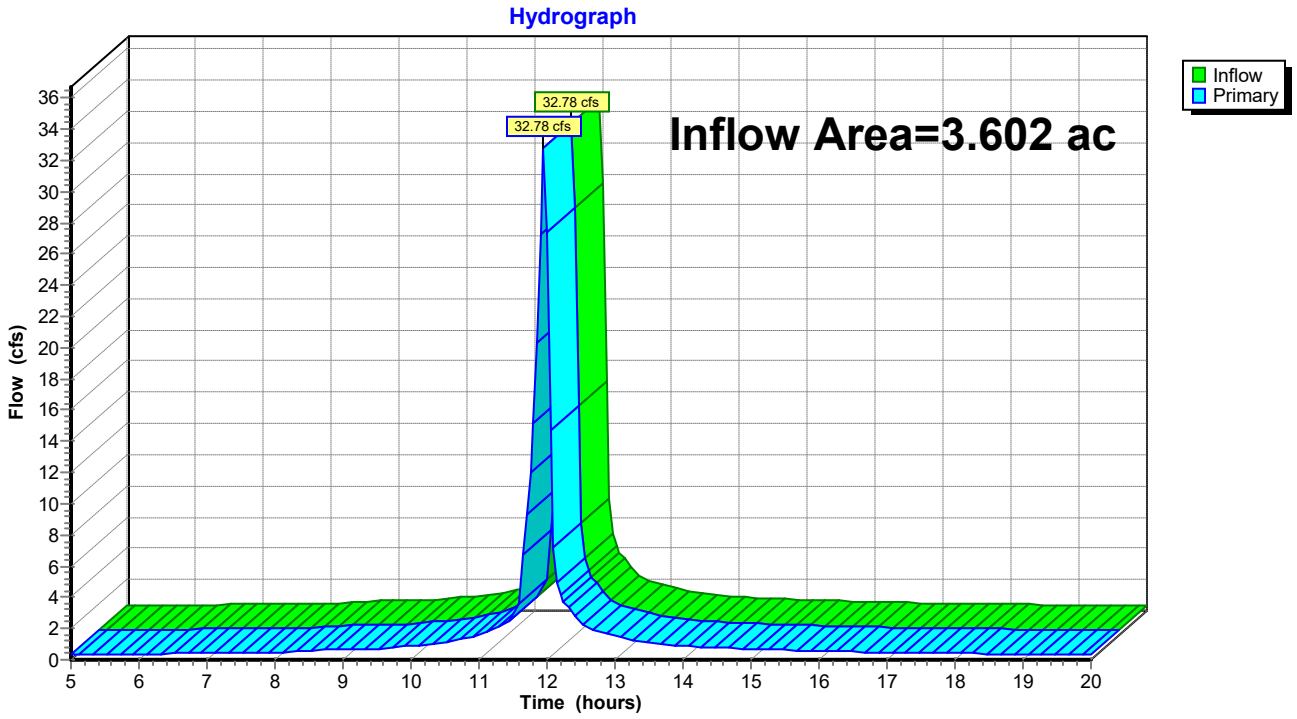
Summary for Pond 11P: Sump 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.602 ac,100.00% Impervious, Inflow Depth > 5.57" for 100-year, 24-hour event
Inflow = 32.78 cfs @ 11.95 hrs, Volume= 1.673 af
Primary = 32.78 cfs @ 11.95 hrs, Volume= 1.673 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 1P : Existing Bedell/Future Contact Pond

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 11P: Sump 3



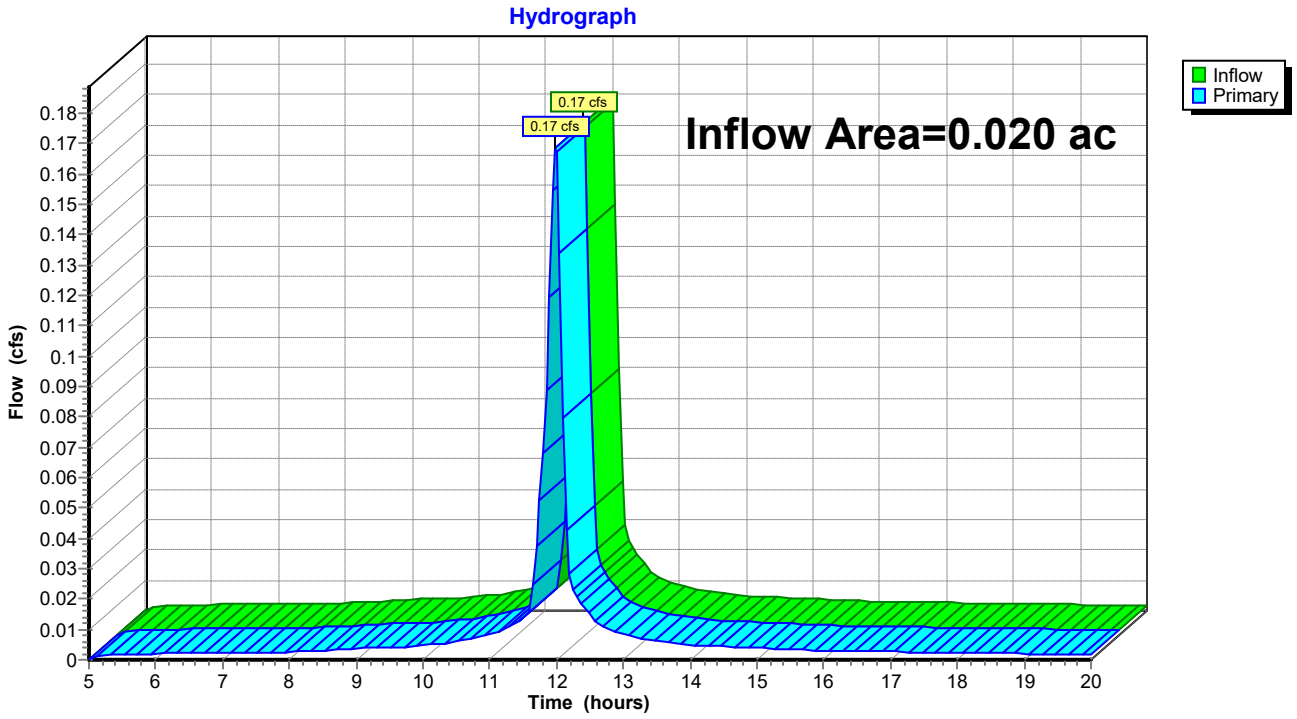
Summary for Pond 24P: Sump 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.020 ac,100.00% Impervious, Inflow Depth > 5.56" for 100-year, 24-hour event
Inflow = 0.17 cfs @ 11.99 hrs, Volume= 0.009 af
Primary = 0.17 cfs @ 11.99 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 26P : Sump 2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 24P: Sump 4



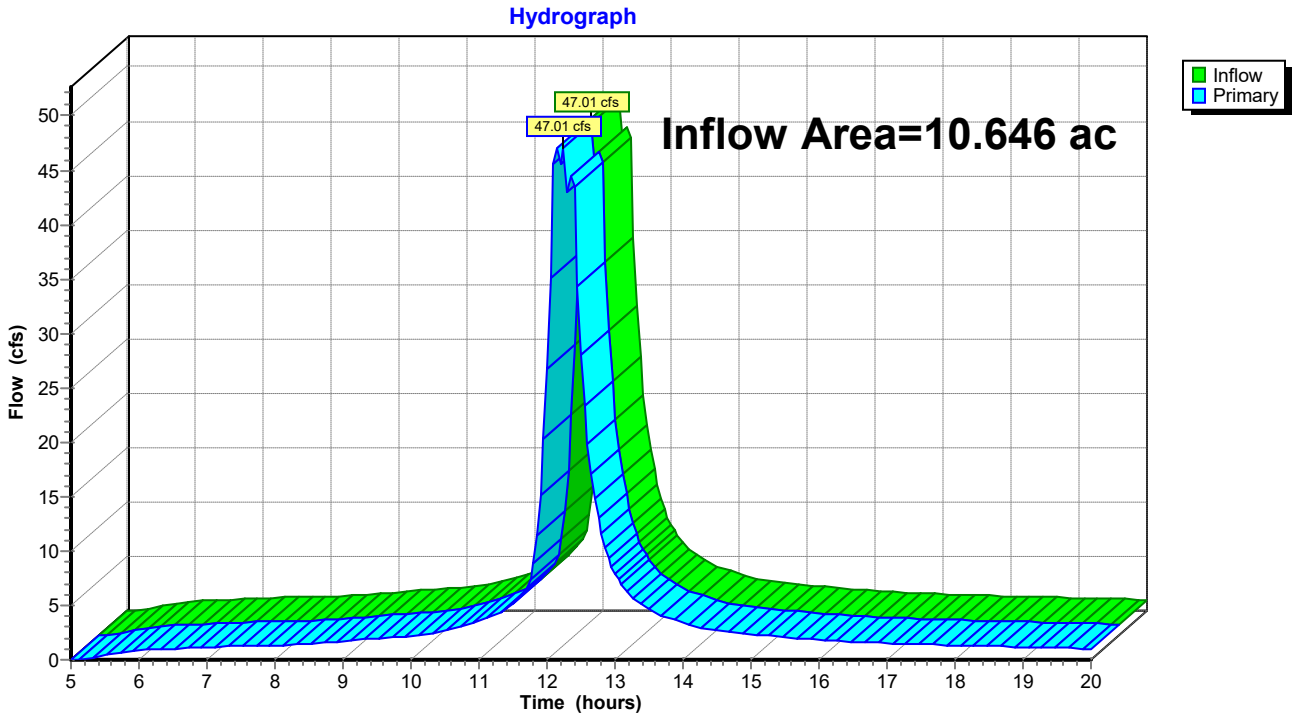
Summary for Pond 26P: Sump 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.646 ac,100.00% Impervious, Inflow Depth > 5.51" for 100-year, 24-hour event
Inflow = 47.01 cfs @ 12.25 hrs, Volume= 4.887 af
Primary = 47.01 cfs @ 12.25 hrs, Volume= 4.887 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : To Tailings Pond

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 26P: Sump 2

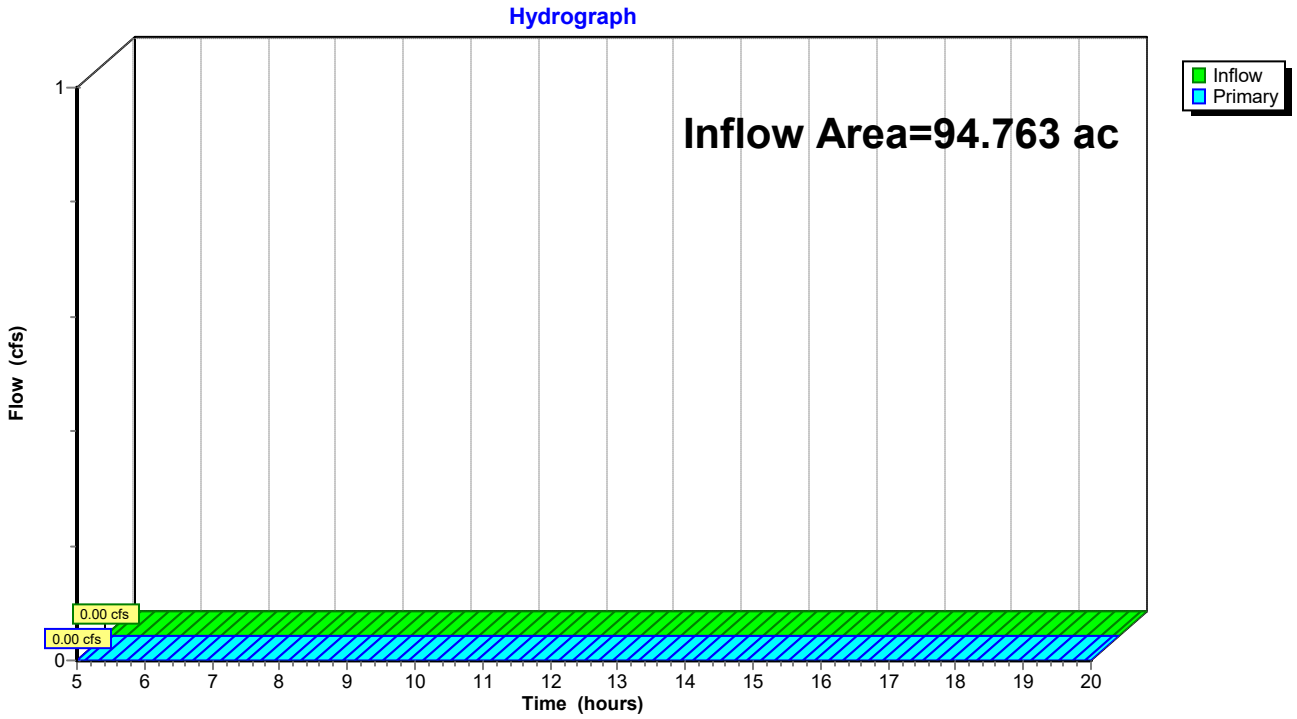


Summary for Link 1L: Outfall (To Effluent TP)

Inflow Area = 94.763 ac, 78.87% Impervious, Inflow Depth = 0.00" for 100-year, 24-hour event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: Outfall (To Effluent TP)

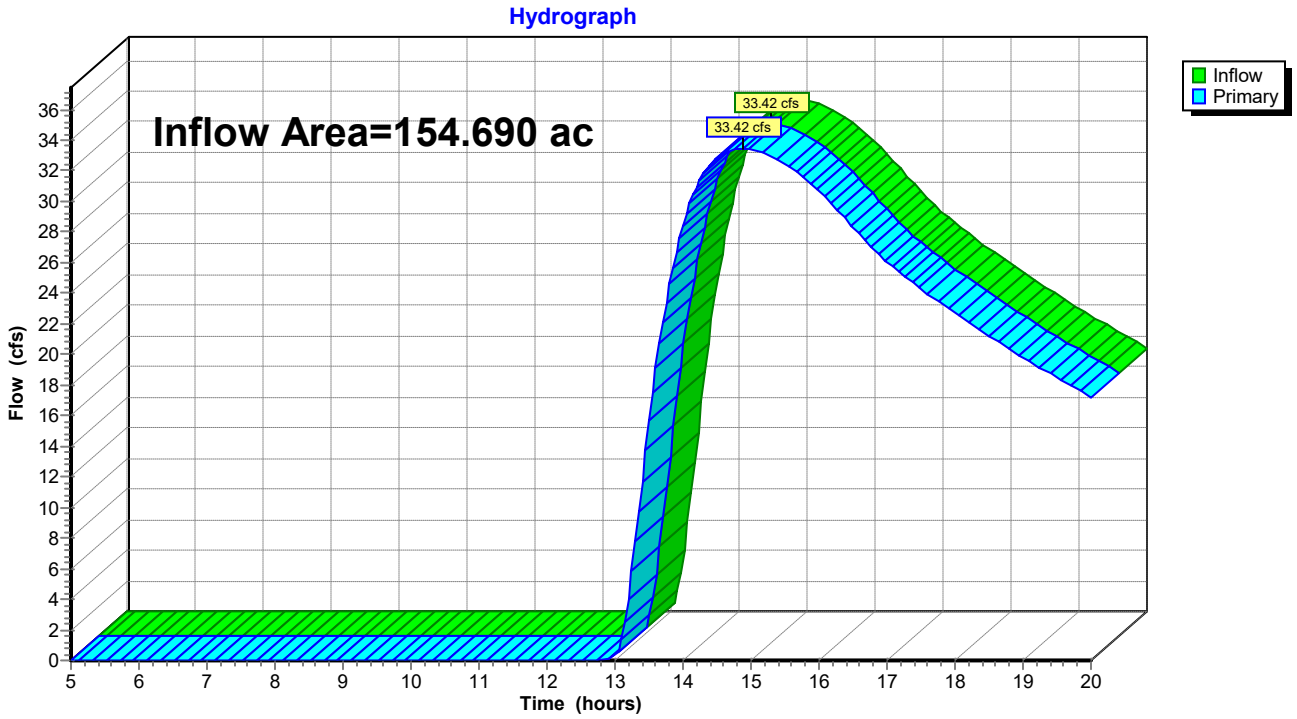


Summary for Link 3L: Outfall (To Existing Overland Flow)

Inflow Area = 154.690 ac, 78.86% Impervious, Inflow Depth > 1.10" for 100-year, 24-hour event
Inflow = 33.42 cfs @ 14.89 hrs, Volume= 14.214 af
Primary = 33.42 cfs @ 14.89 hrs, Volume= 14.214 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 3L: Outfall (To Existing Overland Flow)

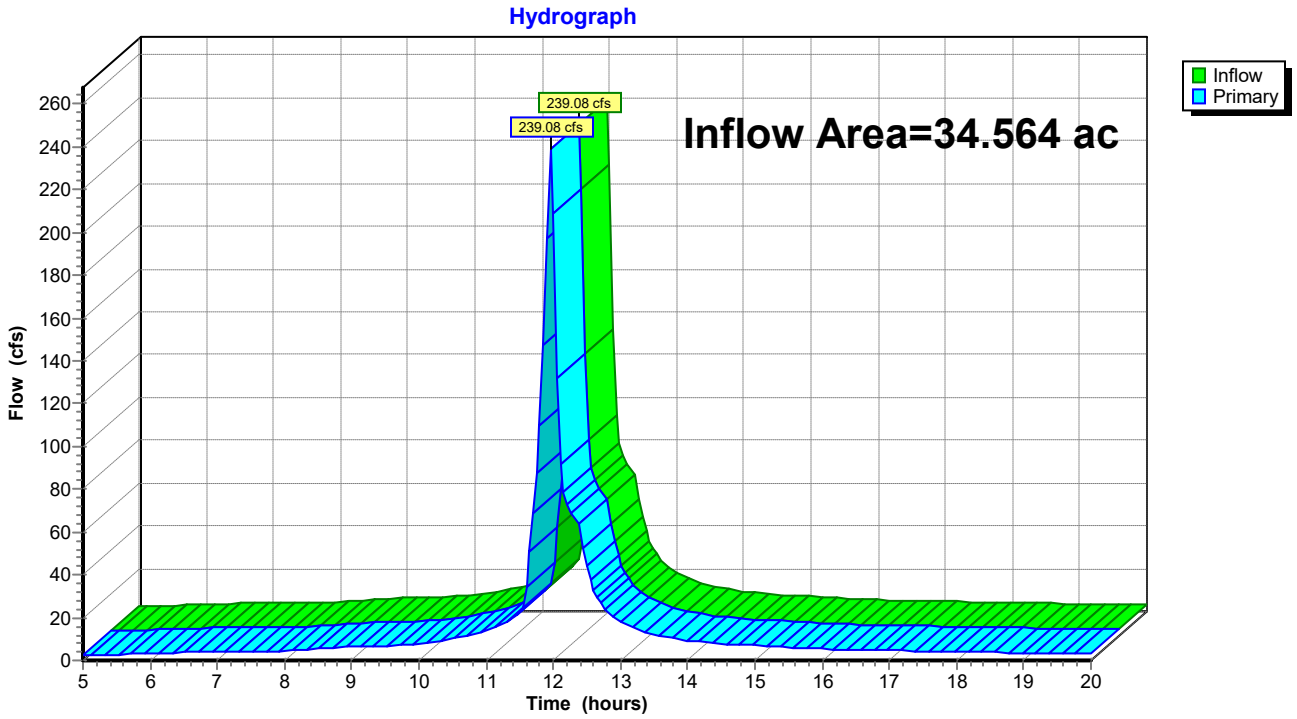


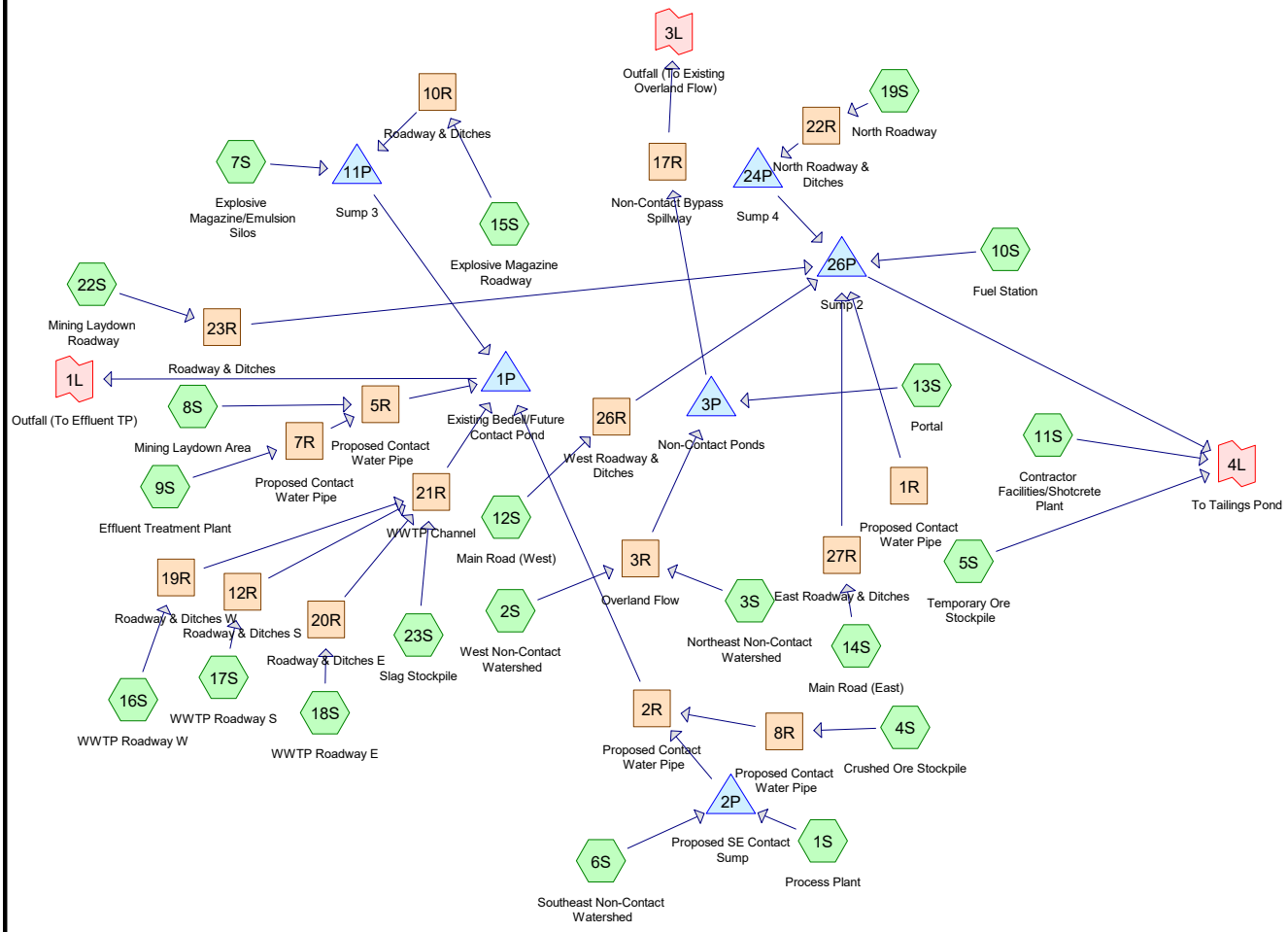
Summary for Link 4L: To Tailings Pond

Inflow Area = 34.564 ac,100.00% Impervious, Inflow Depth > 5.55" for 100-year, 24-hour event
Inflow = 239.08 cfs @ 11.95 hrs, Volume= 15.996 af
Primary = 239.08 cfs @ 11.95 hrs, Volume= 15.996 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 4L: To Tailings Pond





Subcat Reach Pond Link

Routing Diagram for White Pine Copper_Contact Areas_Metric_20260410, Revised 04/09/2026

Prepared by Foth & Van Dyke, LLC, Printed 4/10/2026

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Area Listing (all nodes)

Area (hectares)	CN	Description (subcatchment-numbers)
9.4656	98	Paved parking, HSG C (2S)
5.3903	98	Paved roads w/curbs & sewers, HSG C (12S, 14S, 15S, 16S, 17S, 18S, 19S, 22S)
27.8382	98	Unconnected pavement, HSG C (2S, 3S, 4S, 5S, 7S, 8S, 10S, 11S, 13S, 23S)
70.7018	91	Urban industrial, 72% imp, HSG C (1S, 2S, 3S, 6S, 9S)
1.5419	98	Water Surface, 0% imp, HSG C (3S)
114.9378	**94**	**TOTAL AREA**

Soil Listing (all nodes)

Area (hectares)	Soil Group	Subcatchment Numbers
0.0000	HSG A	
0.0000	HSG B	
114.9378	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 22S, 23S
0.0000	HSG D	
0.0000	Other	
114.9378		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (hectares)	HSG-B (hectares)	HSG-C (hectares)	HSG-D (hectares)	Other (hectares)	Total (hectares)	Ground Cover	Subcatch Numbers
0.0000	0.0000	9.4656	0.0000	0.0000	9.4656	Paved parking	
0.0000	0.0000	5.3903	0.0000	0.0000	5.3903	Paved roads w/curbs & sewers	
0.0000	0.0000	27.8382	0.0000	0.0000	27.8382	Unconnected pavement	
0.0000	0.0000	70.7018	0.0000	0.0000	70.7018	Urban industrial, 72% imp	
0.0000	0.0000	1.5419	0.0000	0.0000	1.5419	Water Surface, 0% imp	
0.0000	**0.0000**	**114.9378**	**0.0000**	**0.0000**	**114.9378**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (meters)	Out-Invert (meters)	Length (meters)	Slope (m/m)	n	Width (mm)	Diam/Height (mm)	Inside-Fill (mm)	Node Name
1	1R	255.500	248.360	754.40	0.0095	0.012	0	914	0	
2	2R	257.000	245.400	1,160.00	0.0100	0.012	0	1,829	0	
3	5R	249.022	248.412	30.48	0.0200	0.012	0	914	0	
4	7R	251.765	249.022	198.12	0.0138	0.012	0	457	0	
5	8R	257.861	257.000	91.44	0.0094	0.012	0	610	0	
6	2P	258.000	257.000	30.48	0.0328	0.012	0	1,829	0	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Process Plant Runoff Area=9.0034 ha 72.00% Impervious Runoff Depth>126 mm
Flow Length=106.7 m Slope=0.0050 m/m Tc=5.3 min CN=91 Runoff=5.3826 m³/s 11.335 Ml

Subcatchment 2S: West Non-Contact Runoff Area=35.6690 ha 82.71% Impervious Runoff Depth>133 mm
Flow Length=624.8 m Tc=13.2 min CN=94 Runoff=17.3904 m³/s 47.539 Ml

Subcatchment 3S: Northeast Runoff Area=25.9728 ha 72.79% Impervious Runoff Depth>131 mm
Flow Length=274.3 m Slope=0.0100 m/m Tc=6.0 min CN=93 Runoff=15.4412 m³/s 34.011 Ml

Subcatchment 4S: Crushed Ore Runoff Area=0.9615 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.6149 m³/s 1.361 Ml

Subcatchment 5S: Temporary Ore Runoff Area=7.0678 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=4.5196 m³/s 10.006 Ml

Subcatchment 6S: Southeast Runoff Area=19.4828 ha 72.00% Impervious Runoff Depth>126 mm
Flow Length=106.7 m Slope=0.0050 m/m Tc=5.3 min CN=91 Runoff=11.6476 m³/s 24.529 Ml

Subcatchment 7S: Explosive Runoff Area=1.4423 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.9223 m³/s 2.042 Ml

Subcatchment 8S: Mining Laydown Runoff Area=1.2869 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.8229 m³/s 1.822 Ml

Subcatchment 9S: Effluent Treatment Runoff Area=0.4561 ha 72.00% Impervious Runoff Depth>126 mm
Tc=5.0 min CN=91 Runoff=0.2759 m³/s 0.574 Ml

Subcatchment 10S: Fuel Station Runoff Area=0.0494 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.0316 m³/s 0.070 Ml

Subcatchment 11S: Contractor Runoff Area=2.6114 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=1.6699 m³/s 3.697 Ml

Subcatchment 12S: Main Road (West) Runoff Area=1.5560 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.9950 m³/s 2.203 Ml

Subcatchment 13S: Portal Runoff Area=0.9591 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.6133 m³/s 1.358 Ml

Subcatchment 14S: Main Road (East) Runoff Area=2.3290 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=1.4893 m³/s 3.297 Ml

Subcatchment 15S: Explosive Runoff Area=0.0154 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.0098 m³/s 0.022 Ml

Subcatchment 16S: WWTP Roadway Runoff Area=0.2468 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.1578 m³/s 0.349 Ml

Subcatchment 17S: WWTP Roadway S Runoff Area=0.6295 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.4025 m³/s 0.891 Ml

Subcatchment 18S: WWTP Roadway E Runoff Area=0.2396 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.1532 m³/s 0.339 Ml

Subcatchment 19S: North Roadway Runoff Area=0.0080 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.0051 m³/s 0.011 Ml

Subcatchment 22S: Mining Laydown Runoff Area=0.3660 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=0.2340 m³/s 0.518 Ml

Subcatchment 23S: Slag Stockpile Runoff Area=4.5850 ha 100.00% Impervious Runoff Depth>142 mm
Tc=5.0 min CN=98 Runoff=2.9320 m³/s 6.491 Ml

Reach 1R: Proposed Contact Water Pipe Avg. Flow Depth=0.00 m Max Vel=0.00 m/s
914 mm Round Pipe n=0.012 L=754.40 m S=0.0095 m/m Capacity=1.9881 m³/s Outflow=0.0000 m³/s 0.000 Ml

Reach 2R: Proposed Contact Avg. Flow Depth=1.41 m Max Vel=5.62 m/s Inflow=12.7692 m³/s 37.154 Ml
1,829 mm Round Pipe n=0.012 L=1,160.00 m S=0.0100 m/m Capacity=12.9949 m³/s Outflow=12.1861 m³/s 37.001 Ml

Reach 3R: Overland Flow Avg. Flow Depth=1.30 m Max Vel=2.18 m/s Inflow=30.5959 m³/s 81.550 Ml
n=0.035 L=457.20 m S=0.0067 m/m Capacity=38.7640 m³/s Outflow=28.2111 m³/s 81.125 Ml

Reach 5R: Proposed Contact Avg. Flow Depth=0.38 m Max Vel=4.06 m/s Inflow=1.0607 m³/s 2.395 Ml
914 mm Round Pipe n=0.012 L=30.48 m S=0.0200 m/m Capacity=2.8910 m³/s Outflow=1.0506 m³/s 2.394 Ml

Reach 7R: Proposed Contact Avg. Flow Depth=0.28 m Max Vel=2.49 m/s Inflow=0.2759 m³/s 0.574 Ml
457 mm Round Pipe n=0.012 L=198.12 m S=0.0138 m/m Capacity=0.3787 m³/s Outflow=0.2576 m³/s 0.573 Ml

Reach 8R: Proposed Contact Avg. Flow Depth=0.45 m Max Vel=2.61 m/s Inflow=0.6149 m³/s 1.361 Ml
610 mm Round Pipe n=0.012 L=91.44 m S=0.0094 m/m Capacity=0.6746 m³/s Outflow=0.5867 m³/s 1.360 Ml

Reach 10R: Roadway & Ditches Avg. Flow Depth=0.04 m Max Vel=0.97 m/s Inflow=0.0098 m³/s 0.022 Ml
n=0.013 L=211.00 m S=0.0296 m/m Capacity=8.5571 m³/s Outflow=0.0087 m³/s 0.022 Ml

Reach 12R: Roadway & Ditches S Avg. Flow Depth=0.20 m Max Vel=1.58 m/s Inflow=0.4025 m³/s 0.891 Ml
n=0.013 L=607.00 m S=0.0099 m/m Capacity=4.9432 m³/s Outflow=0.3204 m³/s 0.885 Ml

Reach 17R: Non-Contact Bypass Avg. Flow Depth=0.16 m Max Vel=0.90 m/s Inflow=0.9469 m³/s 17.941 Ml
n=0.035 L=335.28 m S=0.0127 m/m Capacity=9.6183 m³/s Outflow=0.9465 m³/s 17.532 Ml

Reach 19R: Roadway & Ditches W Avg. Flow Depth=0.13 m Max Vel=1.78 m/s Inflow=0.1578 m³/s 0.349 Ml
n=0.013 L=175.00 m S=0.0229 m/m Capacity=7.5169 m³/s Outflow=0.1461 m³/s 0.349 Ml

Reach 20R: Roadway & Ditches E Avg. Flow Depth=0.13 m Max Vel=1.72 m/s Inflow=0.1532 m³/s 0.339 Ml
n=0.013 L=231.00 m S=0.0216 m/m Capacity=7.3149 m³/s Outflow=0.1395 m³/s 0.338 Ml

Reach 21R: WWTP Channel Avg. Flow Depth=0.39 m Max Vel=4.04 m/s Inflow=3.3353 m³/s 8.063 Ml
n=0.013 L=135.00 m S=0.0185 m/m Capacity=8.6984 m³/s Outflow=3.2093 m³/s 8.054 Ml

Reach 22R: North Roadway & Avg. Flow Depth=0.03 m Max Vel=0.93 m/s Inflow=0.0051 m³/s 0.011 Ml
n=0.013 L=77.00 m S=0.0390 m/m Capacity=9.8139 m³/s Outflow=0.0048 m³/s 0.011 Ml

Reach 23R: Roadway & Ditches Avg. Flow Depth=0.20 m Max Vel=1.01 m/s Inflow=0.2340 m³/s 0.518 Ml
n=0.013 L=353.00 m S=0.0042 m/m Capacity=3.2411 m³/s Outflow=0.1918 m³/s 0.515 Ml

Reach 26R: West Roadway & Avg. Flow Depth=0.26 m Max Vel=1.85 m/s Inflow=0.9950 m³/s 2.203 Ml
n=0.013 L=1,500.00 m S=0.0098 m/m Capacity=4.9304 m³/s Outflow=0.6109 m³/s 2.171 Ml

Reach 27R: East Roadway & Avg. Flow Depth=0.32 m Max Vel=1.97 m/s Inflow=1.4893 m³/s 3.297 Ml
n=0.013 L=1,240.00 m S=0.0091 m/m Capacity=4.7358 m³/s Outflow=0.7816 m³/s 3.261 Ml

Pond 1P: Existing Bedell/Future Peak Elev=248.777 m Storage=49.492 Ml Inflow=14.8809 m³/s 49.513 Ml
Outflow=0.0000 m³/s 0.000 Ml

Pond 2P: Proposed SE Contact Peak Elev=262.870 m Storage=3.320 Ml Inflow=17.0302 m³/s 35.864 Ml
Primary=12.2572 m³/s 35.795 Ml Secondary=0.0000 m³/s 0.000 Ml Outflow=12.2572 m³/s 35.795 Ml

Pond 3P: Non-Contact Ponds Peak Elev=251.977 m Storage=66.568 Ml Inflow=28.3645 m³/s 82.483 Ml
Outflow=0.9469 m³/s 17.941 Ml

Pond 11P: Sump 3 Inflow=0.9283 m³/s 2.064 Ml
Primary=0.9283 m³/s 2.064 Ml

Pond 24P: Sump 4 Inflow=0.0048 m³/s 0.011 Ml
Primary=0.0048 m³/s 0.011 Ml

Pond 26P: Sump 2 Inflow=1.3313 m³/s 6.028 Ml
Primary=1.3313 m³/s 6.028 Ml

Link 1L: Outfall (To Effluent TP) Inflow=0.0000 m³/s 0.000 Ml
Primary=0.0000 m³/s 0.000 Ml

Link 3L: Outfall (To Existing Overland Flow) Inflow=0.9465 m³/s 17.532 Ml
Primary=0.9465 m³/s 17.532 Ml

Link 4L: To Tailings Pond Inflow=6.7699 m³/s 19.731 Ml
Primary=6.7699 m³/s 19.731 Ml

Total Runoff Area = 114.9378 ha Runoff Volume = 152.465 Ml Average Runoff Depth = 133 mm
18.57% Pervious = 21.3384 ha 81.43% Impervious = 93.5994 ha

Summary for Subcatchment 1S: Process Plant

[49] Hint: Tc<2dt may require smaller dt

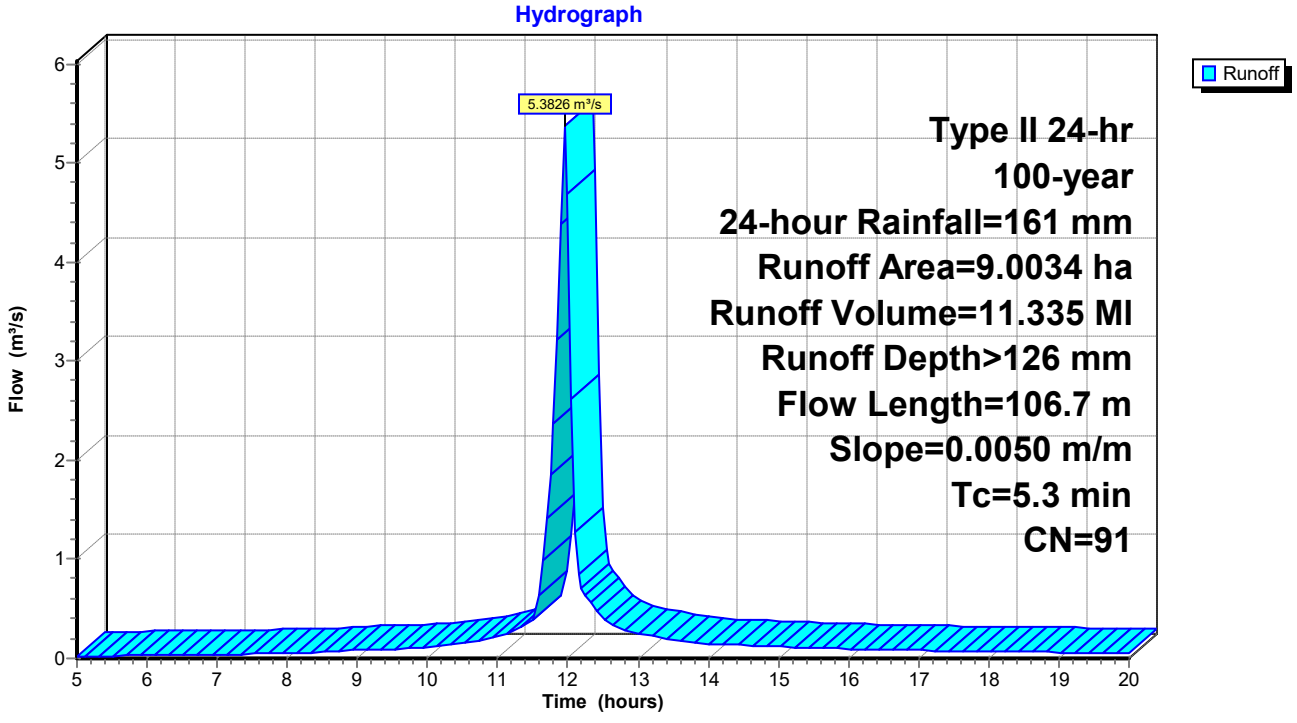
Runoff = 5.3826 m³/s @ 11.95 hrs, Volume= 11.335 Ml, Depth> 126 mm
Routed to Pond 2P : Proposed SE Contact Sump

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
9.0034	91	Urban industrial, 72% imp, HSG C
2.5210		28.00% Pervious Area
6.4825		72.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
2.4	30.5	0.0050	0.21		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 63 mm
2.9	76.2	0.0050	0.44		**Shallow Concentrated Flow,** Paved Kv= 6.19 m/s
5.3	106.7	Total			

Subcatchment 1S: Process Plant



Summary for Subcatchment 2S: West Non-Contact Watershed

[47] Hint: Peak is 1595% of capacity of segment #3

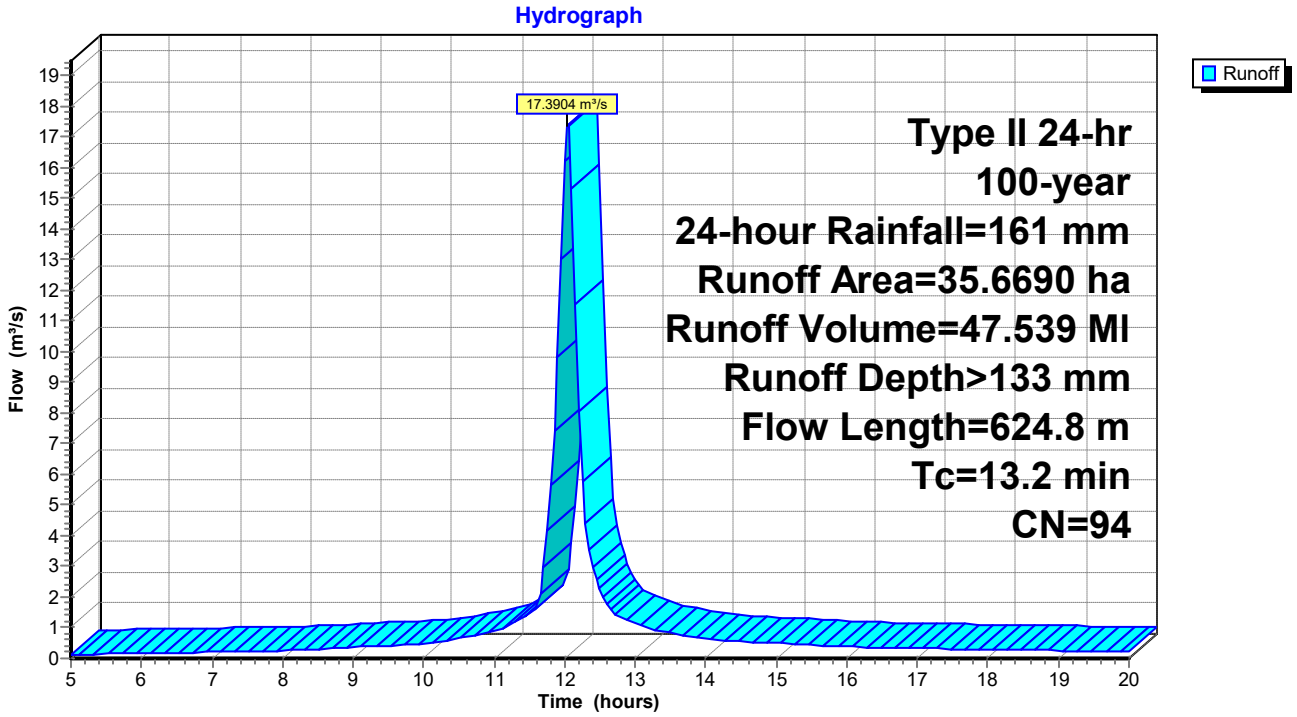
Runoff = 17.3904 m³/s @ 12.04 hrs, Volume= 47.539 Ml, Depth> 133 mm
Routed to Reach 3R : Overland Flow

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
22.0230	91	Urban industrial, 72% imp, HSG C
4.1804	98	Unconnected pavement, HSG C
9.4656	98	Paved parking, HSG C
35.6690	94	Weighted Average
6.1664		17.29% Pervious Area
29.5026		82.71% Impervious Area
4.1804		14.17% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
2.5	45.7	0.0100	0.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 63 mm
1.6	45.7	0.0100	0.49		**Shallow Concentrated Flow,** Unpaved Kv= 4.91 m/s
9.1	533.4	0.0080	0.98	1.0901	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00 m D=0.61 m Z= 3.0 m/m Top.W=3.66 m n= 0.040 Earth, cobble bottom, clean sides
13.2	624.8	Total			

Subcatchment 2S: West Non-Contact Watershed



Summary for Subcatchment 3S: Northeast Non-Contact Watershed

[47] Hint: Peak is 1267% of capacity of segment #3

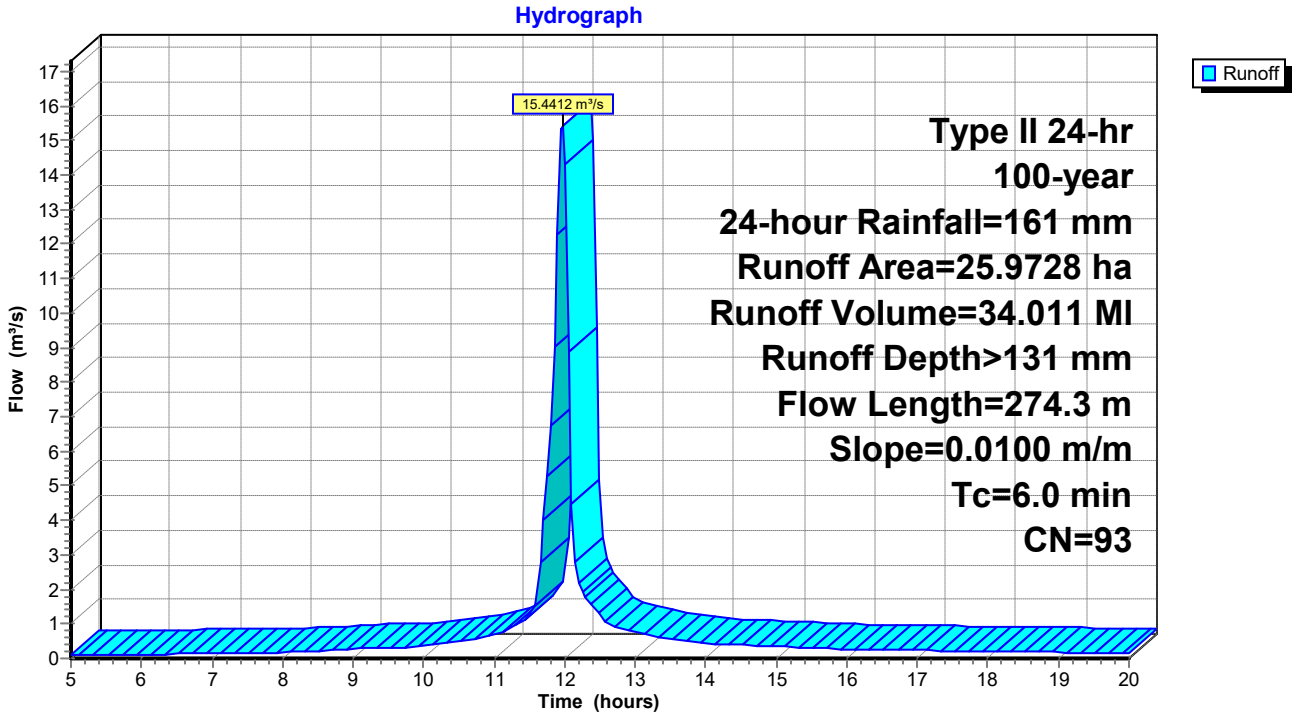
Runoff = 15.4412 m³/s @ 11.96 hrs, Volume= 34.011 Ml, Depth> 131 mm
Routed to Reach 3R : Overland Flow

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
19.7365	91	Urban industrial, 72% imp, HSG C
4.6944	98	Unconnected pavement, HSG C
1.5419	98	Water Surface, 0% imp, HSG C
25.9728	93	Weighted Average
7.0681		27.21% Pervious Area
18.9047		72.79% Impervious Area
4.6944		24.83% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
1.8	30.5	0.0100	0.28		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 63 mm
1.2	45.7	0.0100	0.62		**Shallow Concentrated Flow,** Paved Kv= 6.19 m/s
3.0	198.1	0.0100	1.09	1.2187	**Trap/Vee/Rect Channel Flow,** Bot.W=0.00 m D=0.61 m Z= 3.0 m/m Top.W=3.66 m n= 0.040 Earth, cobble bottom, clean sides
6.0	274.3	Total			

Subcatchment 3S: Northeast Non-Contact Watershed



Summary for Subcatchment 4S: Crushed Ore Stockpile

[49] Hint: Tc<2dt may require smaller dt

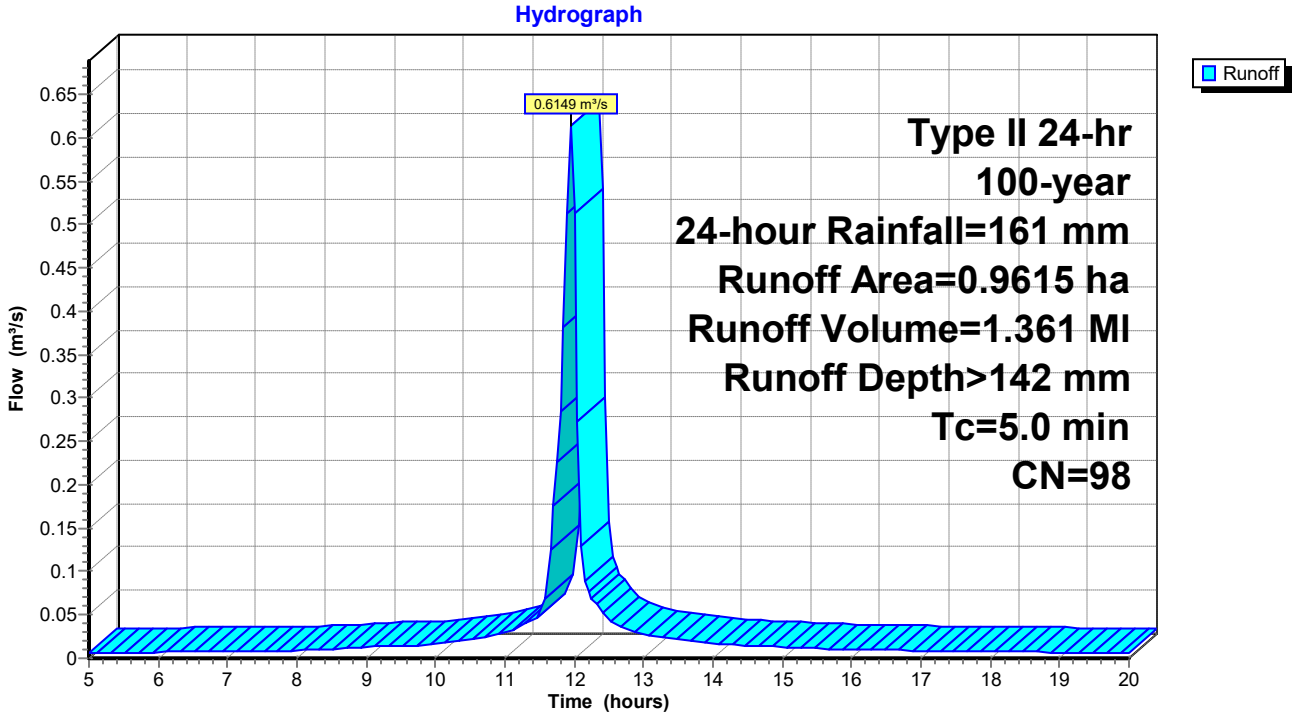
Runoff = 0.6149 m³/s @ 11.95 hrs, Volume= 1.361 Ml, Depth> 142 mm
Routed to Reach 8R : Proposed Contact Water Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.9615	98	Unconnected pavement, HSG C
0.9615		100.00% Impervious Area
0.9615		100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 4S: Crushed Ore Stockpile



Summary for Subcatchment 5S: Temporary Ore Stockpile

[49] Hint: Tc<2dt may require smaller dt

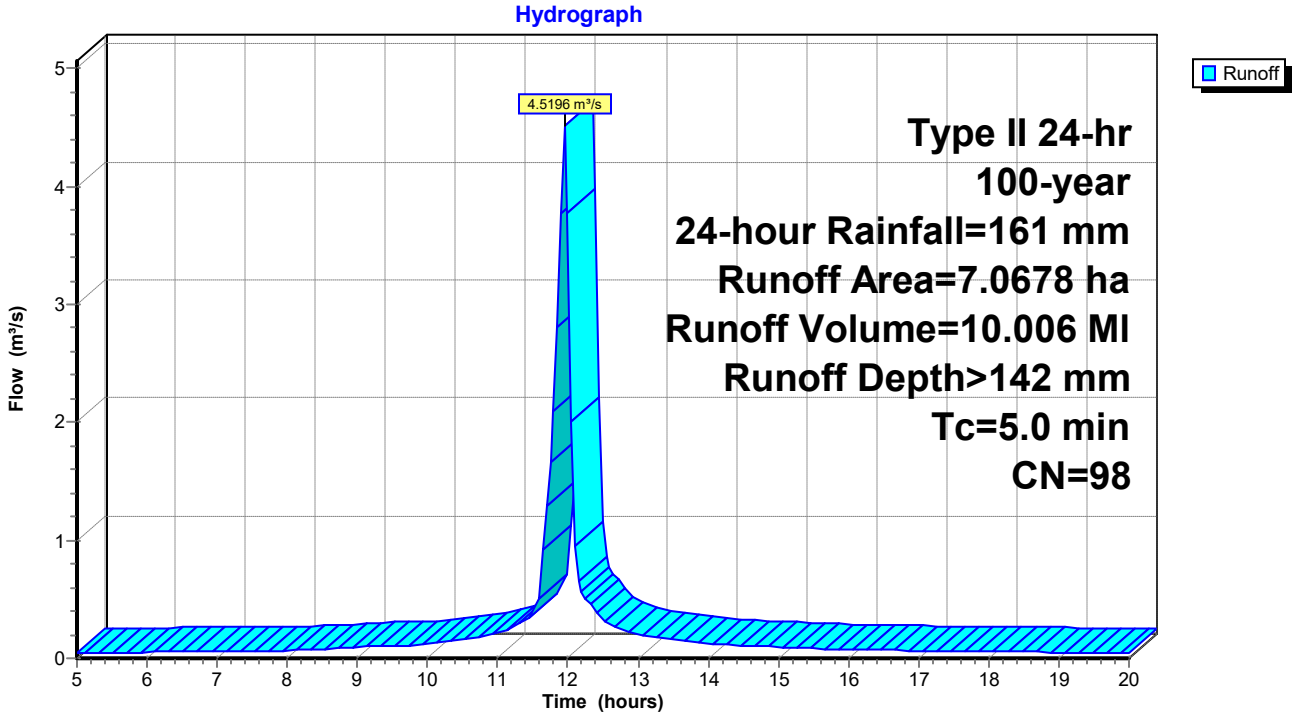
Runoff = 4.5196 m³/s @ 11.95 hrs, Volume= 10.006 Ml, Depth> 142 mm
Routed to Link 4L : To Tailings Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
7.0678	98	Unconnected pavement, HSG C
7.0678		100.00% Impervious Area
7.0678		100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 5S: Temporary Ore Stockpile



Summary for Subcatchment 6S: Southeast Non-Contact Watershed

[49] Hint: Tc<2dt may require smaller dt

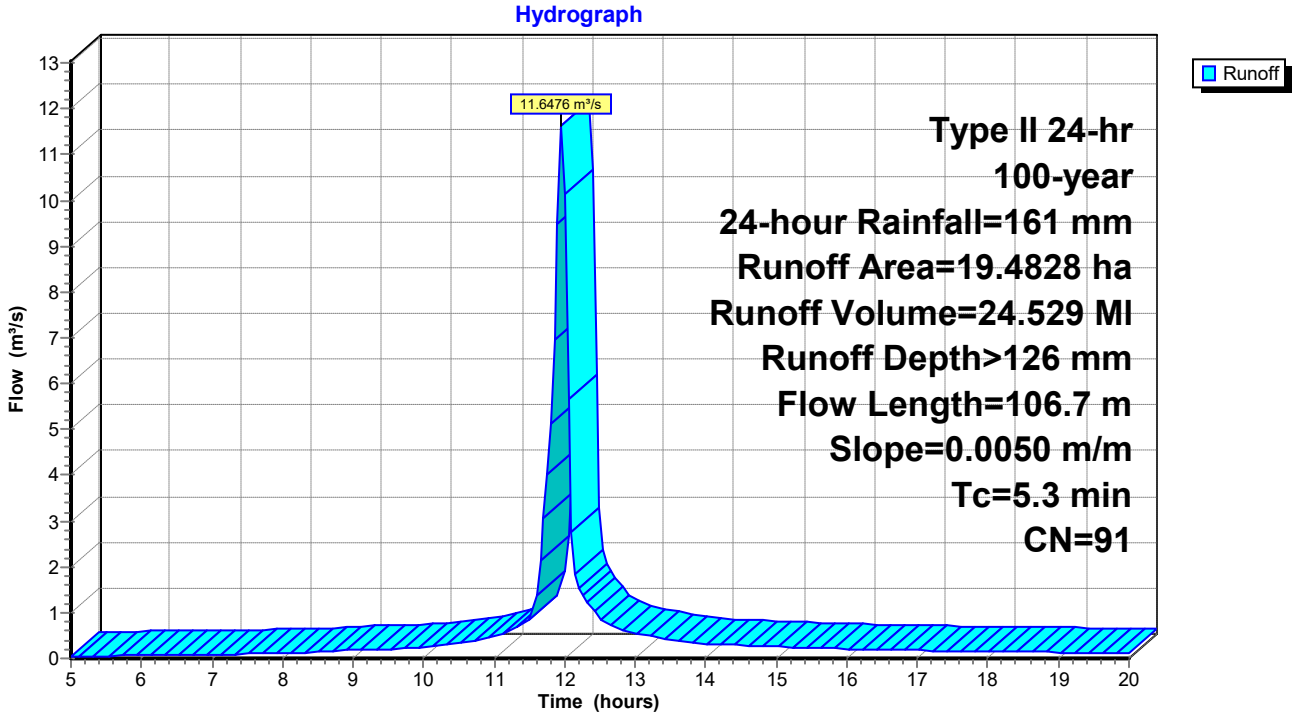
Runoff = 11.6476 m³/s @ 11.95 hrs, Volume= 24.529 Ml, Depth> 126 mm
Routed to Pond 2P : Proposed SE Contact Sump

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
19.4828	91	Urban industrial, 72% imp, HSG C
5.4552		28.00% Pervious Area
14.0276		72.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
2.4	30.5	0.0050	0.21		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 63 mm
2.9	76.2	0.0050	0.44		**Shallow Concentrated Flow,** Paved Kv= 6.19 m/s
5.3	106.7	Total			

Subcatchment 6S: Southeast Non-Contact Watershed



Summary for Subcatchment 7S: Explosive Magazine/Emulsion Silos

[49] Hint: Tc<2dt may require smaller dt

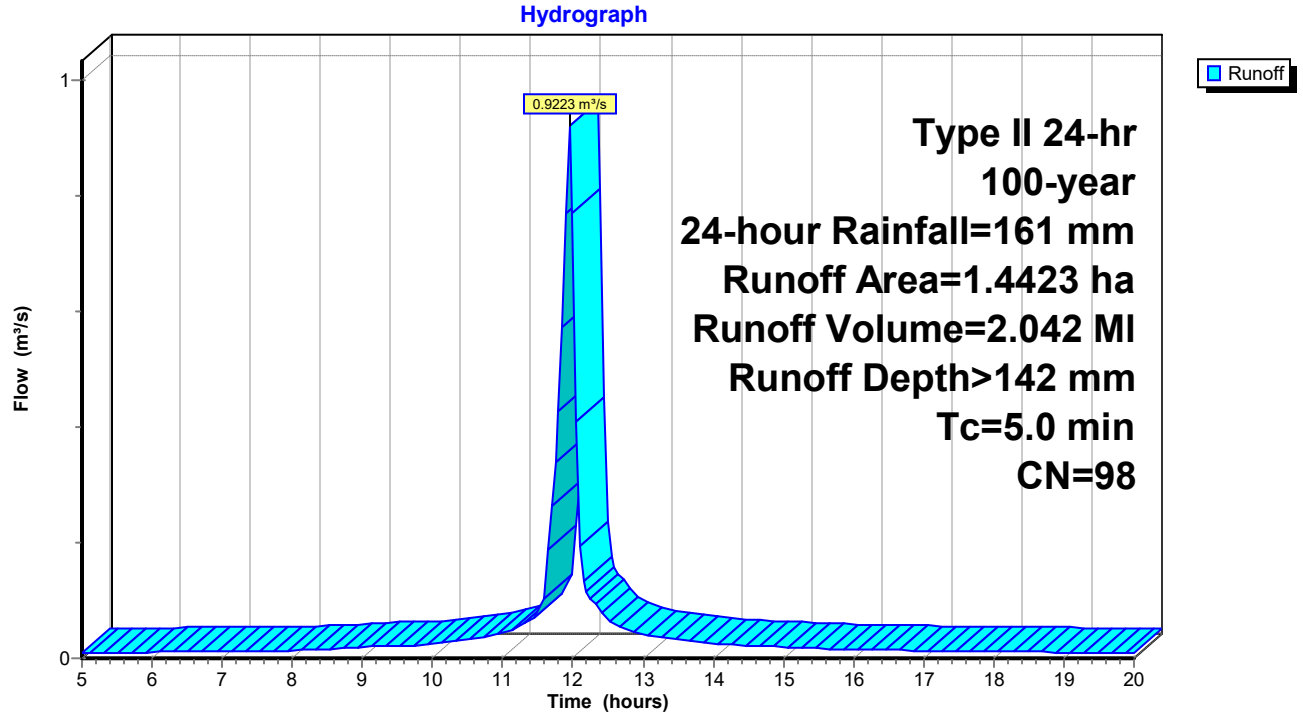
Runoff = 0.9223 m³/s @ 11.95 hrs, Volume= 2.042 Ml, Depth> 142 mm
Routed to Pond 11P : Sump 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
1.4423	98	Unconnected pavement, HSG C
1.4423		100.00% Impervious Area
1.4423		100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 7S: Explosive Magazine/Emulsion Silos



Summary for Subcatchment 8S: Mining Laydown Area

[49] Hint: Tc<2dt may require smaller dt

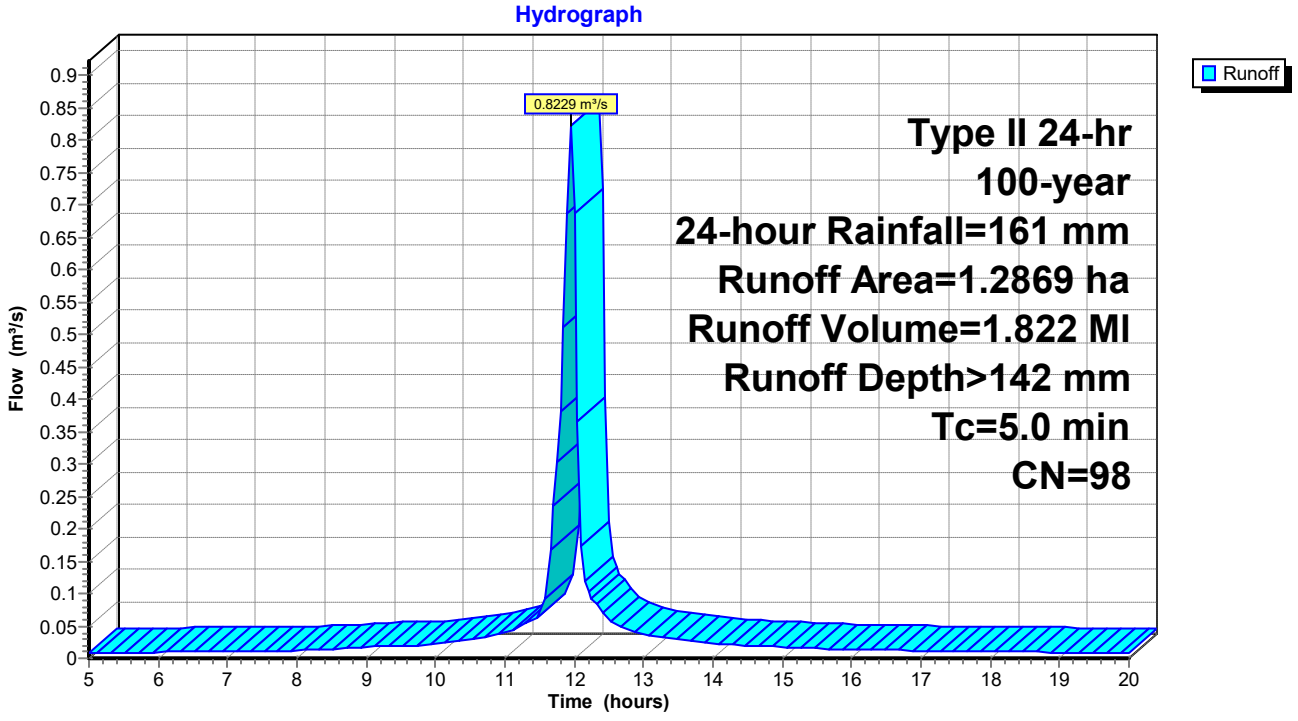
Runoff = 0.8229 m³/s @ 11.95 hrs, Volume= 1.822 Ml, Depth> 142 mm
Routed to Reach 5R : Proposed Contact Water Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
1.2869	98	Unconnected pavement, HSG C
1.2869		100.00% Impervious Area
1.2869		100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 8S: Mining Laydown Area



Summary for Subcatchment 9S: Effluent Treatment Plant

[49] Hint: Tc<2dt may require smaller dt

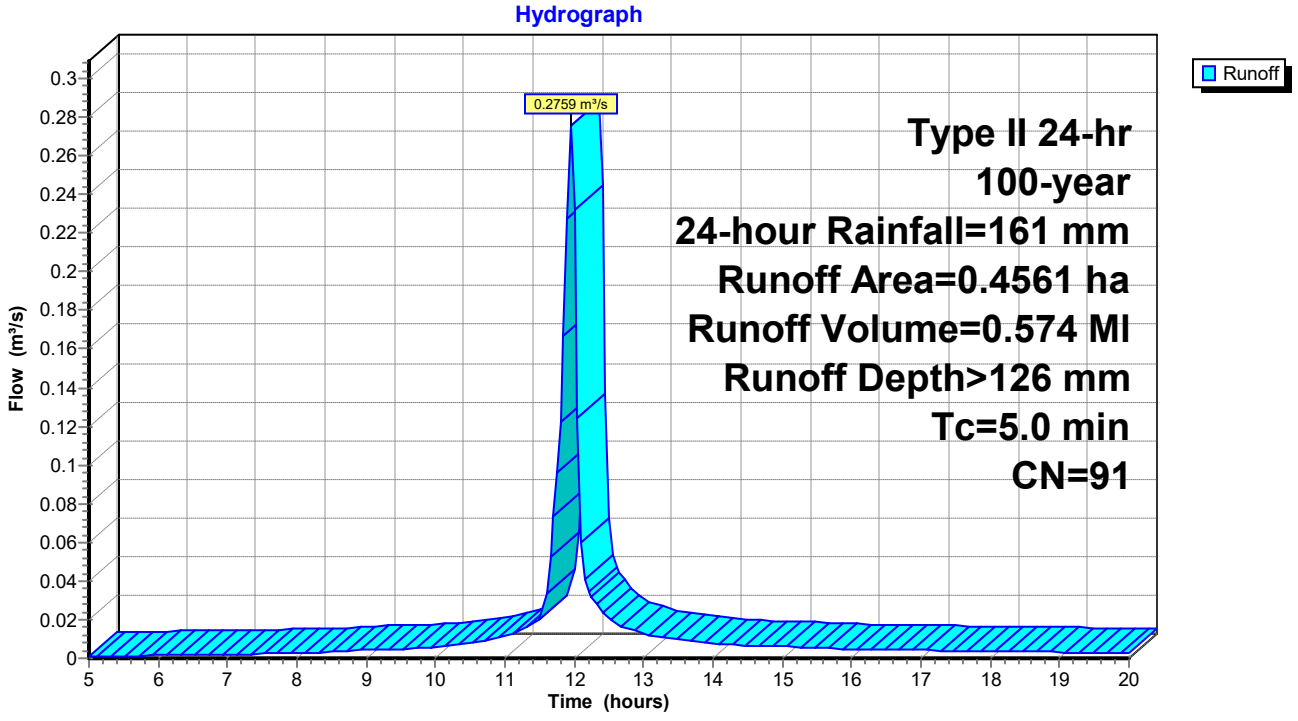
Runoff = 0.2759 m³/s @ 11.95 hrs, Volume= 0.574 Ml, Depth> 126 mm
Routed to Reach 7R : Proposed Contact Water Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.4561	91	Urban industrial, 72% imp, HSG C
0.1277		28.00% Pervious Area
0.3284		72.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 9S: Effluent Treatment Plant



Summary for Subcatchment 10S: Fuel Station

[49] Hint: Tc<2dt may require smaller dt

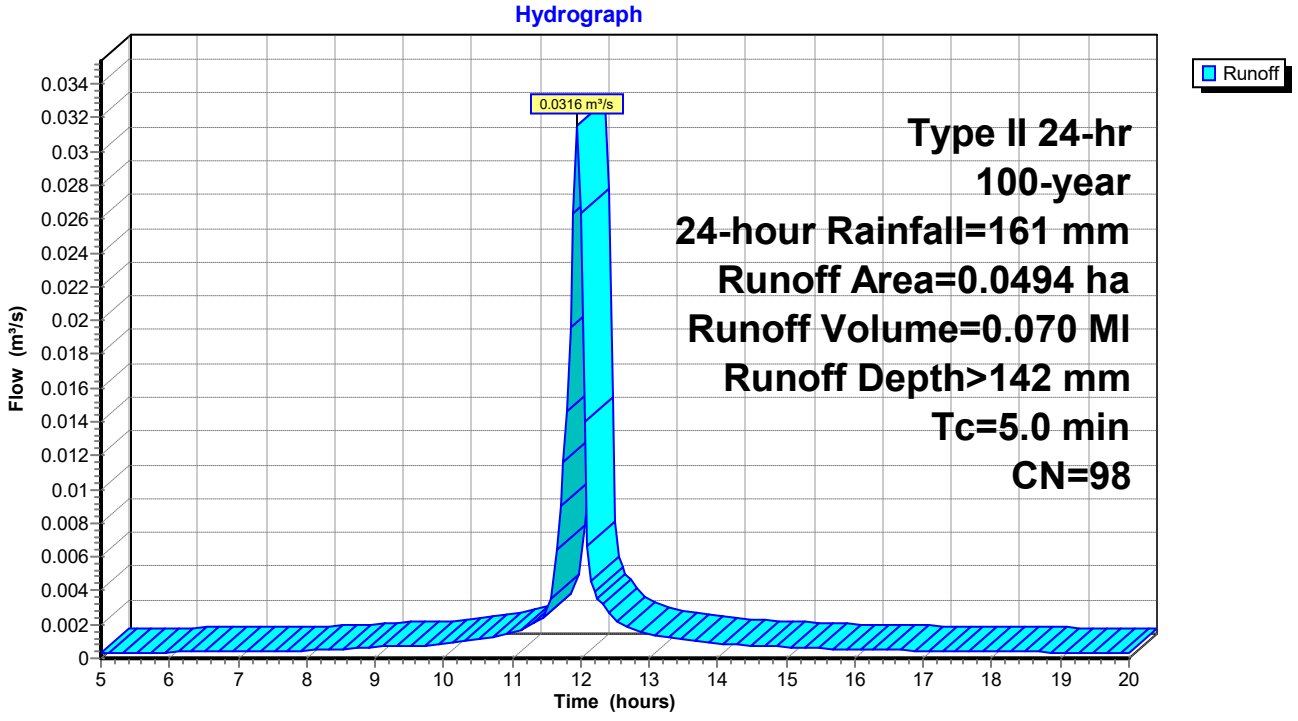
Runoff = 0.0316 m³/s @ 11.95 hrs, Volume= 0.070 Ml, Depth> 142 mm
Routed to Pond 26P : Sump 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.0494	98	Unconnected pavement, HSG C
0.0494		100.00% Impervious Area
0.0494		100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 10S: Fuel Station



Summary for Subcatchment 11S: Contractor Facilities/Shotcrete Plant

[49] Hint: Tc<2dt may require smaller dt

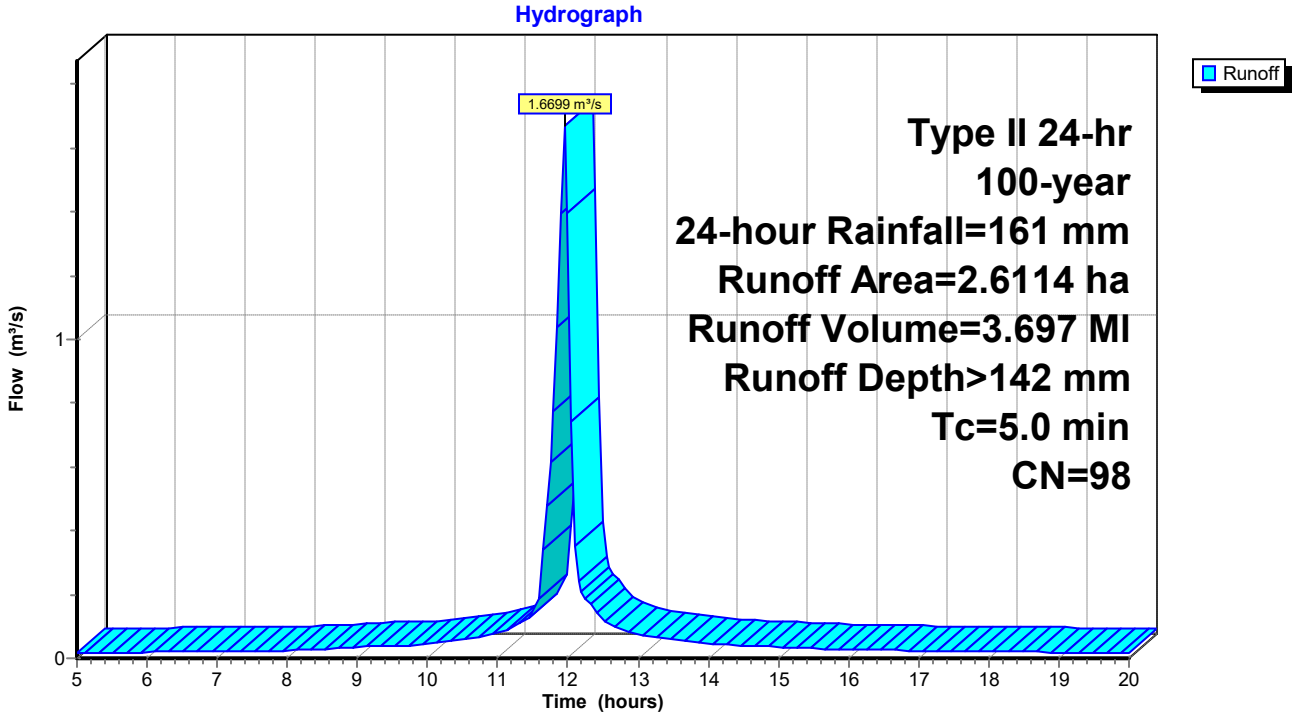
Runoff = 1.6699 m³/s @ 11.95 hrs, Volume= 3.697 Ml, Depth> 142 mm
Routed to Link 4L : To Tailings Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
2.6114	98	Unconnected pavement, HSG C
2.6114		100.00% Impervious Area
2.6114		100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 11S: Contractor Facilities/Shotcrete Plant



Summary for Subcatchment 12S: Main Road (West)

[49] Hint: Tc<2dt may require smaller dt

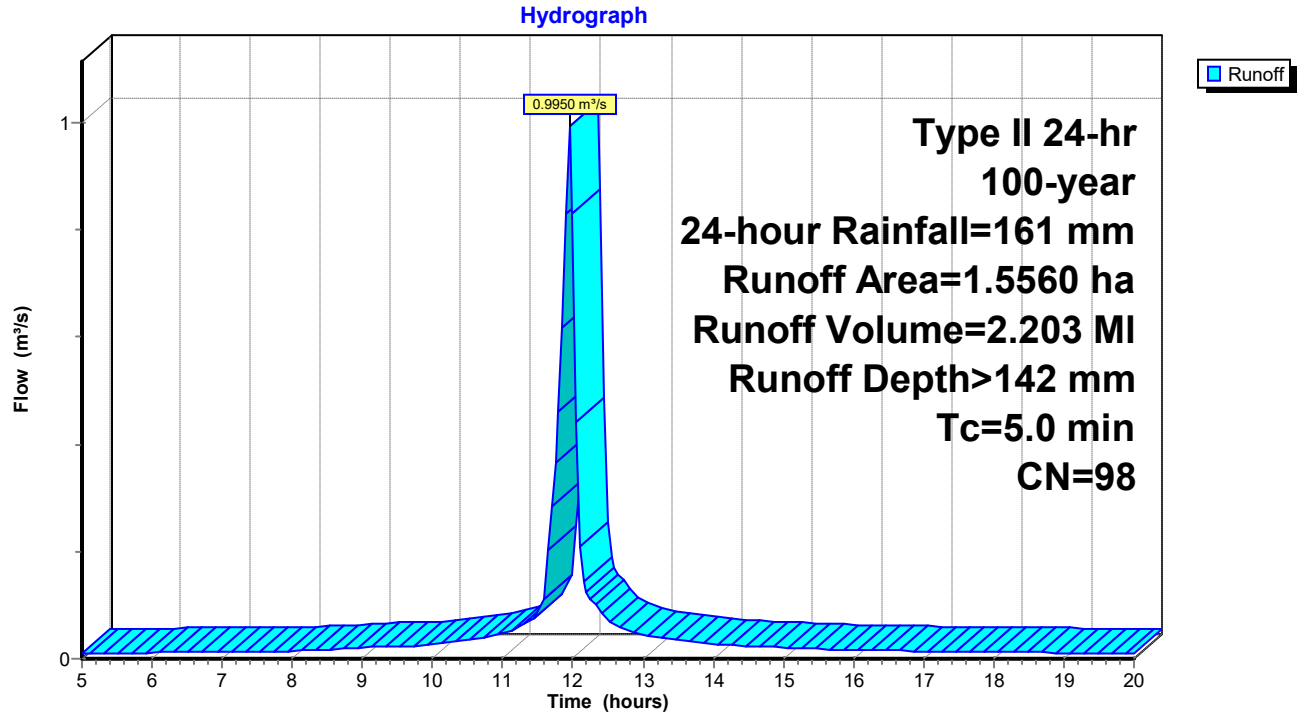
Runoff = 0.9950 m³/s @ 11.95 hrs, Volume= 2.203 Ml, Depth> 142 mm
Routed to Reach 26R : West Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
1.5560	98	Paved roads w/curbs & sewers, HSG C
1.5560		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 12S: Main Road (West)



Summary for Subcatchment 13S: Portal

[49] Hint: Tc<2dt may require smaller dt

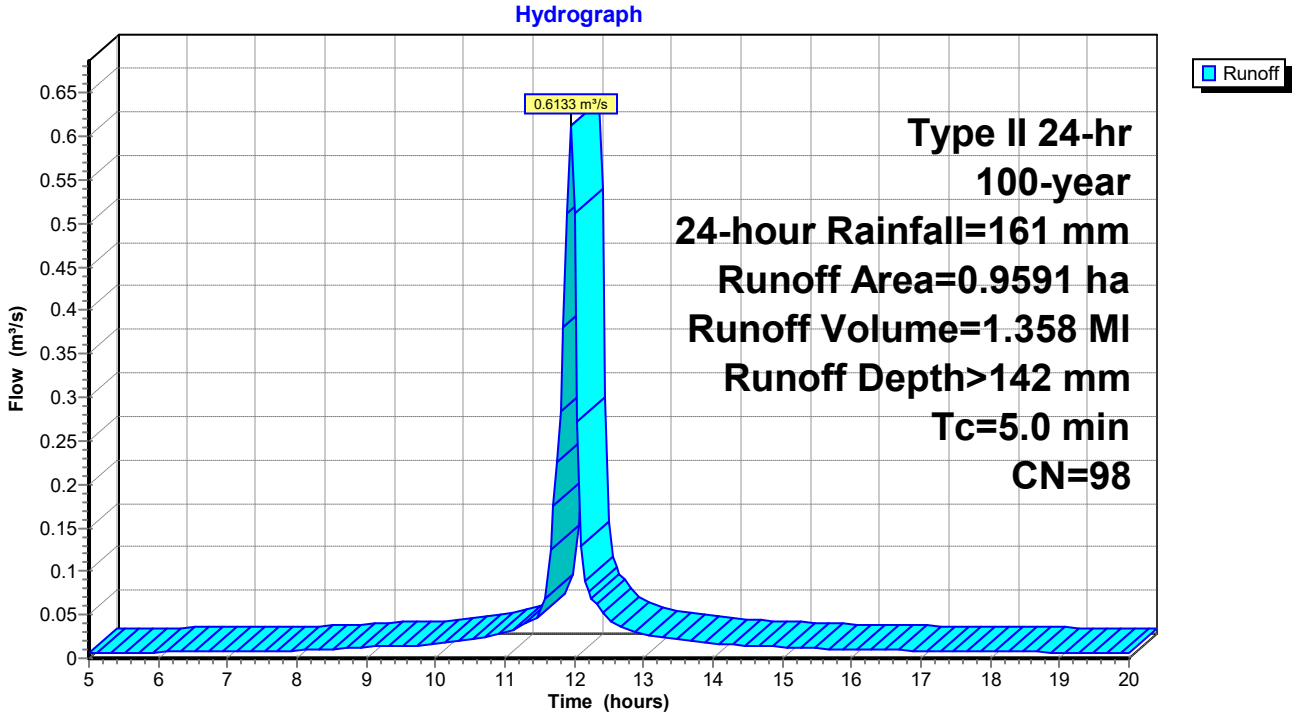
Runoff = 0.6133 m³/s @ 11.95 hrs, Volume= 1.358 Ml, Depth> 142 mm
Routed to Pond 3P : Non-Contact Ponds

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.9591	98	Unconnected pavement, HSG C
0.9591		100.00% Impervious Area
0.9591		100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 13S: Portal



Summary for Subcatchment 14S: Main Road (East)

[49] Hint: Tc<2dt may require smaller dt

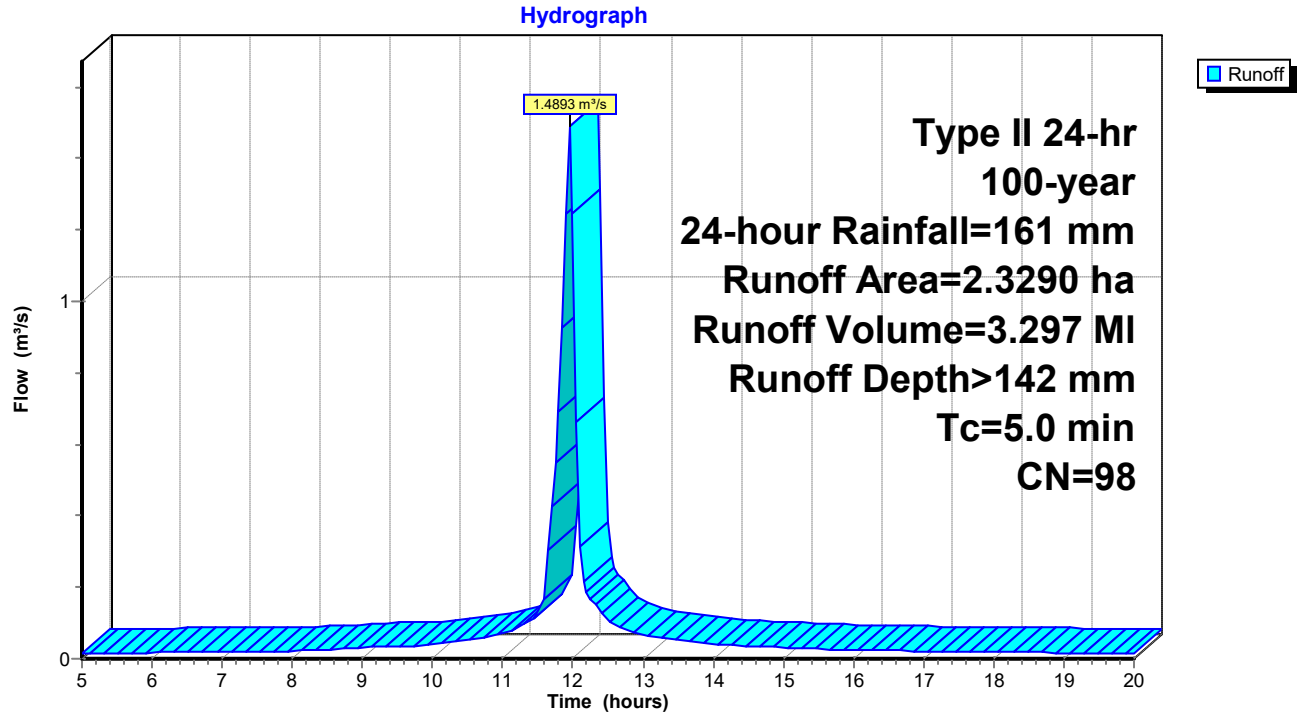
Runoff = 1.4893 m³/s @ 11.95 hrs, Volume= 3.297 Ml, Depth> 142 mm
Routed to Reach 27R : East Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
2.3290	98	Paved roads w/curbs & sewers, HSG C
2.3290		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 14S: Main Road (East)



Summary for Subcatchment 15S: Explosive Magazine Roadway

[49] Hint: Tc<2dt may require smaller dt

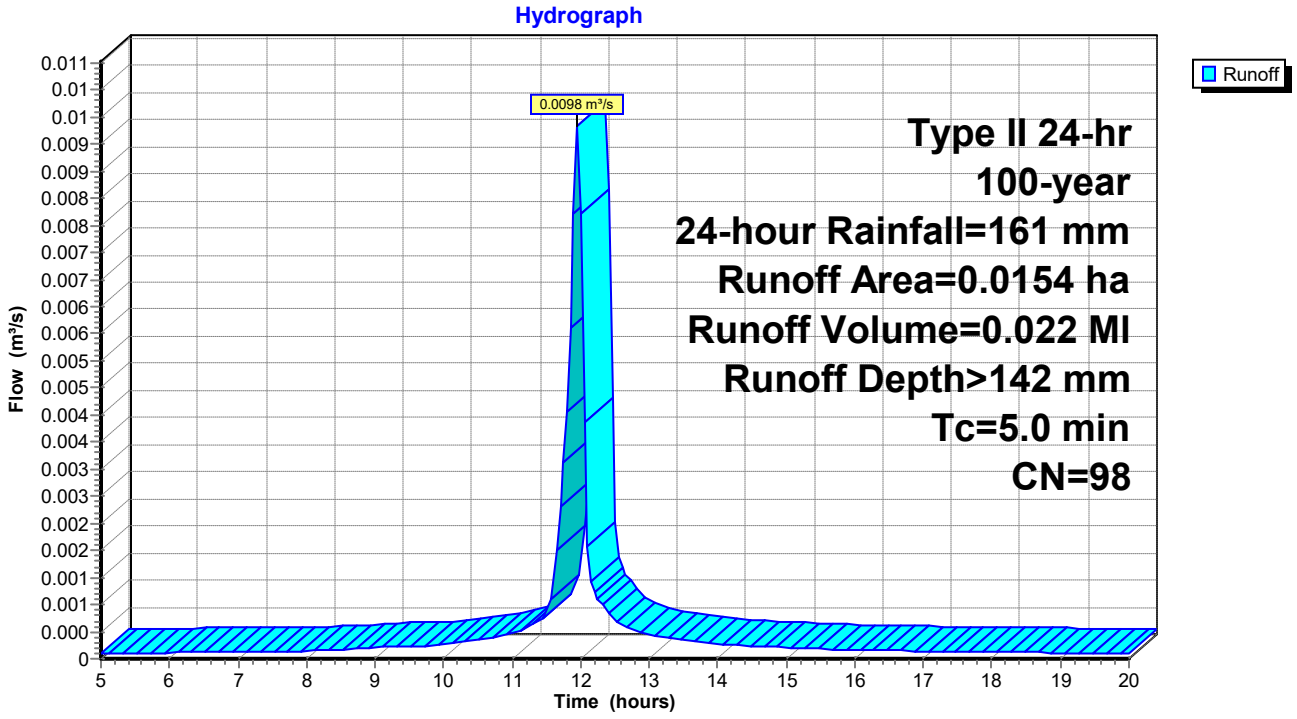
Runoff = 0.0098 m³/s @ 11.95 hrs, Volume= 0.022 Ml, Depth> 142 mm
Routed to Reach 10R : Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.0154	98	Paved roads w/curbs & sewers, HSG C
0.0154		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 15S: Explosive Magazine Roadway



Summary for Subcatchment 16S: WWTP Roadway W

[49] Hint: Tc<2dt may require smaller dt

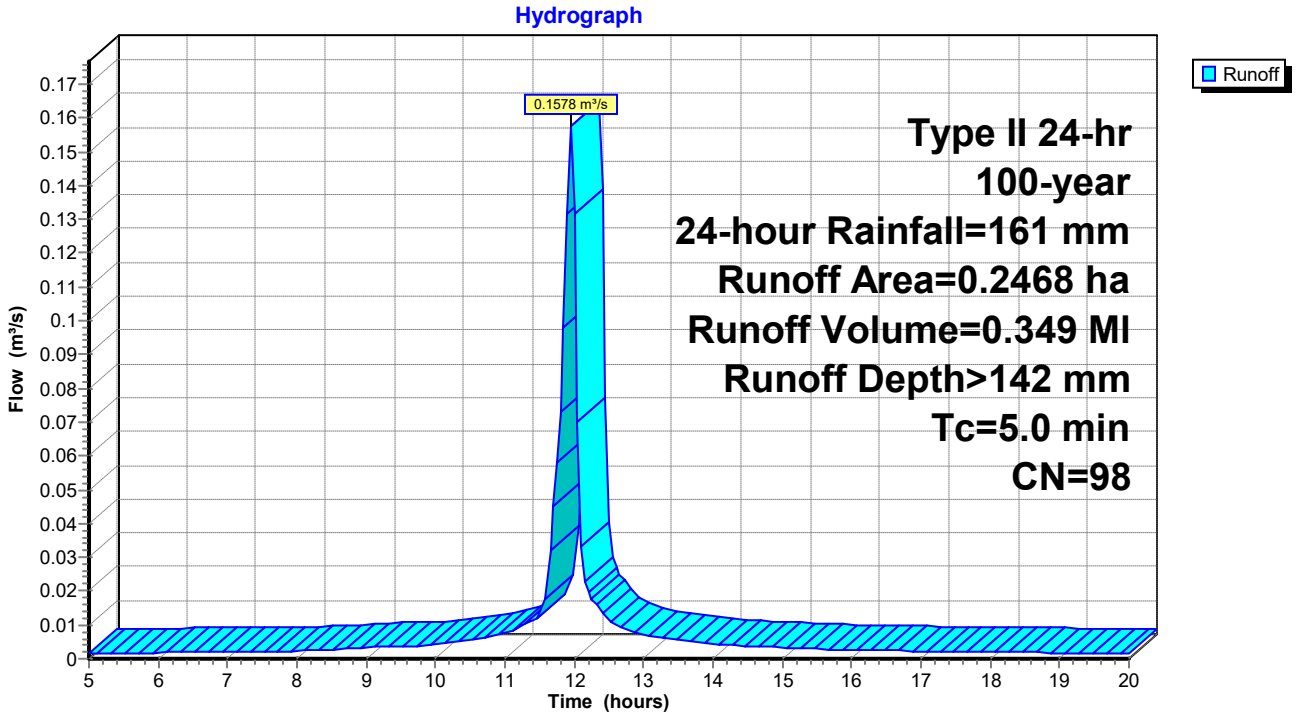
Runoff = 0.1578 m³/s @ 11.95 hrs, Volume= 0.349 Ml, Depth> 142 mm
Routed to Reach 19R : Roadway & Ditches W

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.2468	98	Paved roads w/curbs & sewers, HSG C
0.2468		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 16S: WWTP Roadway W



Summary for Subcatchment 17S: WWTP Roadway S

[49] Hint: Tc<2dt may require smaller dt

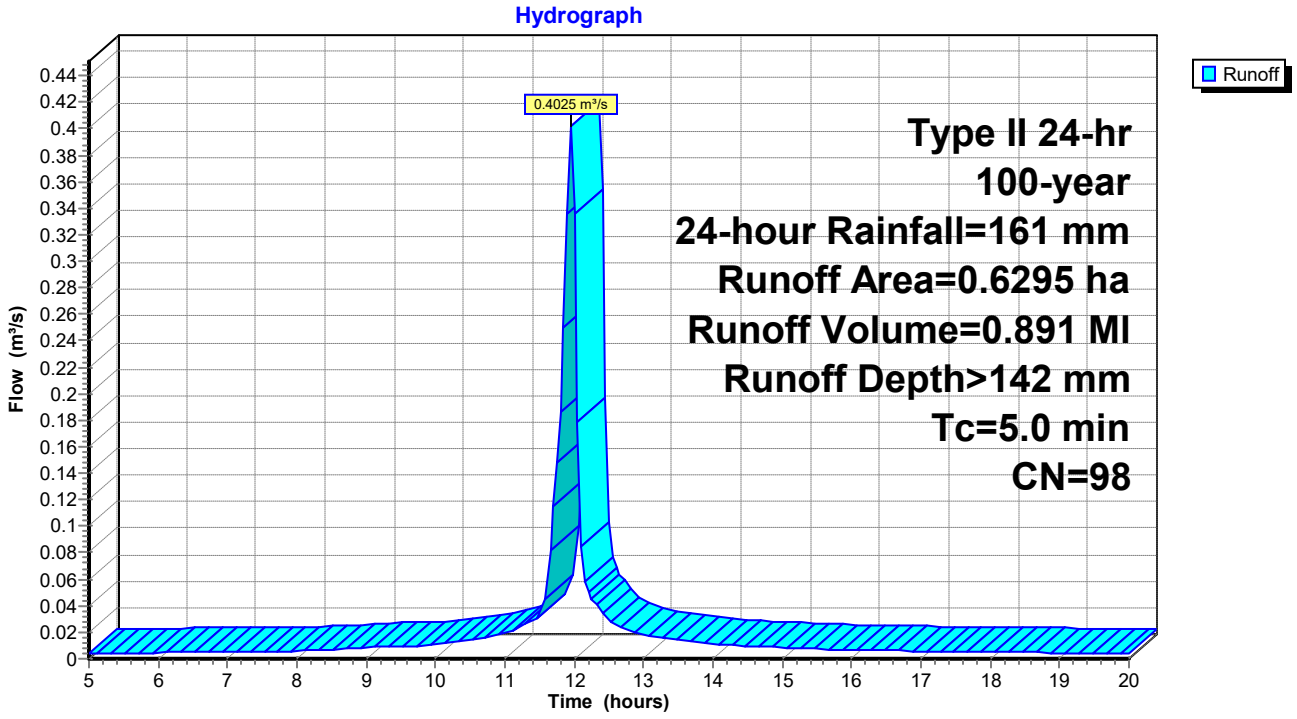
Runoff = 0.4025 m³/s @ 11.95 hrs, Volume= 0.891 Ml, Depth> 142 mm
Routed to Reach 12R : Roadway & Ditches S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.6295	98	Paved roads w/curbs & sewers, HSG C
0.6295		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 17S: WWTP Roadway S



Summary for Subcatchment 18S: WWTP Roadway E

[49] Hint: Tc<2dt may require smaller dt

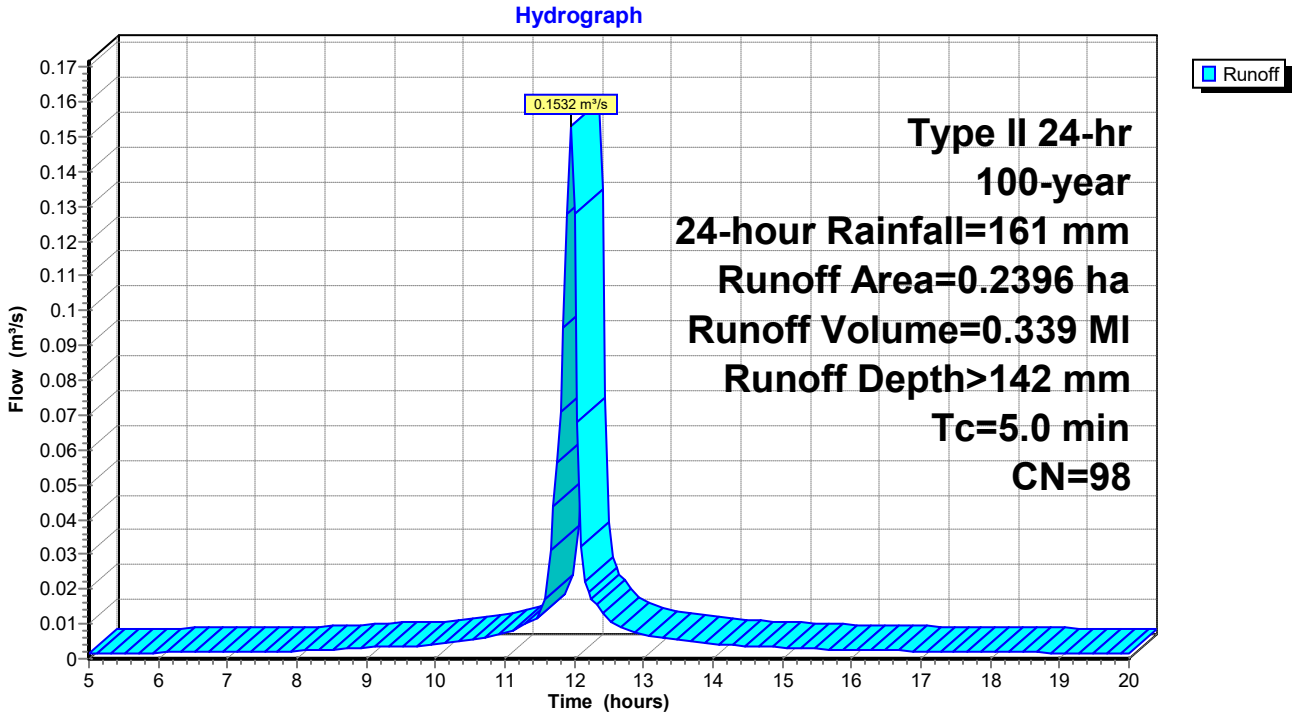
Runoff = 0.1532 m³/s @ 11.95 hrs, Volume= 0.339 Ml, Depth> 142 mm
Routed to Reach 20R : Roadway & Ditches E

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.2396	98	Paved roads w/curbs & sewers, HSG C
0.2396		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 18S: WWTP Roadway E



Summary for Subcatchment 19S: North Roadway

[49] Hint: Tc<2dt may require smaller dt

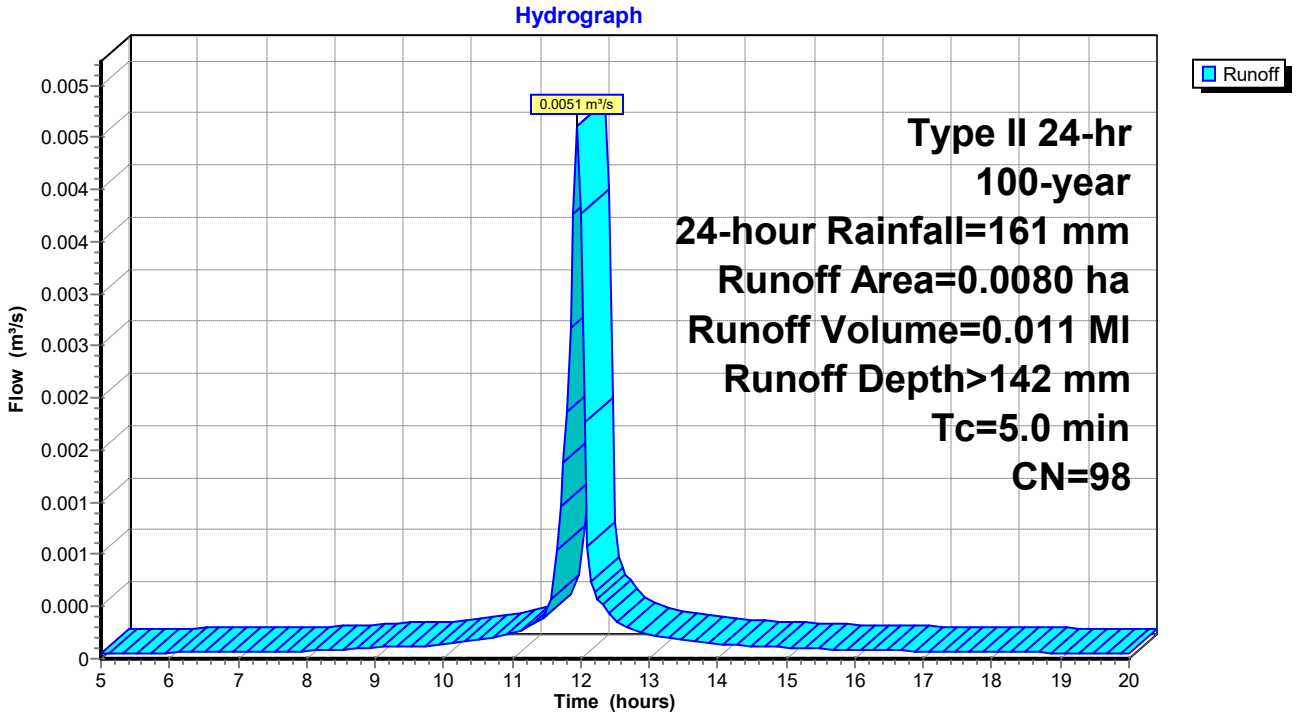
Runoff = 0.0051 m³/s @ 11.95 hrs, Volume= 0.011 Ml, Depth> 142 mm
Routed to Reach 22R : North Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.0080	98	Paved roads w/curbs & sewers, HSG C
0.0080		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 19S: North Roadway



Summary for Subcatchment 22S: Mining Laydown Roadway

[49] Hint: Tc<2dt may require smaller dt

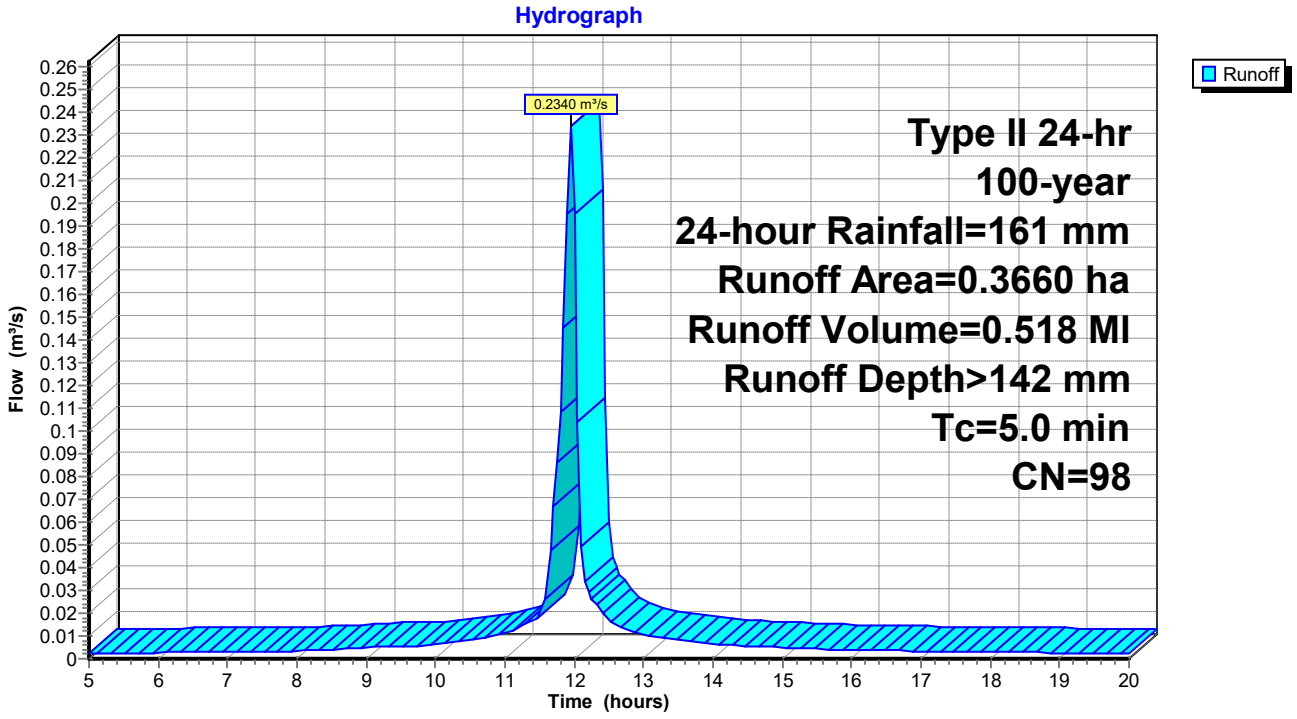
Runoff = 0.2340 m³/s @ 11.95 hrs, Volume= 0.518 Ml, Depth> 142 mm
Routed to Reach 23R : Roadway & Ditches

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
0.3660	98	Paved roads w/curbs & sewers, HSG C
0.3660		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 22S: Mining Laydown Roadway



Summary for Subcatchment 23S: Slag Stockpile

[49] Hint: Tc<2dt may require smaller dt

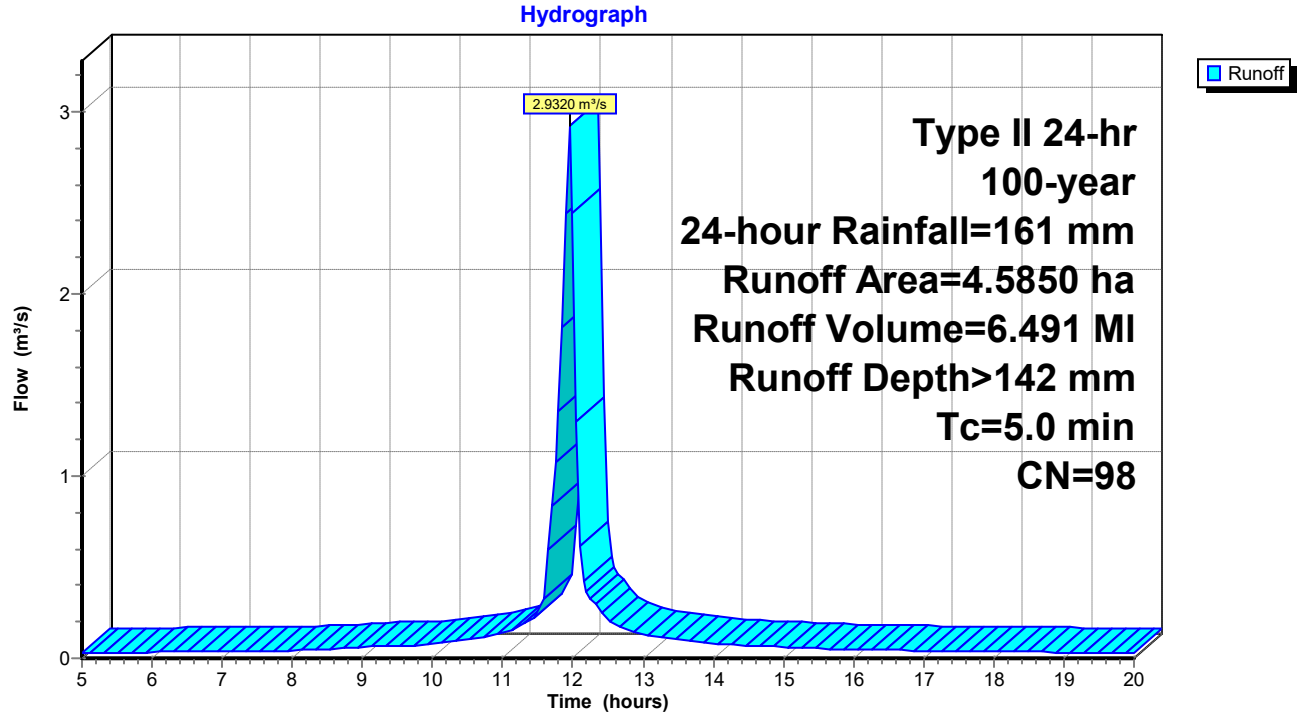
Runoff = 2.9320 m³/s @ 11.95 hrs, Volume= 6.491 Ml, Depth> 142 mm
Routed to Reach 21R : WWTP Channel

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year, 24-hour Rainfall=161 mm

Area (ha)	CN	Description
4.5850	98	Unconnected pavement, HSG C
4.5850		100.00% Impervious Area
4.5850		100.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
5.0					**Direct Entry,**

Subcatchment 23S: Slag Stockpile

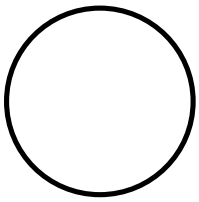


Summary for Reach 1R: Proposed Contact Water Pipe

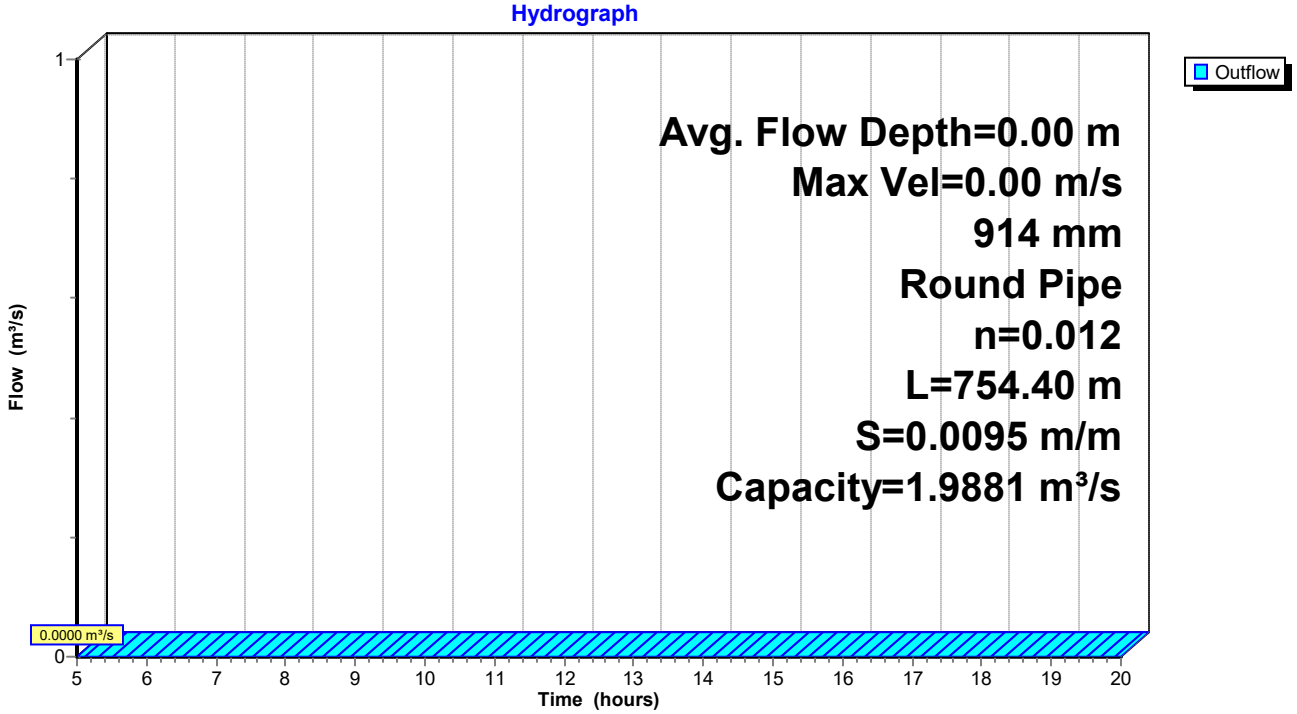
[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 0.91 m Flow Area= 0.66 m², Capacity= 1.9881 m³/s

914 mm Round Pipe
n= 0.012 Concrete pipe, finished
Length= 754.40 m Slope= 0.0095 m/m
Inlet Invert= 255.500 m, Outlet Invert= 248.360 m



Reach 1R: Proposed Contact Water Pipe



Summary for Reach 2R: Proposed Contact Water Pipe

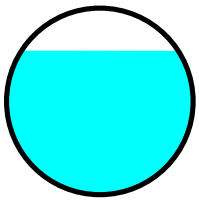
[52] Hint: Inlet/Outlet conditions not evaluated
[63] Warning: Exceeded Reach 8R INLET depth by 0.320 m @ 12.10 hrs
[79] Warning: Submerged Pond 2P Primary device # 1 INLET by 0.412 m

Inflow Area = 29.4478 ha, 72.91% Impervious, Inflow Depth > 126 mm for 100-year, 24-hour event
Inflow = 12.7692 m³/s @ 12.01 hrs, Volume= 37.154 Ml
Outflow = 12.1861 m³/s @ 12.11 hrs, Volume= 37.001 Ml, Atten= 5%, Lag= 6.1 min
Routed to Pond 1P : Existing Bedell/Future Contact Pond

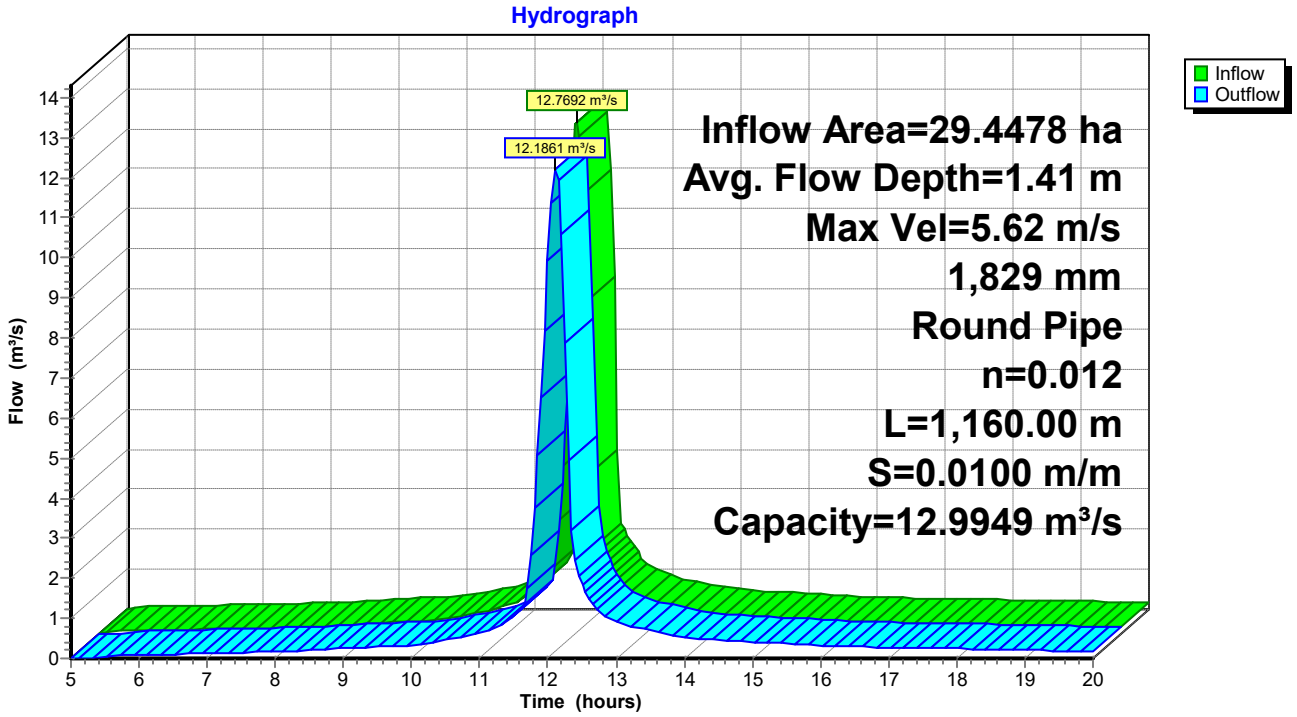
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.62 m/s, Min. Travel Time= 3.4 min
Avg. Velocity = 2.17 m/s, Avg. Travel Time= 8.9 min

Peak Storage= 2,526.5 m³ @ 12.06 hrs
Average Depth at Peak Storage= 1.41 m , Surface Width= 1.53 m
Bank-Full Depth= 1.83 m Flow Area= 2.63 m², Capacity= 12.9949 m³/s

1,829 mm Round Pipe
n= 0.012 Concrete pipe, finished
Length= 1,160.00 m Slope= 0.0100 m/m
Inlet Invert= 257.000 m, Outlet Invert= 245.400 m



Reach 2R: Proposed Contact Water Pipe



Summary for Reach 3R: Overland Flow

[82] Warning: Early inflow requires earlier time span

Inflow Area = 61.6418 ha, 78.53% Impervious, Inflow Depth > 132 mm for 100-year, 24-hour event
Inflow = 30.5959 m³/s @ 11.99 hrs, Volume= 81.550 Ml
Outflow = 28.2111 m³/s @ 12.09 hrs, Volume= 81.125 Ml, Atten= 8%, Lag= 5.8 min
Routed to Pond 3P : Non-Contact Ponds

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.18 m/s, Min. Travel Time= 3.5 min
Avg. Velocity = 0.71 m/s, Avg. Travel Time= 10.8 min

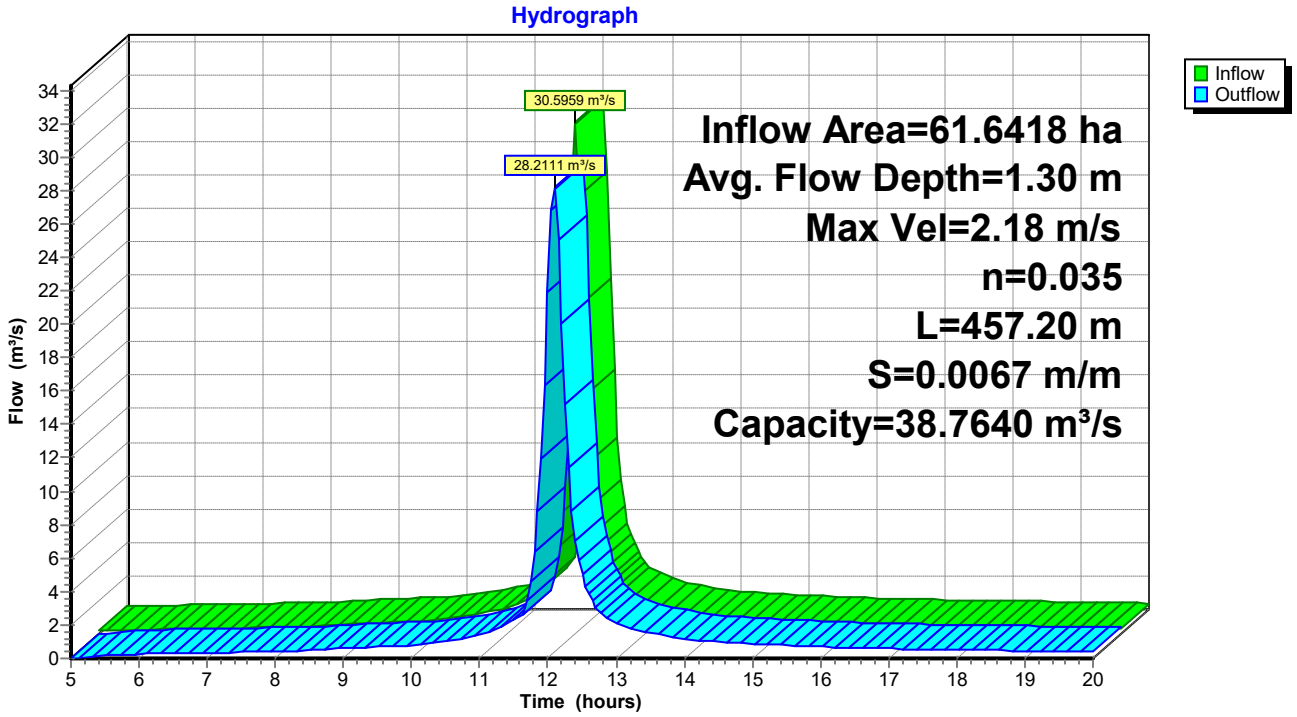
Peak Storage= 5,956.3 m³ @ 12.03 hrs
Average Depth at Peak Storage= 1.30 m , Surface Width= 13.91 m
Bank-Full Depth= 1.52 m Flow Area= 16.26 m², Capacity= 38.7640 m³/s

6.10 m x 1.52 m deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 m/m Top Width= 15.24 m
Length= 457.20 m Slope= 0.0067 m/m
Inlet Invert= 256.642 m, Outlet Invert= 253.594 m



‡

Reach 3R: Overland Flow



Summary for Reach 5R: Proposed Contact Water Pipe

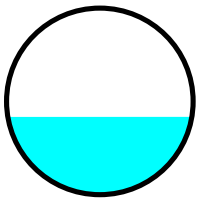
[52] Hint: Inlet/Outlet conditions not evaluated
[82] Warning: Early inflow requires earlier time span
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.104 m @ 11.95 hrs

Inflow Area = 1.7430 ha, 92.67% Impervious, Inflow Depth > 137 mm for 100-year, 24-hour event
Inflow = 1.0607 m³/s @ 11.96 hrs, Volume= 2.395 Ml
Outflow = 1.0506 m³/s @ 11.96 hrs, Volume= 2.394 Ml, Atten= 1%, Lag= 0.2 min
Routed to Pond 1P : Existing Bedell/Future Contact Pond

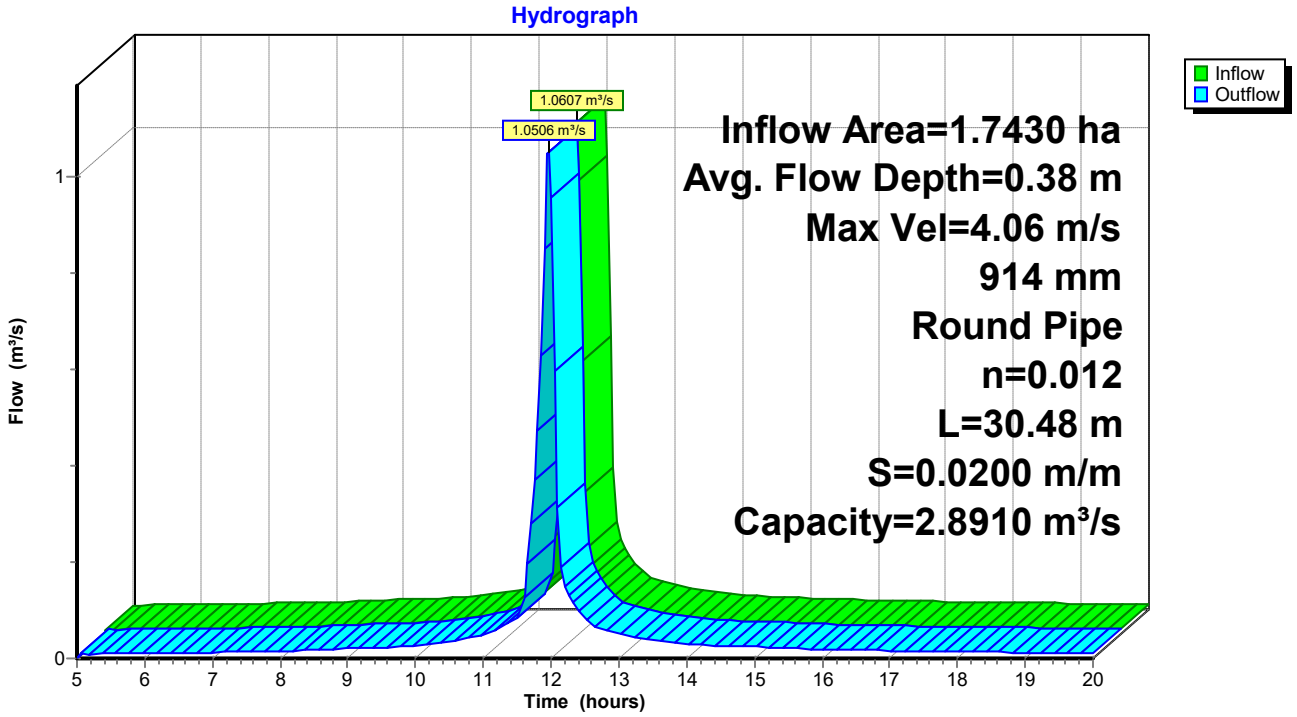
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.06 m/s, Min. Travel Time= 0.1 min
Avg. Velocity = 1.37 m/s, Avg. Travel Time= 0.4 min

Peak Storage= 7.9 m³ @ 11.96 hrs
Average Depth at Peak Storage= 0.38 m , Surface Width= 0.90 m
Bank-Full Depth= 0.91 m Flow Area= 0.66 m², Capacity= 2.8910 m³/s

914 mm Round Pipe
n= 0.012 Concrete pipe, finished
Length= 30.48 m Slope= 0.0200 m/m
Inlet Invert= 249.022 m, Outlet Invert= 248.412 m



Reach 5R: Proposed Contact Water Pipe



Summary for Reach 7R: Proposed Contact Water Pipe

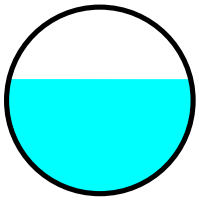
[52] Hint: Inlet/Outlet conditions not evaluated
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.4561 ha, 72.00% Impervious, Inflow Depth > 126 mm for 100-year, 24-hour event
Inflow = 0.2759 m³/s @ 11.95 hrs, Volume= 0.574 Ml
Outflow = 0.2576 m³/s @ 11.99 hrs, Volume= 0.573 Ml, Atten= 7%, Lag= 2.3 min
Routed to Reach 5R : Proposed Contact Water Pipe

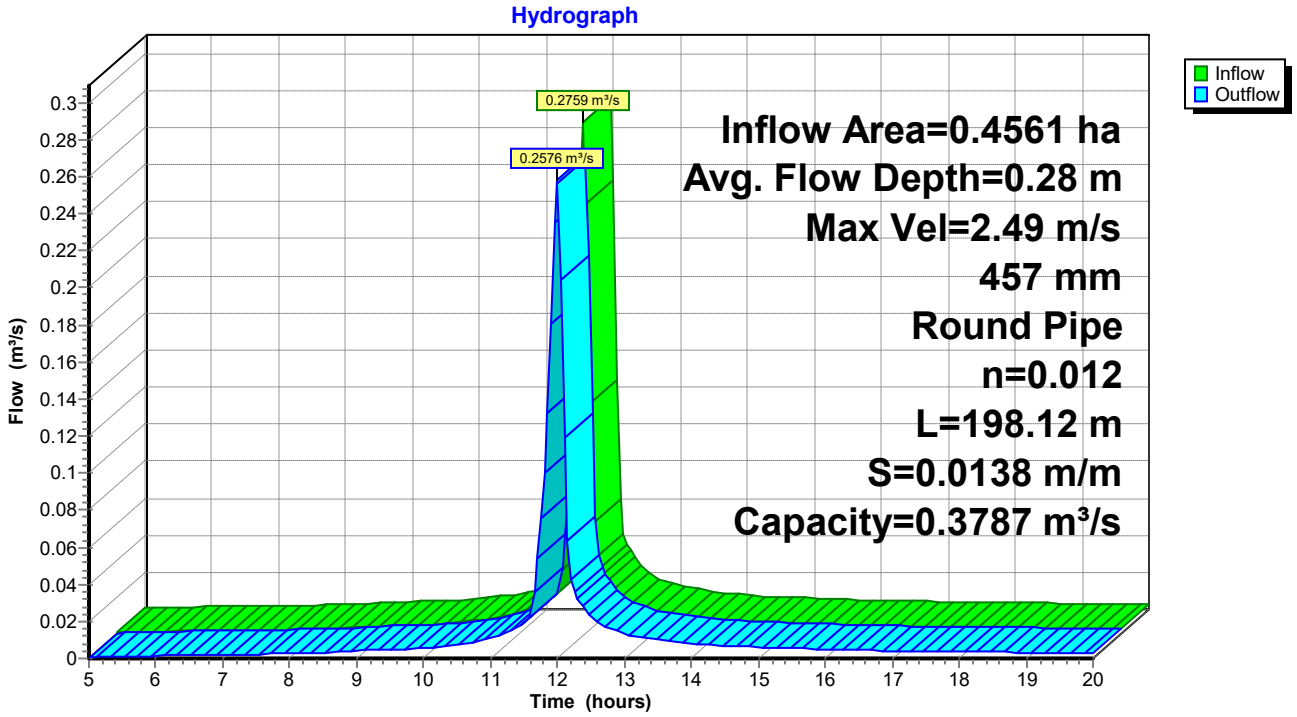
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.49 m/s, Min. Travel Time= 1.3 min
Avg. Velocity = 0.84 m/s, Avg. Travel Time= 3.9 min

Peak Storage= 21.0 m³ @ 11.97 hrs
Average Depth at Peak Storage= 0.28 m , Surface Width= 0.44 m
Bank-Full Depth= 0.46 m Flow Area= 0.16 m², Capacity= 0.3787 m³/s

457 mm Round Pipe
n= 0.012 Concrete pipe, finished
Length= 198.12 m Slope= 0.0138 m/m
Inlet Invert= 251.765 m, Outlet Invert= 249.022 m



Reach 7R: Proposed Contact Water Pipe



Summary for Reach 8R: Proposed Contact Water Pipe

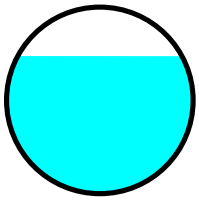
[52] Hint: Inlet/Outlet conditions not evaluated
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.9615 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.6149 m³/s @ 11.95 hrs, Volume= 1.361 Ml
Outflow = 0.5867 m³/s @ 11.97 hrs, Volume= 1.360 Ml, Atten= 5%, Lag= 1.0 min
Routed to Reach 2R : Proposed Contact Water Pipe

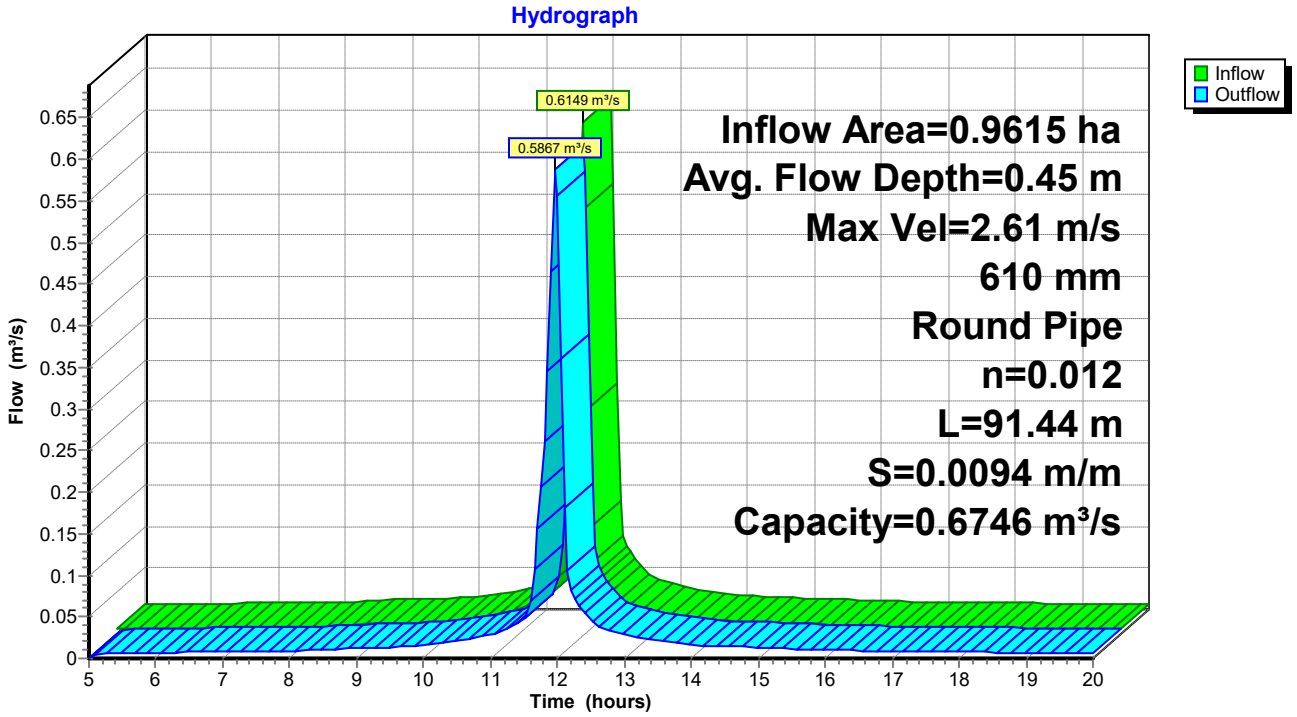
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.61 m/s, Min. Travel Time= 0.6 min
Avg. Velocity = 0.94 m/s, Avg. Travel Time= 1.6 min

Peak Storage= 21.1 m³ @ 11.96 hrs
Average Depth at Peak Storage= 0.45 m , Surface Width= 0.54 m
Bank-Full Depth= 0.61 m Flow Area= 0.29 m², Capacity= 0.6746 m³/s

610 mm Round Pipe
n= 0.012 Concrete pipe, finished
Length= 91.44 m Slope= 0.0094 m/m
Inlet Invert= 257.861 m, Outlet Invert= 257.000 m



Reach 8R: Proposed Contact Water Pipe



Summary for Reach 10R: Roadway & Ditches

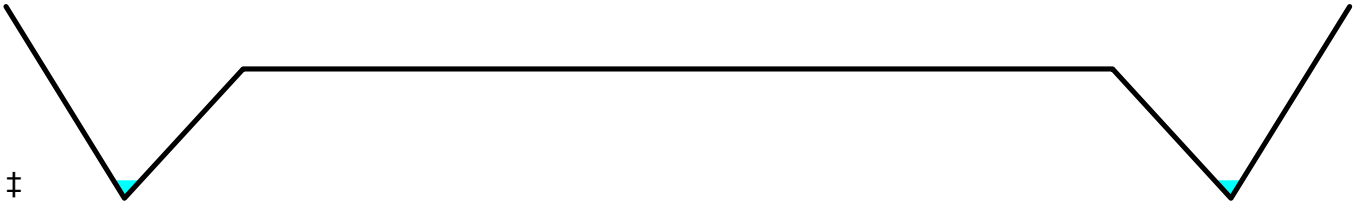
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.0154 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.0098 m³/s @ 11.95 hrs, Volume= 0.022 Ml
Outflow = 0.0087 m³/s @ 12.05 hrs, Volume= 0.022 Ml, Atten= 12%, Lag= 5.7 min
Routed to Pond 11P : Sump 3

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.97 m/s, Min. Travel Time= 3.6 min
Avg. Velocity = 0.40 m/s, Avg. Travel Time= 8.8 min

Peak Storage= 1.9 m³ @ 11.99 hrs
Average Depth at Peak Storage= 0.04 m , Surface Width= 0.42 m
Bank-Full Depth= 0.46 m Flow Area= 1.99 m², Capacity= 8.5571 m³/s

Custom cross-section, Length= 211.00 m Slope= 0.0296 m/m (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 252.750 m, Outlet Invert= 246.500 m

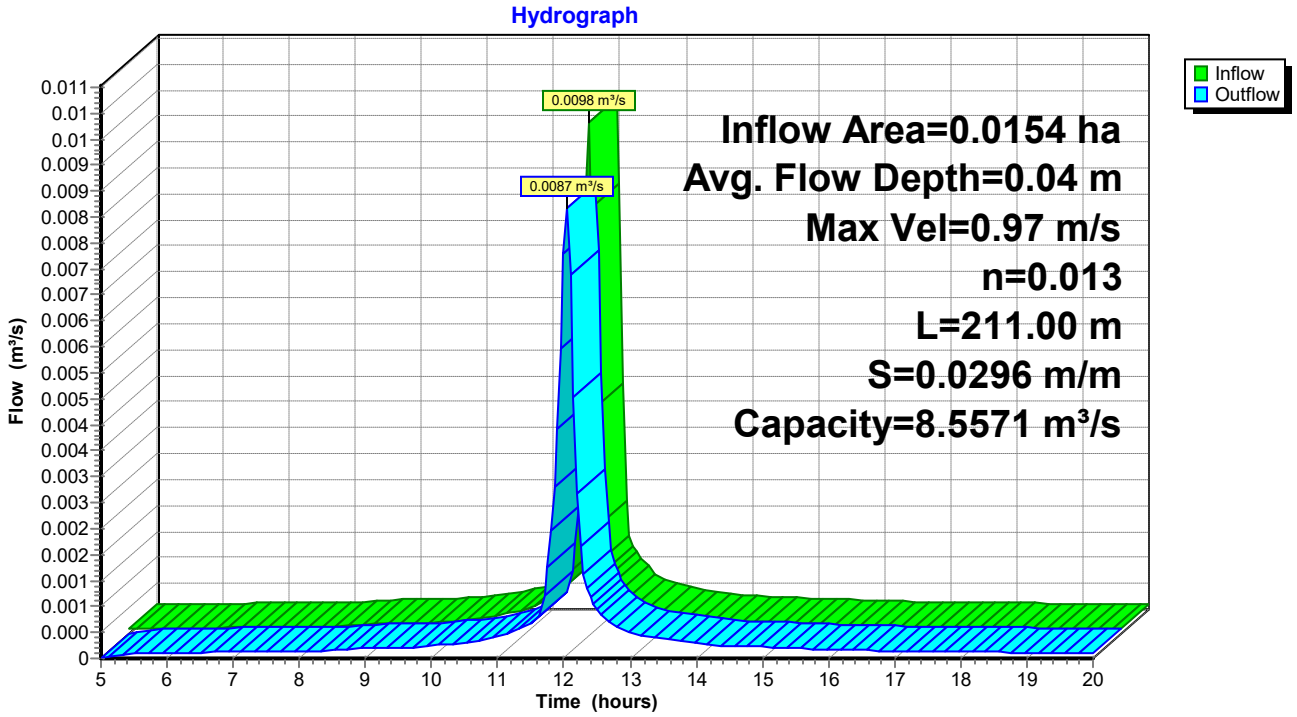


‡

Offset (meters)	Elevation (meters)	Chan.Depth (meters)
0.000	0.150	0.00
0.915	-0.310	0.46
1.830	0.000	0.15
8.540	0.000	0.15
9.455	-0.310	0.46
10.370	0.150	0.00

Depth (meters)	End Area (sq-meters)	Perim. (meters)	Width (meters)	Storage (cubic-meters)	Discharge (m³/s)
0.00	0.00	0.00	0.00	0.0	0.0000
0.31	0.47	10.02	9.77	100.2	0.8230
0.46	1.99	10.69	10.37	419.0	8.5571

Reach 10R: Roadway & Ditches



Summary for Reach 12R: Roadway & Ditches S

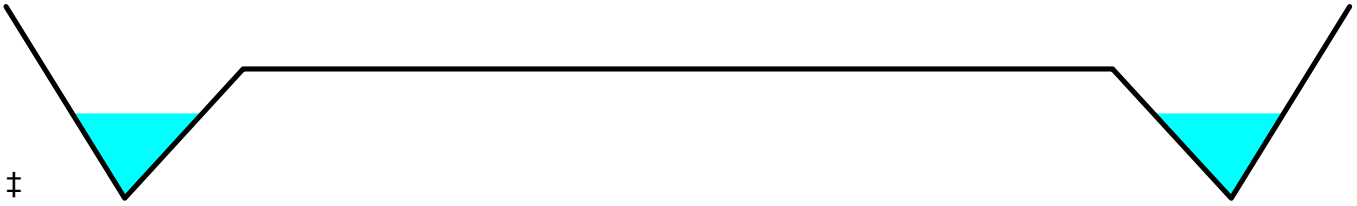
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.6295 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.4025 m³/s @ 11.95 hrs, Volume= 0.891 Ml
Outflow = 0.3204 m³/s @ 12.11 hrs, Volume= 0.885 Ml, Atten= 20%, Lag= 9.5 min
Routed to Reach 21R : WWTP Channel

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.58 m/s, Min. Travel Time= 6.4 min
Avg. Velocity = 0.66 m/s, Avg. Travel Time= 15.4 min

Peak Storage= 124.5 m³ @ 12.00 hrs
Average Depth at Peak Storage= 0.20 m , Surface Width= 2.01 m
Bank-Full Depth= 0.46 m Flow Area= 1.99 m², Capacity= 4.9432 m³/s

Custom cross-section, Length= 607.00 m Slope= 0.0099 m/m (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 257.500 m, Outlet Invert= 251.500 m

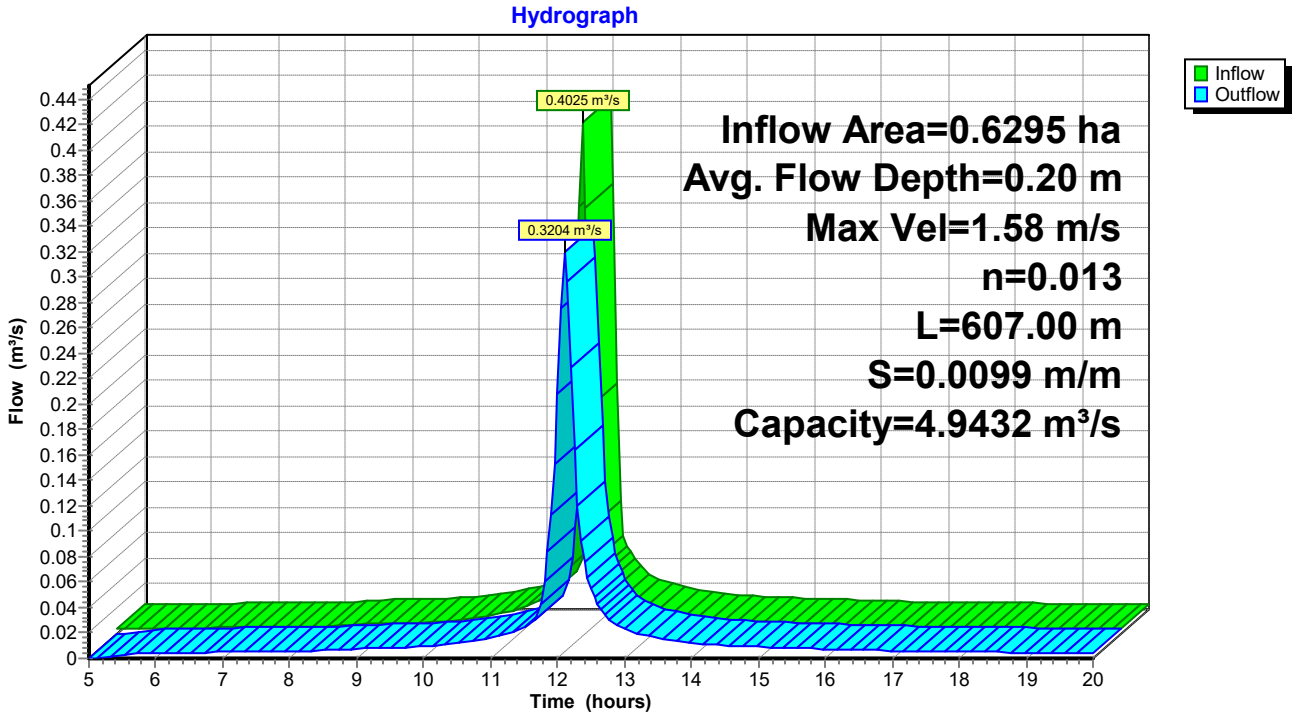


‡

Offset (meters)	Elevation (meters)	Chan.Depth (meters)
0.000	0.150	0.00
0.915	-0.310	0.46
1.830	0.000	0.15
8.540	0.000	0.15
9.455	-0.310	0.46
10.370	0.150	0.00

Depth (meters)	End Area (sq-meters)	Perim. (meters)	Width (meters)	Storage (cubic-meters)	Discharge (m³/s)
0.00	0.00	0.00	0.00	0.0	0.0000
0.31	0.47	10.02	9.77	288.2	0.4754
0.46	1.99	10.69	10.37	1,205.2	4.9432

Reach 12R: Roadway & Ditches S



Summary for Reach 17R: Non-Contact Bypass Spillway

Inflow Area = 62.6009 ha, 78.86% Impervious, Inflow Depth > 29 mm for 100-year, 24-hour event
Inflow = 0.9469 m³/s @ 14.72 hrs, Volume= 17.941 Ml
Outflow = 0.9465 m³/s @ 14.89 hrs, Volume= 17.532 Ml, Atten= 0%, Lag= 10.3 min
Routed to Link 3L : Outfall (To Existing Overland Flow)

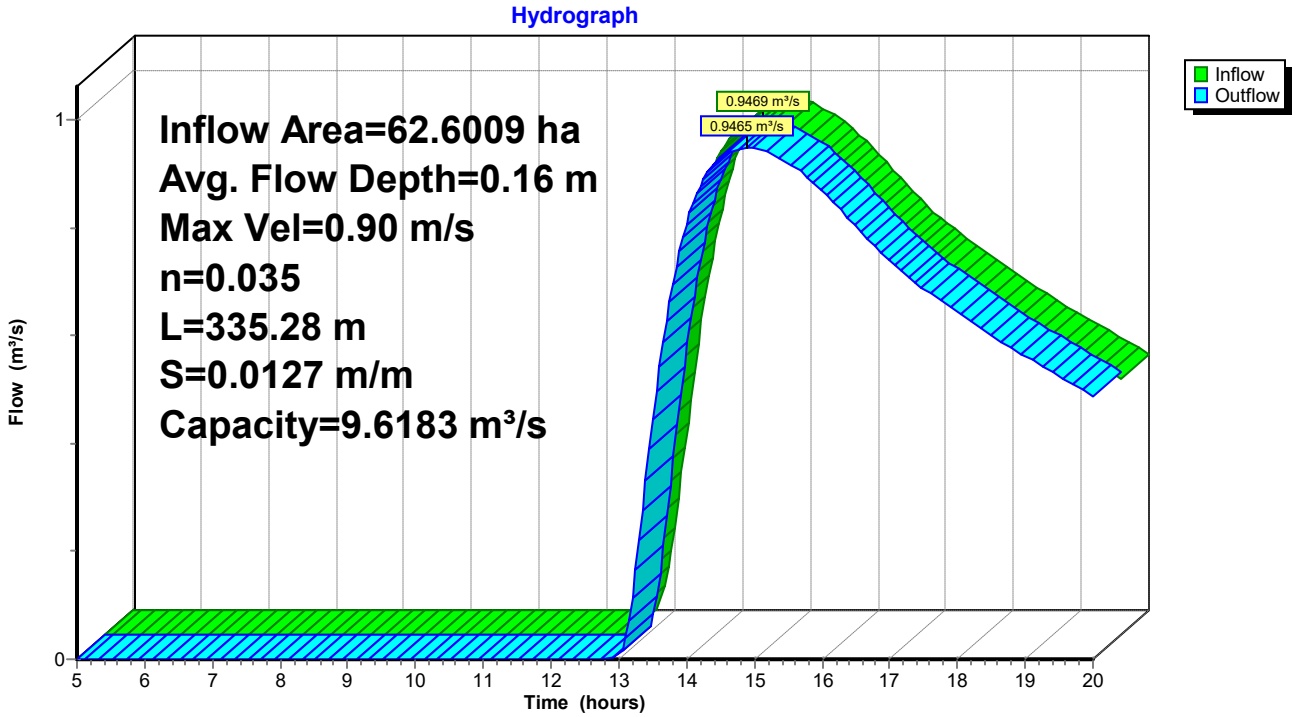
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.90 m/s, Min. Travel Time= 6.2 min
Avg. Velocity = 0.78 m/s, Avg. Travel Time= 7.2 min

Peak Storage= 352.1 m³ @ 14.78 hrs
Average Depth at Peak Storage= 0.16 m , Surface Width= 7.05 m
Bank-Full Depth= 0.61 m Flow Area= 4.83 m², Capacity= 9.6183 m³/s

6.10 m x 0.61 m deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 m/m Top Width= 9.75 m
Length= 335.28 m Slope= 0.0127 m/m
Inlet Invert= 246.888 m, Outlet Invert= 242.621 m



‡



Summary for Reach 19R: Roadway & Ditches W

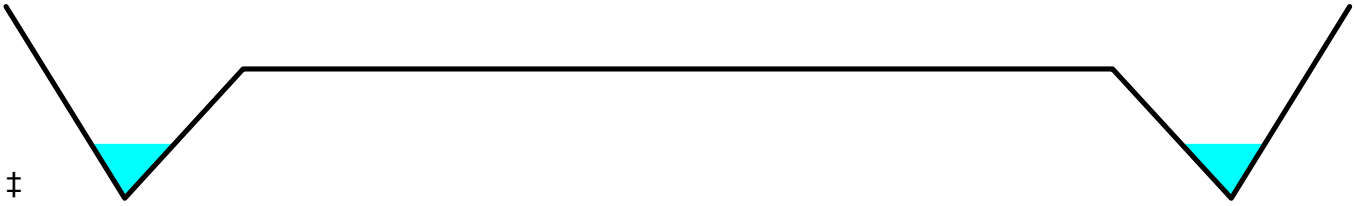
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.2468 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.1578 m³/s @ 11.95 hrs, Volume= 0.349 Ml
Outflow = 0.1461 m³/s @ 12.00 hrs, Volume= 0.349 Ml, Atten= 7%, Lag= 2.7 min
Routed to Reach 21R : WWTP Channel

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.78 m/s, Min. Travel Time= 1.6 min
Avg. Velocity = 0.71 m/s, Avg. Travel Time= 4.1 min

Peak Storage= 14.7 m³ @ 11.97 hrs
Average Depth at Peak Storage= 0.13 m , Surface Width= 1.29 m
Bank-Full Depth= 0.46 m Flow Area= 1.99 m², Capacity= 7.5169 m³/s

Custom cross-section, Length= 175.00 m Slope= 0.0229 m/m (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 255.500 m, Outlet Invert= 251.500 m

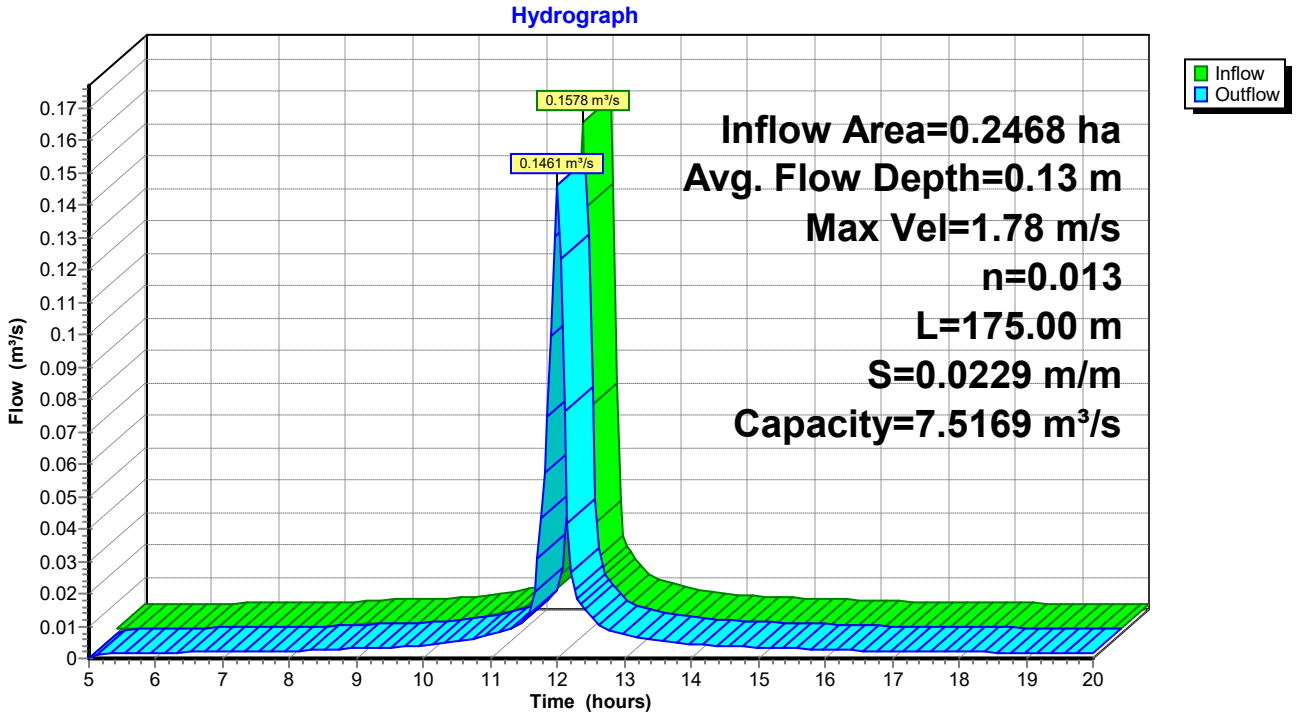


‡

Offset (meters)	Elevation (meters)	Chan.Depth (meters)
0.000	0.150	0.00
0.915	-0.310	0.46
1.830	0.000	0.15
8.540	0.000	0.15
9.455	-0.310	0.46
10.370	0.150	0.00

Depth (meters)	End Area (sq-meters)	Perim. (meters)	Width (meters)	Storage (cubic-meters)	Discharge (m³/s)
0.00	0.00	0.00	0.00	0.0	0.0000
0.31	0.47	10.02	9.77	83.1	0.7230
0.46	1.99	10.69	10.37	347.5	7.5169

Reach 19R: Roadway & Ditches W



Summary for Reach 20R: Roadway & Ditches E

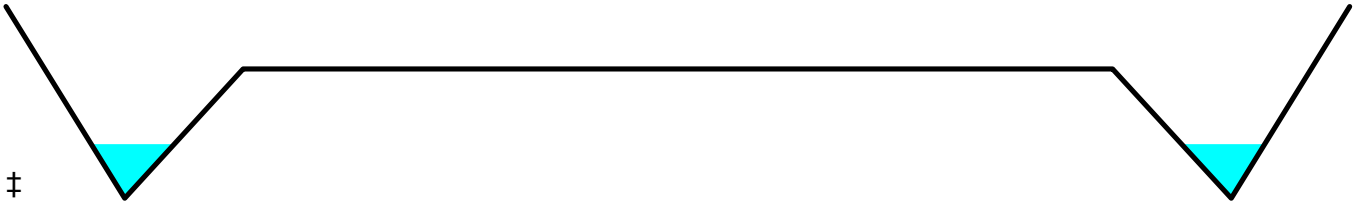
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.2396 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.1532 m³/s @ 11.95 hrs, Volume= 0.339 Ml
Outflow = 0.1395 m³/s @ 12.01 hrs, Volume= 0.338 Ml, Atten= 9%, Lag= 3.7 min
Routed to Reach 21R : WWTP Channel

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.72 m/s, Min. Travel Time= 2.2 min
Avg. Velocity = 0.69 m/s, Avg. Travel Time= 5.5 min

Peak Storage= 19.3 m³ @ 11.98 hrs
Average Depth at Peak Storage= 0.13 m , Surface Width= 1.28 m
Bank-Full Depth= 0.46 m Flow Area= 1.99 m², Capacity= 7.3149 m³/s

Custom cross-section, Length= 231.00 m Slope= 0.0216 m/m (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 256.500 m, Outlet Invert= 251.500 m

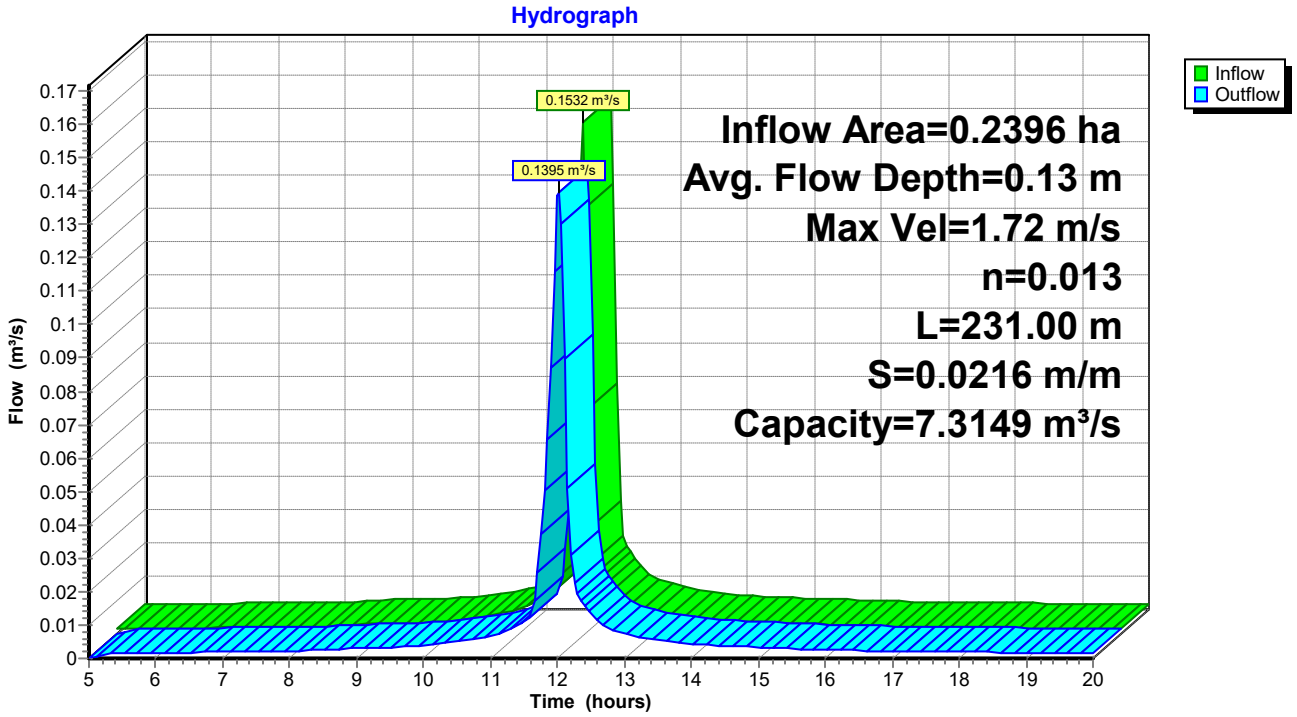


‡

Offset (meters)	Elevation (meters)	Chan.Depth (meters)
0.000	0.150	0.00
0.915	-0.310	0.46
1.830	0.000	0.15
8.540	0.000	0.15
9.455	-0.310	0.46
10.370	0.150	0.00

Depth (meters)	End Area (sq-meters)	Perim. (meters)	Width (meters)	Storage (cubic-meters)	Discharge (m³/s)
0.00	0.00	0.00	0.00	0.0	0.0000
0.31	0.47	10.02	9.77	109.7	0.7035
0.46	1.99	10.69	10.37	458.7	7.3149

Reach 20R: Roadway & Ditches E



Summary for Reach 21R: WWTP Channel

[82] Warning: Early inflow requires earlier time span
[62] Hint: Exceeded Reach 12R OUTLET depth by 0.195 m @ 11.95 hrs
[62] Hint: Exceeded Reach 19R OUTLET depth by 0.260 m @ 11.95 hrs
[62] Hint: Exceeded Reach 20R OUTLET depth by 0.261 m @ 11.95 hrs

Inflow Area = 5.7009 ha,100.00% Impervious, Inflow Depth > 141 mm for 100-year, 24-hour event
Inflow = 3.3353 m³/s @ 11.95 hrs, Volume= 8.063 Ml
Outflow = 3.2093 m³/s @ 11.97 hrs, Volume= 8.054 Ml, Atten= 4%, Lag= 1.0 min
Routed to Pond 1P : Existing Bedell/Future Contact Pond

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.04 m/s, Min. Travel Time= 0.6 min
Avg. Velocity = 1.40 m/s, Avg. Travel Time= 1.6 min

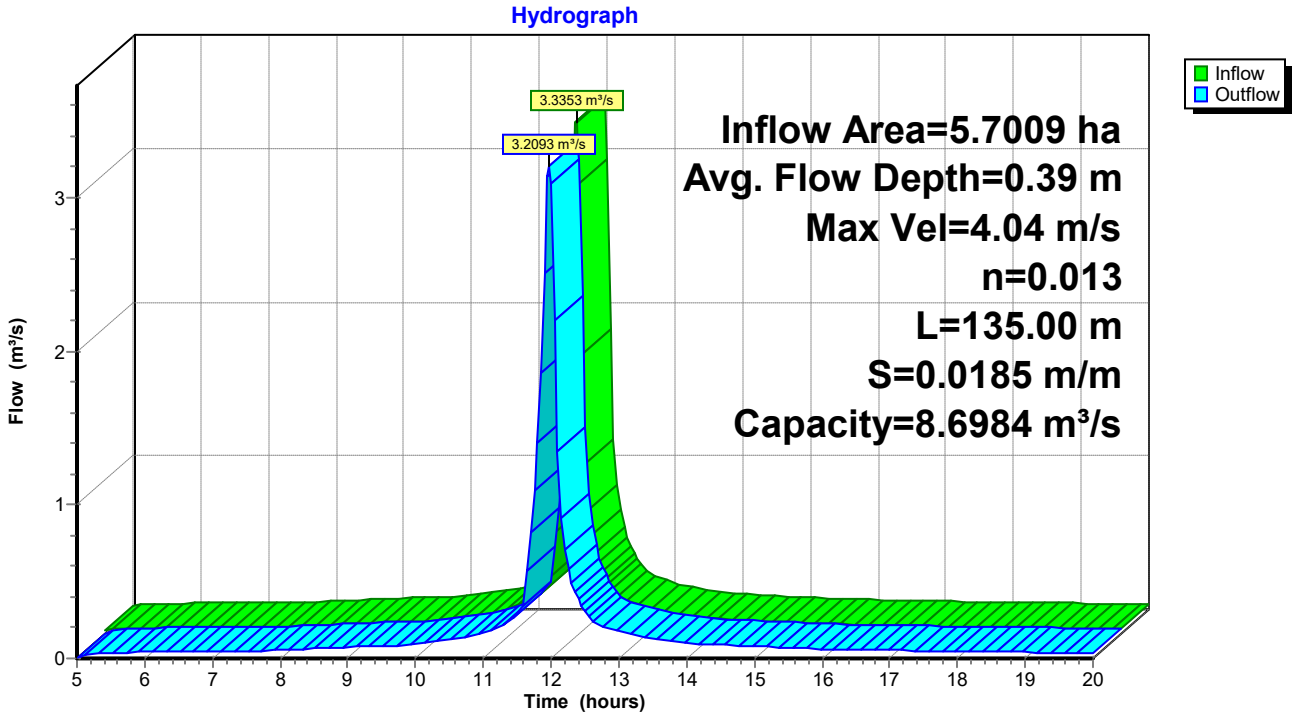
Peak Storage= 109.7 m³ @ 11.96 hrs
Average Depth at Peak Storage= 0.39 m , Surface Width= 3.25 m
Bank-Full Depth= 0.61 m Flow Area= 1.67 m², Capacity= 8.6984 m³/s

0.91 m x 0.61 m deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 3.0 m/m Top Width= 4.57 m
Length= 135.00 m Slope= 0.0185 m/m
Inlet Invert= 251.500 m, Outlet Invert= 249.000 m



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Reach 21R: WWTP Channel



Summary for Reach 22R: North Roadway & Ditches

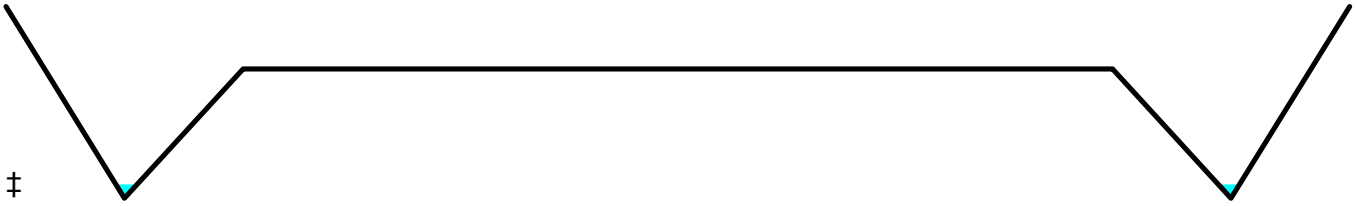
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.0080 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.0051 m³/s @ 11.95 hrs, Volume= 0.011 Ml
Outflow = 0.0048 m³/s @ 11.99 hrs, Volume= 0.011 Ml, Atten= 7%, Lag= 2.3 min
Routed to Pond 24P : Sump 4

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.93 m/s, Min. Travel Time= 1.4 min
Avg. Velocity = 0.39 m/s, Avg. Travel Time= 3.3 min

Peak Storage= 0.4 m³ @ 11.97 hrs
Average Depth at Peak Storage= 0.03 m , Surface Width= 0.32 m
Bank-Full Depth= 0.46 m Flow Area= 1.99 m², Capacity= 9.8139 m³/s

Custom cross-section, Length= 77.00 m Slope= 0.0390 m/m (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 253.000 m, Outlet Invert= 250.000 m

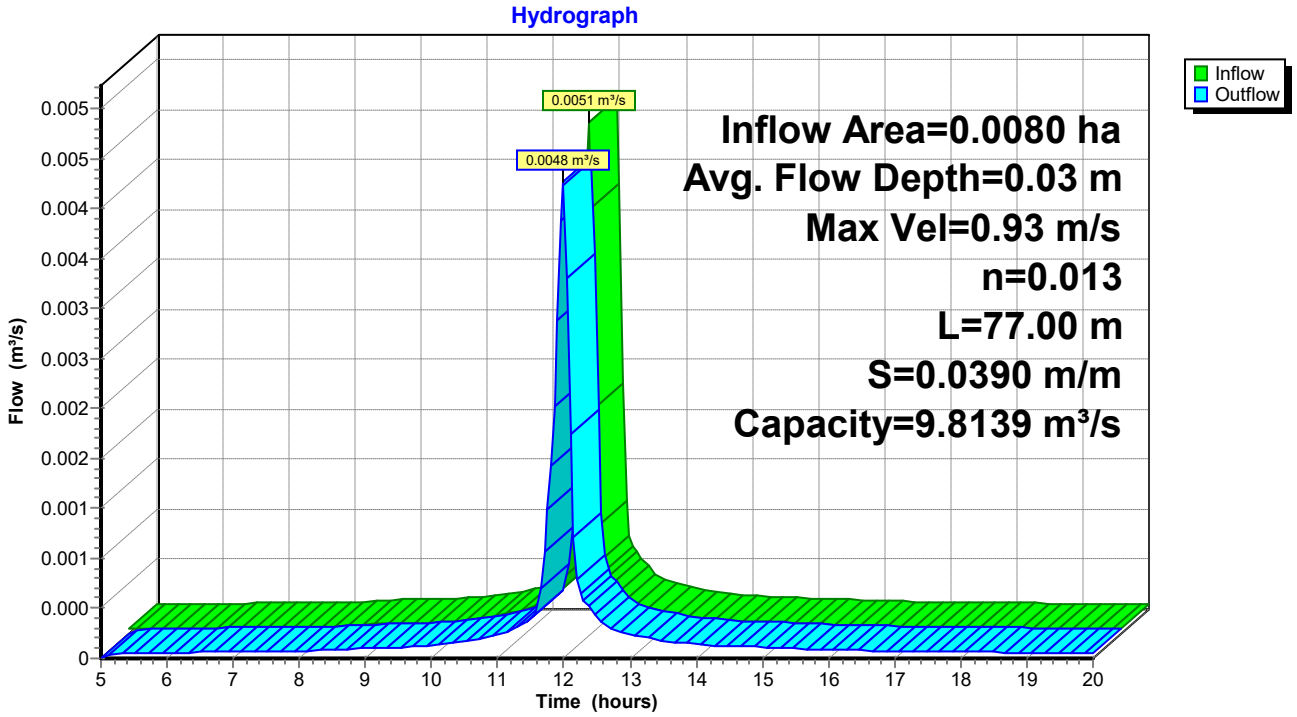


‡

Offset (meters)	Elevation (meters)	Chan.Depth (meters)
0.000	0.150	0.00
0.915	-0.310	0.46
1.830	0.000	0.15
8.540	0.000	0.15
9.455	-0.310	0.46
10.370	0.150	0.00

Depth (meters)	End Area (sq-meters)	Perim. (meters)	Width (meters)	Storage (cubic-meters)	Discharge (m³/s)
0.00	0.00	0.00	0.00	0.0	0.0000
0.31	0.47	10.02	9.77	36.6	0.9439
0.46	1.99	10.69	10.37	152.9	9.8139

Reach 22R: North Roadway & Ditches



Summary for Reach 23R: Roadway & Ditches

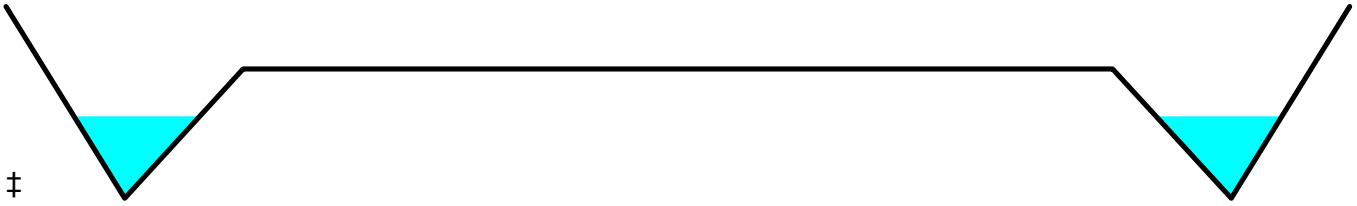
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.3660 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.2340 m³/s @ 11.95 hrs, Volume= 0.518 Ml
Outflow = 0.1918 m³/s @ 12.10 hrs, Volume= 0.515 Ml, Atten= 18%, Lag= 8.8 min
Routed to Pond 26P : Sump 2

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.01 m/s, Min. Travel Time= 5.8 min
Avg. Velocity = 0.42 m/s, Avg. Travel Time= 14.1 min

Peak Storage= 67.3 m³ @ 12.00 hrs
Average Depth at Peak Storage= 0.20 m , Surface Width= 1.94 m
Bank-Full Depth= 0.46 m Flow Area= 1.99 m², Capacity= 3.2411 m³/s

Custom cross-section, Length= 353.00 m Slope= 0.0042 m/m (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 252.750 m, Outlet Invert= 251.250 m

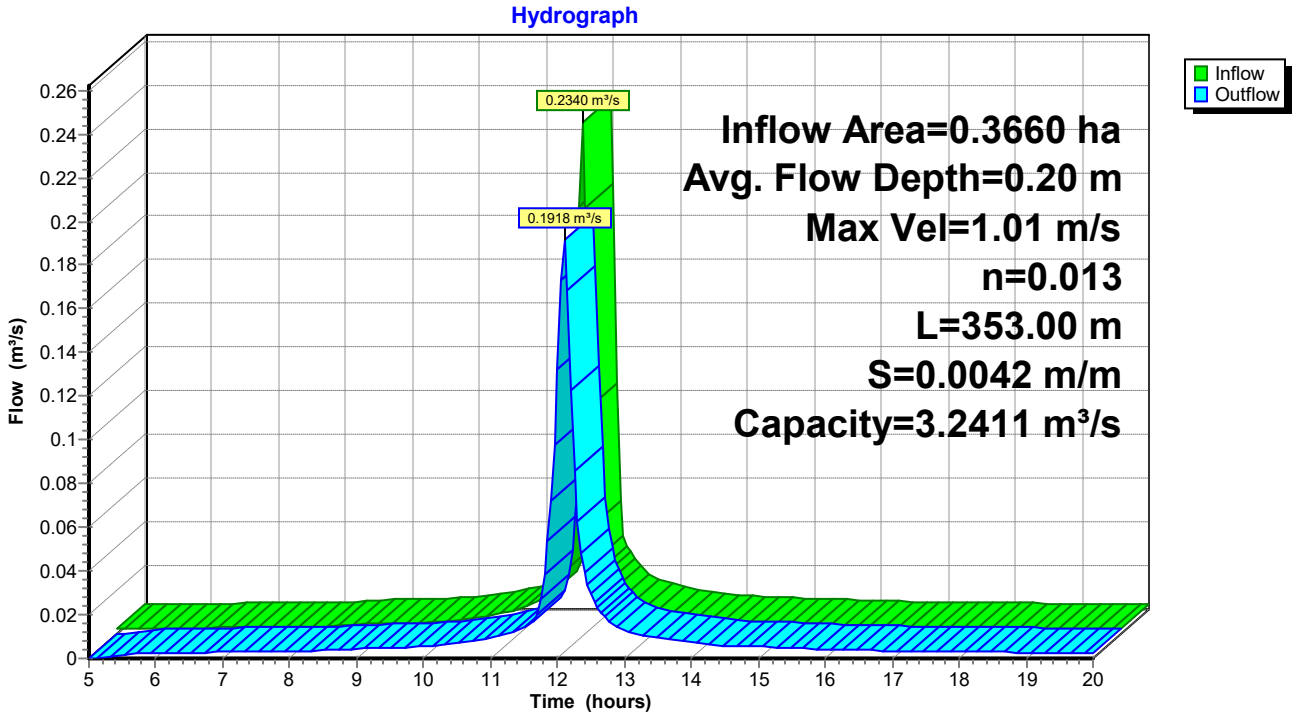


‡

Offset (meters)	Elevation (meters)	Chan.Depth (meters)
0.000	0.150	0.00
0.915	-0.310	0.46
1.830	0.000	0.15
8.540	0.000	0.15
9.455	-0.310	0.46
10.370	0.150	0.00

Depth (meters)	End Area (sq-meters)	Perim. (meters)	Width (meters)	Storage (cubic-meters)	Discharge (m³/s)
0.00	0.00	0.00	0.00	0.0	0.0000
0.31	0.47	10.02	9.77	167.6	0.3117
0.46	1.99	10.69	10.37	700.9	3.2411

Reach 23R: Roadway & Ditches



Summary for Reach 26R: West Roadway & Ditches

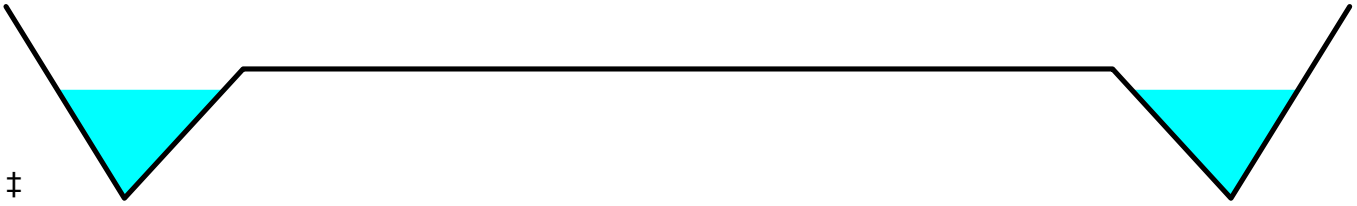
[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.5560 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.9950 m³/s @ 11.95 hrs, Volume= 2.203 Ml
Outflow = 0.6109 m³/s @ 12.26 hrs, Volume= 2.171 Ml, Atten= 39%, Lag= 18.4 min
Routed to Pond 26P : Sump 2

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.85 m/s, Min. Travel Time= 13.5 min
Avg. Velocity = 0.82 m/s, Avg. Travel Time= 30.4 min

Peak Storage= 501.1 m³ @ 12.03 hrs
Average Depth at Peak Storage= 0.26 m , Surface Width= 2.57 m
Bank-Full Depth= 0.46 m Flow Area= 1.99 m², Capacity= 4.9304 m³/s

Custom cross-section, Length= 1,500.00 m Slope= 0.0098 m/m (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 264.750 m, Outlet Invert= 250.000 m

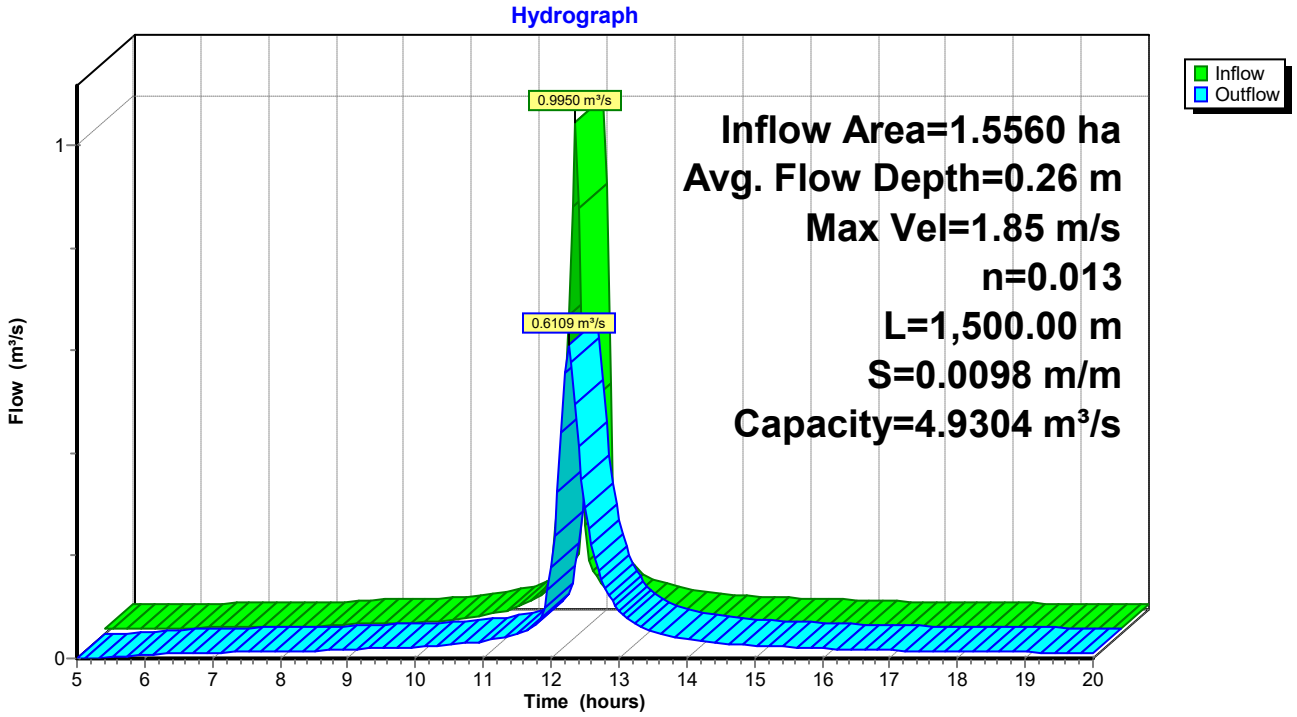


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Offset (meters)	Elevation (meters)	Chan.Depth (meters)
0.000	0.150	0.00
0.915	-0.310	0.46
1.830	0.000	0.15
8.540	0.000	0.15
9.455	-0.310	0.46
10.370	0.150	0.00

Depth (meters)	End Area (sq-meters)	Perim. (meters)	Width (meters)	Storage (cubic-meters)	Discharge (m³/s)
0.00	0.00	0.00	0.00	0.0	0.0000
0.31	0.47	10.02	9.77	712.2	0.4742
0.46	1.99	10.69	10.37	2,978.3	4.9304

Reach 26R: West Roadway & Ditches



Summary for Reach 27R: East Roadway & Ditches

[82] Warning: Early inflow requires earlier time span
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 2.3290 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 1.4893 m³/s @ 11.95 hrs, Volume= 3.297 Ml
Outflow = 0.7816 m³/s @ 12.39 hrs, Volume= 3.261 Ml, Atten= 48%, Lag= 26.3 min
Routed to Pond 26P : Sump 2

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.97 m/s, Min. Travel Time= 10.5 min
Avg. Velocity = 0.87 m/s, Avg. Travel Time= 23.7 min

Peak Storage= 732.1 m³ @ 12.06 hrs
Average Depth at Peak Storage= 0.32 m , Surface Width= 9.82 m
Bank-Full Depth= 0.46 m Flow Area= 1.99 m², Capacity= 4.7358 m³/s

Custom cross-section, Length= 1,240.00 m Slope= 0.0091 m/m (101 Elevation Intervals)
Constant n= 0.013 Asphalt, smooth
Inlet Invert= 262.500 m, Outlet Invert= 251.250 m

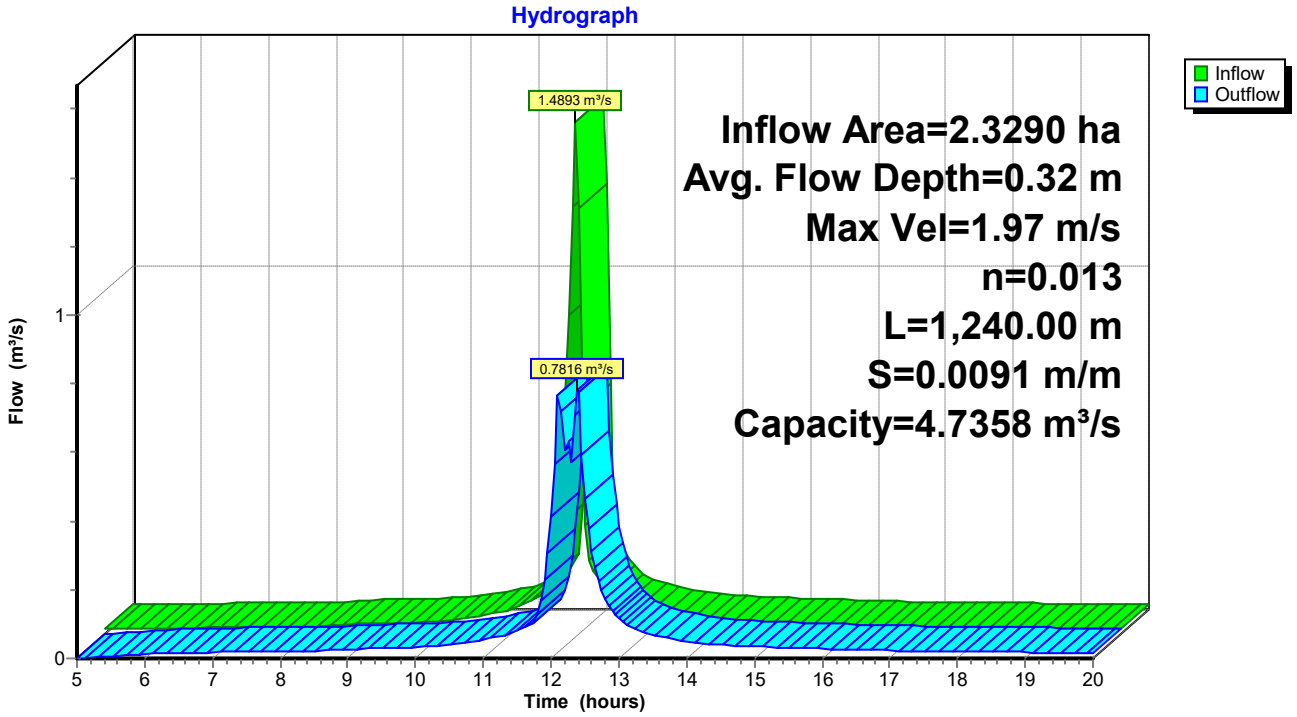


‡

Offset (meters)	Elevation (meters)	Chan.Depth (meters)
0.000	0.150	0.00
0.915	-0.310	0.46
1.830	0.000	0.15
8.540	0.000	0.15
9.455	-0.310	0.46
10.370	0.150	0.00

Depth (meters)	End Area (sq-meters)	Perim. (meters)	Width (meters)	Storage (cubic-meters)	Discharge (m³/s)
0.00	0.00	0.00	0.00	0.0	0.0000
0.31	0.47	10.02	9.77	588.8	0.4555
0.46	1.99	10.69	10.37	2,462.1	4.7358

Reach 27R: East Roadway & Ditches



Summary for Pond 1P: Existing Bedell/Future Contact Pond

[62] Hint: Exceeded Reach 2R OUTLET depth by 3.225 m @ 19.95 hrs
[62] Hint: Exceeded Reach 5R OUTLET depth by 0.323 m @ 19.95 hrs

Inflow Area = 38.3494 ha, 78.87% Impervious, Inflow Depth > 129 mm for 100-year, 24-hour event
Inflow = 14.8809 m³/s @ 12.02 hrs, Volume= 49.513 Ml
Outflow = 0.0000 m³/s @ 5.00 hrs, Volume= 0.000 Ml, Atten= 100%, Lag= 0.0 min
Primary = 0.0000 m³/s @ 5.00 hrs, Volume= 0.000 Ml
Routed to Link 1L : Outfall (To Effluent TP)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 248.777 m @ 20.00 hrs Surf.Area= 1.6276 ha Storage= 49.492 Ml

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

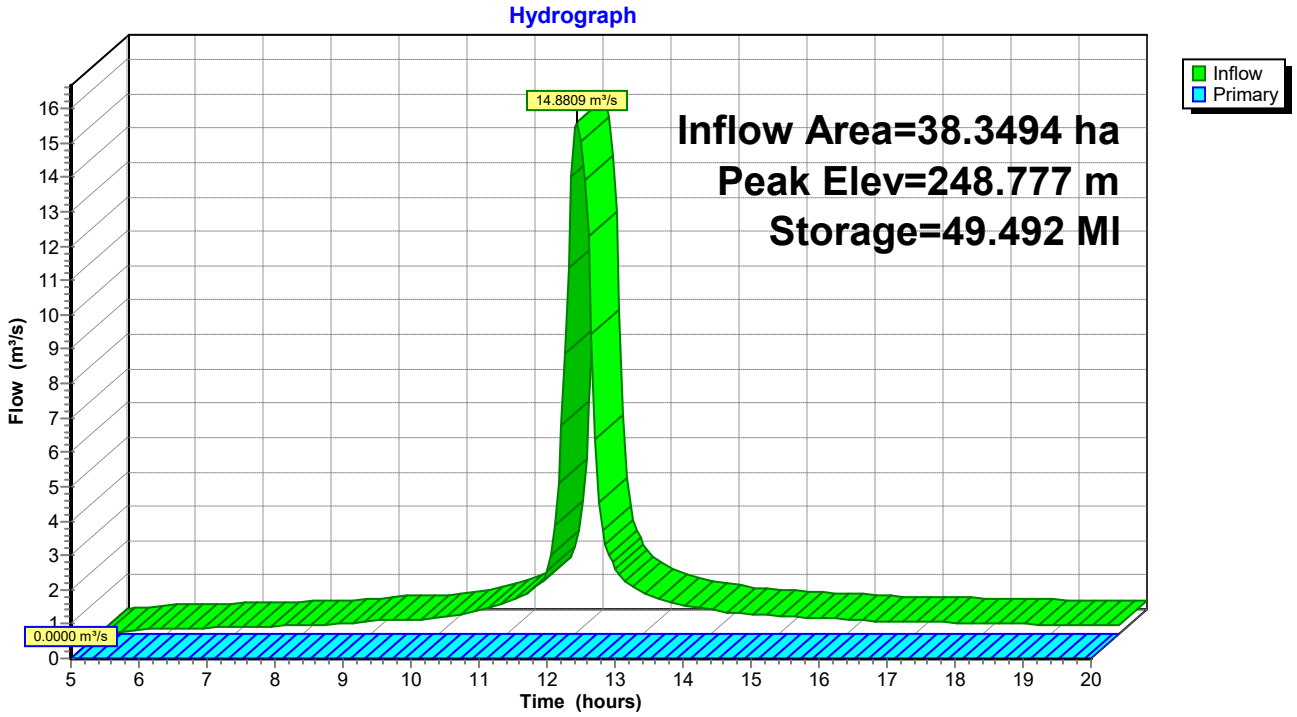
Volume	Invert	Avail.Storage	Storage Description
#1	244.970 m	90.112 Ml	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (meters)	Surf.Area (hectares)	Inc.Store (Mega-liters)	Cum.Store (Mega-liters)
244.970	0.0001	0.000	0.000
245.000	1.0036	0.151	0.151
246.000	1.1574	10.805	10.956
247.000	1.3193	12.384	23.339
248.000	1.4892	14.043	37.382
249.000	1.6673	15.783	53.164
250.000	1.8494	17.584	70.748
251.000	2.0234	19.364	90.112

Device	Routing	Invert	Outlet Devices
#1	Primary	250.390 m	**15.24 m long + 2.0 m/m SideZ x 3.05 m breadth Broad-Crested Rectangular We** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.37 1.41 1.49 1.49 1.48 1.49 1.47 1.46

Primary OutFlow Max=0.0000 m³/s @ 5.00 hrs HW=244.970 m (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.0000 m³/s)

Pond 1P: Existing Bedell/Future Contact Pond



Summary for Pond 2P: Proposed SE Contact Sump

[82] Warning: Early inflow requires earlier time span

Inflow Area = 28.4862 ha, 72.00% Impervious, Inflow Depth > 126 mm for 100-year, 24-hour event
Inflow = 17.0302 m³/s @ 11.95 hrs, Volume= 35.864 Ml
Outflow = 12.2572 m³/s @ 12.02 hrs, Volume= 35.795 Ml, Atten= 28%, Lag= 3.9 min
Primary = 12.2572 m³/s @ 12.02 hrs, Volume= 35.795 Ml
Routed to Reach 2R : Proposed Contact Water Pipe
Secondary = 0.0000 m³/s @ 5.00 hrs, Volume= 0.000 Ml

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 262.870 m @ 12.02 hrs Surf.Area= 0.1444 ha Storage= 3.320 Ml

Plug-Flow detention time= 3.9 min calculated for 35.789 Ml (100% of inflow)
Center-of-Mass det. time= 2.9 min (748.2 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1	257.970 m	4.311 Ml	**Custom Stage Data (Prismatic)** Listed below (Recalc)

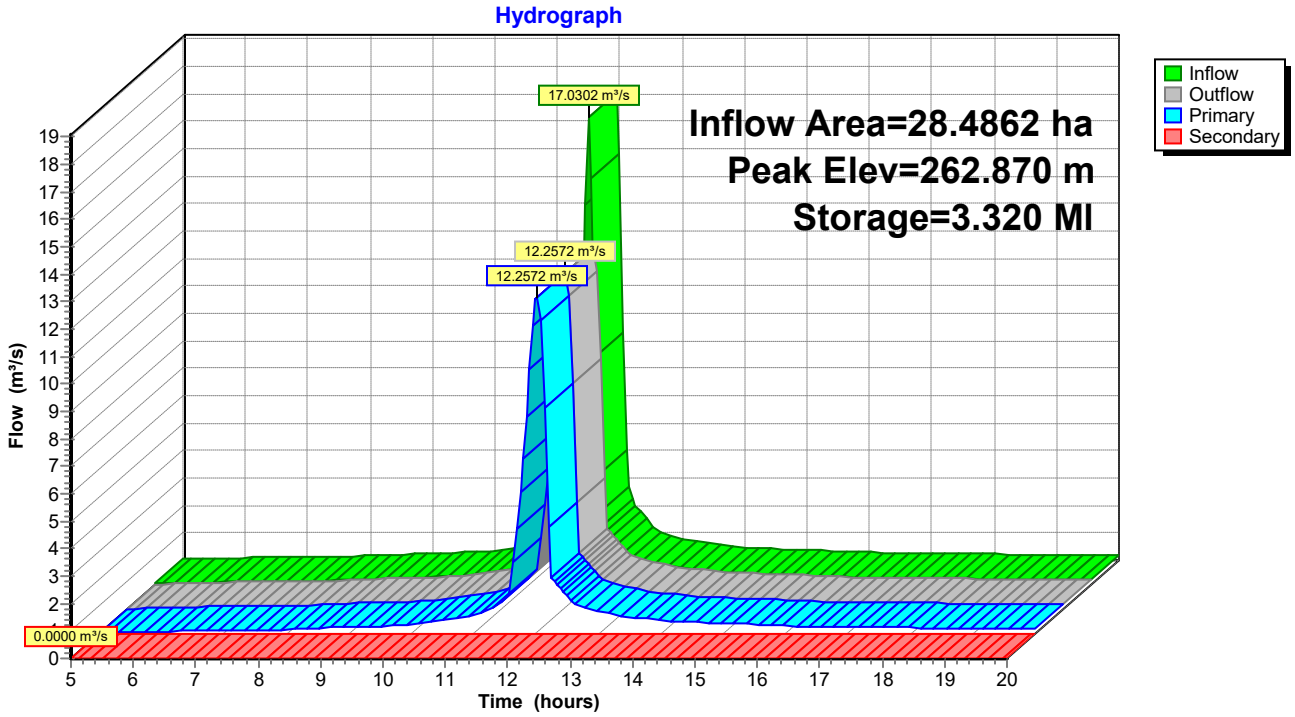
Elevation (meters)	Surf.Area (hectares)	Inc.Store (Mega-liters)	Cum.Store (Mega-liters)
257.970	0.0001	0.000	0.000
258.000	0.0259	0.004	0.004
259.000	0.0364	0.312	0.315
260.000	0.0445	0.405	0.720
261.000	0.0728	0.587	1.306
262.000	0.1093	0.911	2.217
263.000	0.1497	1.295	3.512
263.500	0.1700	0.799	4.311

Device	Routing	Invert	Outlet Devices
#1	Primary	258.000 m	**1,829 mm Round RCP_Round 72"** L= 30.48 m RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 258.000 m / 257.000 m S= 0.0328 m/m Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.627 m²
#2	Secondary	263.195 m	**6.10 m long + 2.0 m/m SideZ x 3.05 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.37 1.41 1.49 1.49 1.48 1.49 1.47 1.46

Primary OutFlow Max=12.1321 m³/s @ 12.02 hrs HW=262.792 m (Free Discharge)
1=RCP_Round 72" (Inlet Controls 12.1321 m³/s @ 4.62 m/s)

Secondary OutFlow Max=0.0000 m³/s @ 5.00 hrs HW=258.006 m (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.0000 m³/s)

Pond 2P: Proposed SE Contact Sump



Summary for Pond 3P: Non-Contact Ponds

Inflow Area = 62.6009 ha, 78.86% Impervious, Inflow Depth > 132 mm for 100-year, 24-hour event
Inflow = 28.3645 m³/s @ 12.09 hrs, Volume= 82.483 Ml
Outflow = 0.9469 m³/s @ 14.72 hrs, Volume= 17.941 Ml, Atten= 97%, Lag= 157.6 min
Primary = 0.9469 m³/s @ 14.72 hrs, Volume= 17.941 Ml
Routed to Reach 17R : Non-Contact Bypass Spillway

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 251.977 m @ 14.72 hrs Surf.Area= 2.7265 ha Storage= 66.568 Ml

Plug-Flow detention time= 381.8 min calculated for 17.940 Ml (22% of inflow)
Center-of-Mass det. time= 225.8 min (976.6 - 750.8)

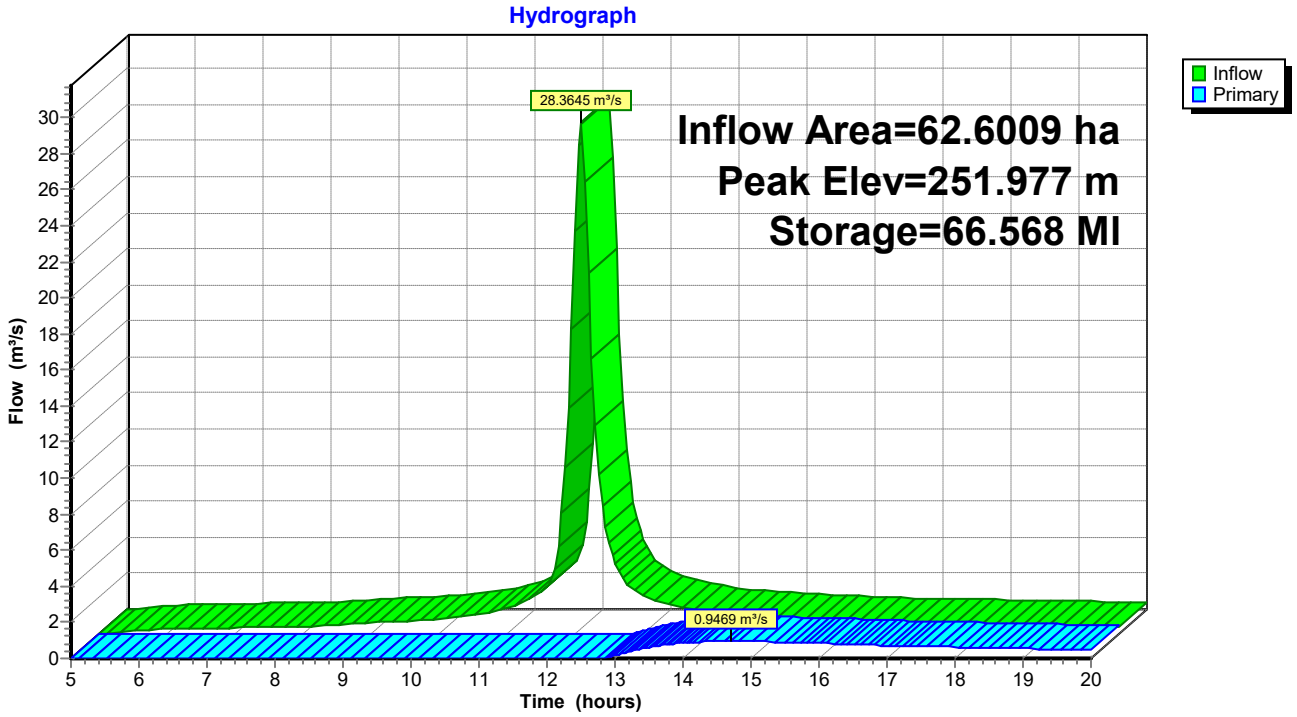
Volume	Invert	Avail.Storage	Storage Description
#1	246.888 m	97.063 Ml	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (meters)	Surf.Area (hectares)	Inc.Store (Mega-liters)	Cum.Store (Mega-liters)
246.888	0.0405	0.000	0.000
249.936	1.4981	23.448	23.448
252.984	3.3322	73.614	97.063

Device	Routing	Invert	Outlet Devices
#1	Primary	251.765 m	**6.10 m long + 2.0 m/m SideZ x 3.05 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.37 1.41 1.49 1.49 1.48 1.49 1.47 1.46

Primary OutFlow Max=0.9385 m³/s @ 14.72 hrs HW=251.977 m (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.9385 m³/s @ 0.68 m/s)

Pond 3P: Non-Contact Ponds



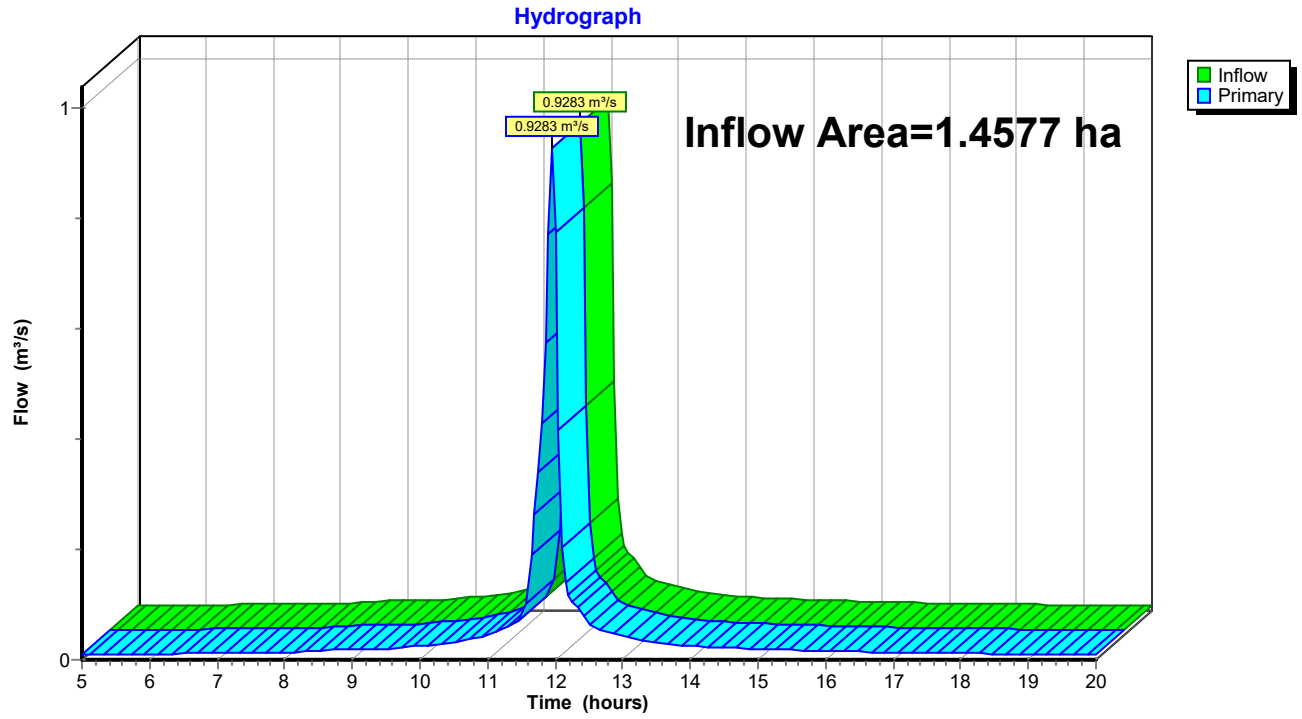
Summary for Pond 11P: Sump 3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.4577 ha,100.00% Impervious, Inflow Depth > 142 mm for 100-year, 24-hour event
Inflow = 0.9283 m³/s @ 11.95 hrs, Volume= 2.064 Ml
Primary = 0.9283 m³/s @ 11.95 hrs, Volume= 2.064 Ml, Atten= 0%, Lag= 0.0 min
Routed to Pond 1P : Existing Bedell/Future Contact Pond

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 11P: Sump 3



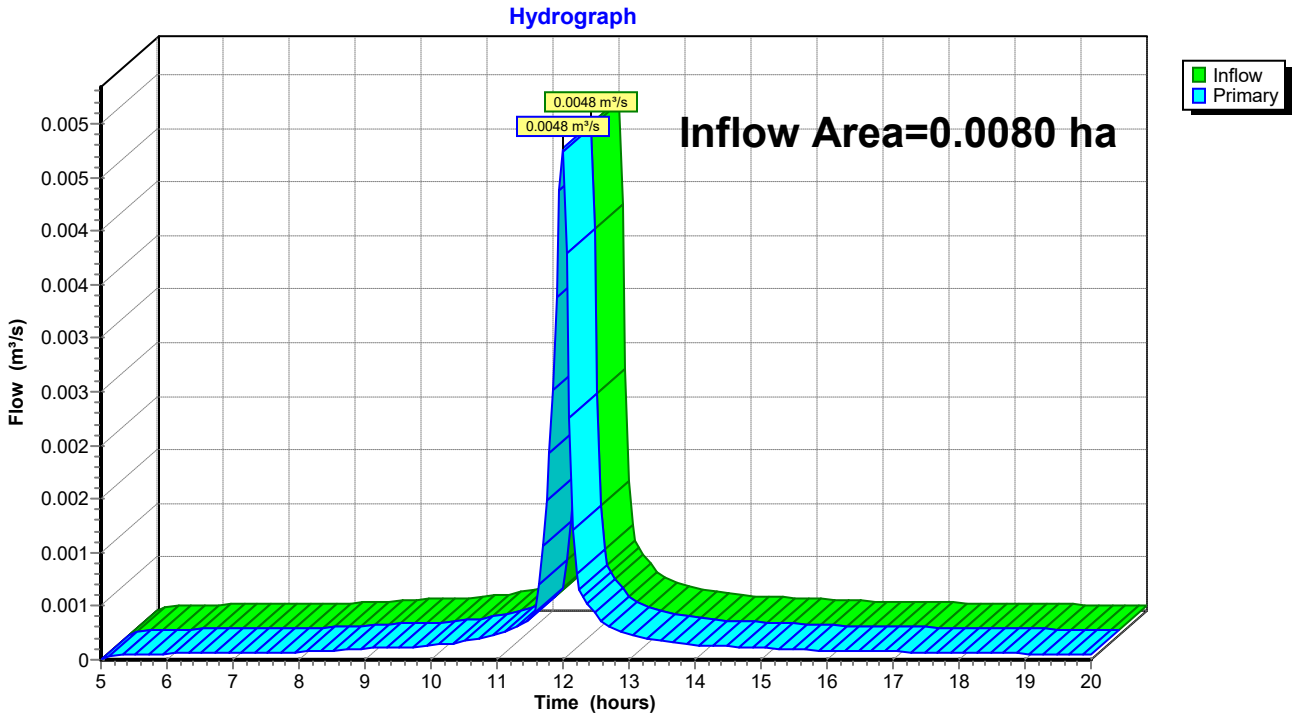
Summary for Pond 24P: Sump 4

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.0080 ha,100.00% Impervious, Inflow Depth > 141 mm for 100-year, 24-hour event
Inflow = 0.0048 m³/s @ 11.99 hrs, Volume= 0.011 Ml
Primary = 0.0048 m³/s @ 11.99 hrs, Volume= 0.011 Ml, Atten= 0%, Lag= 0.0 min
Routed to Pond 26P : Sump 2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 24P: Sump 4



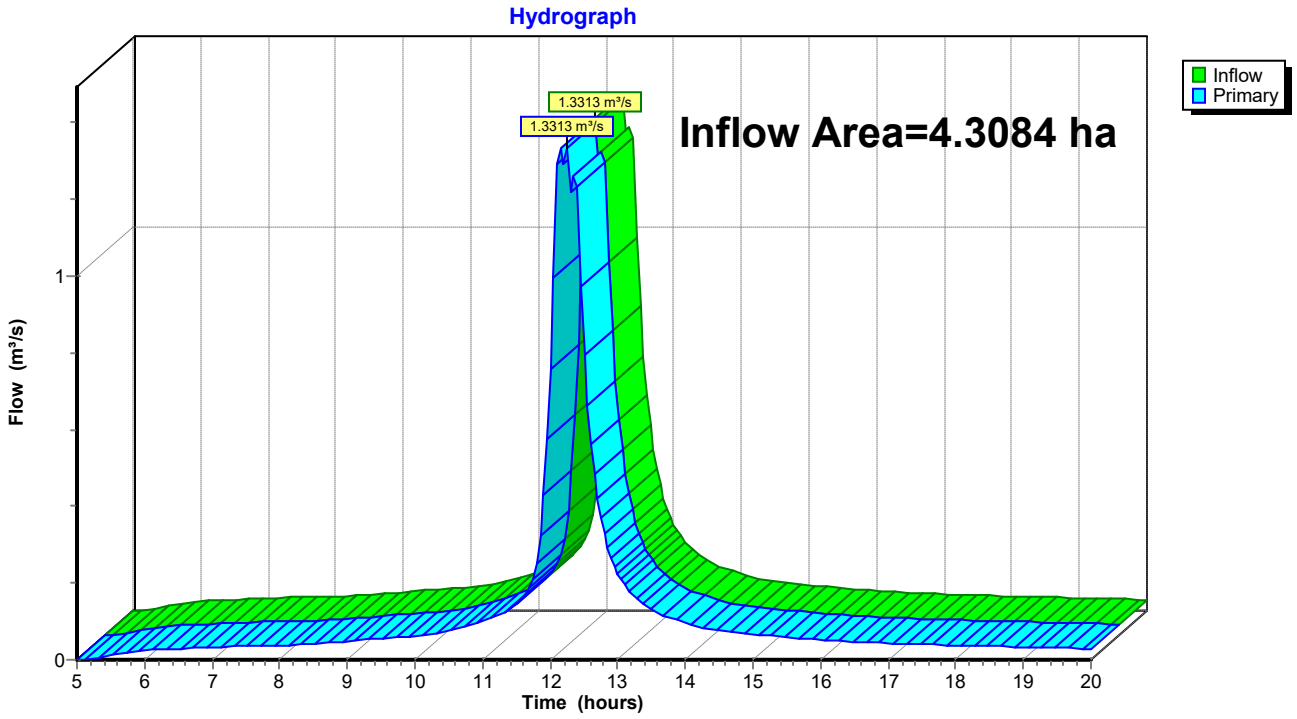
Summary for Pond 26P: Sump 2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.3084 ha,100.00% Impervious, Inflow Depth > 140 mm for 100-year, 24-hour event
Inflow = 1.3313 m³/s @ 12.25 hrs, Volume= 6.028 Ml
Primary = 1.3313 m³/s @ 12.25 hrs, Volume= 6.028 Ml, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : To Tailings Pond

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond 26P: Sump 2

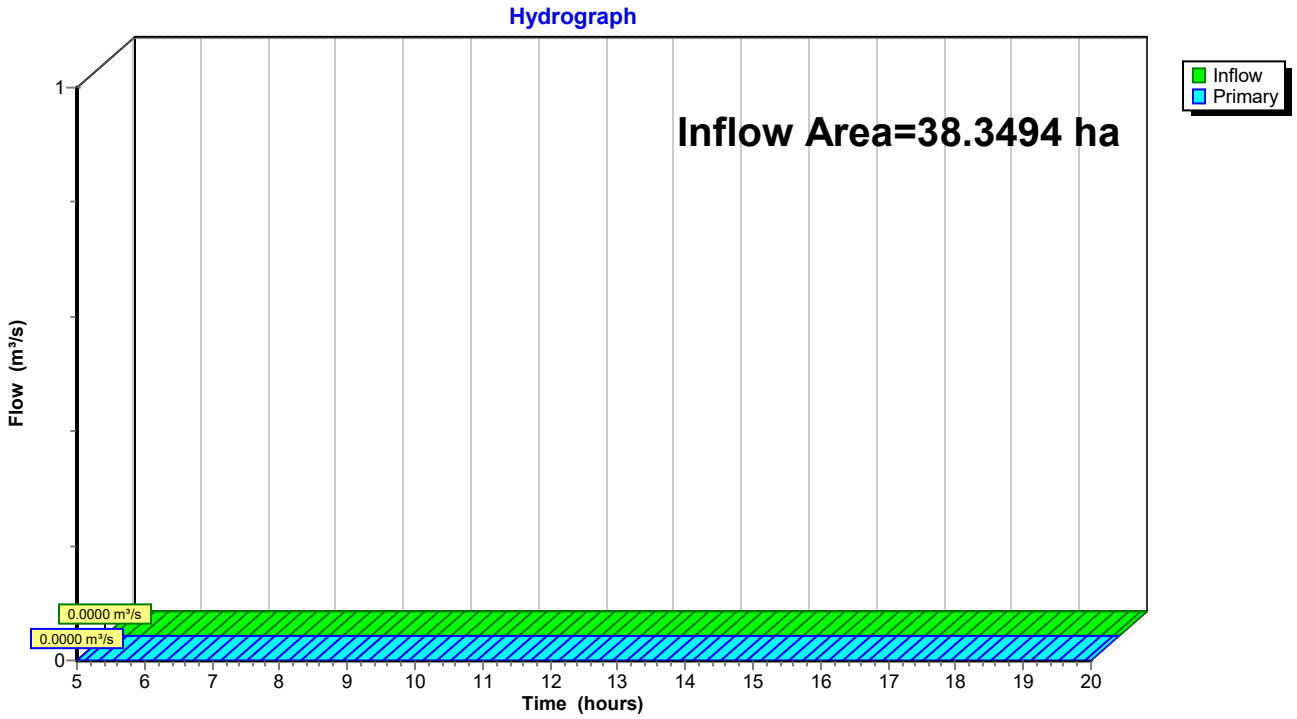


Summary for Link 1L: Outfall (To Effluent TP)

Inflow Area = 38.3494 ha, 78.87% Impervious, Inflow Depth = 0 mm for 100-year, 24-hour event
Inflow = 0.0000 m³/s @ 5.00 hrs, Volume= 0.000 Ml
Primary = 0.0000 m³/s @ 5.00 hrs, Volume= 0.000 Ml, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 1L: Outfall (To Effluent TP)

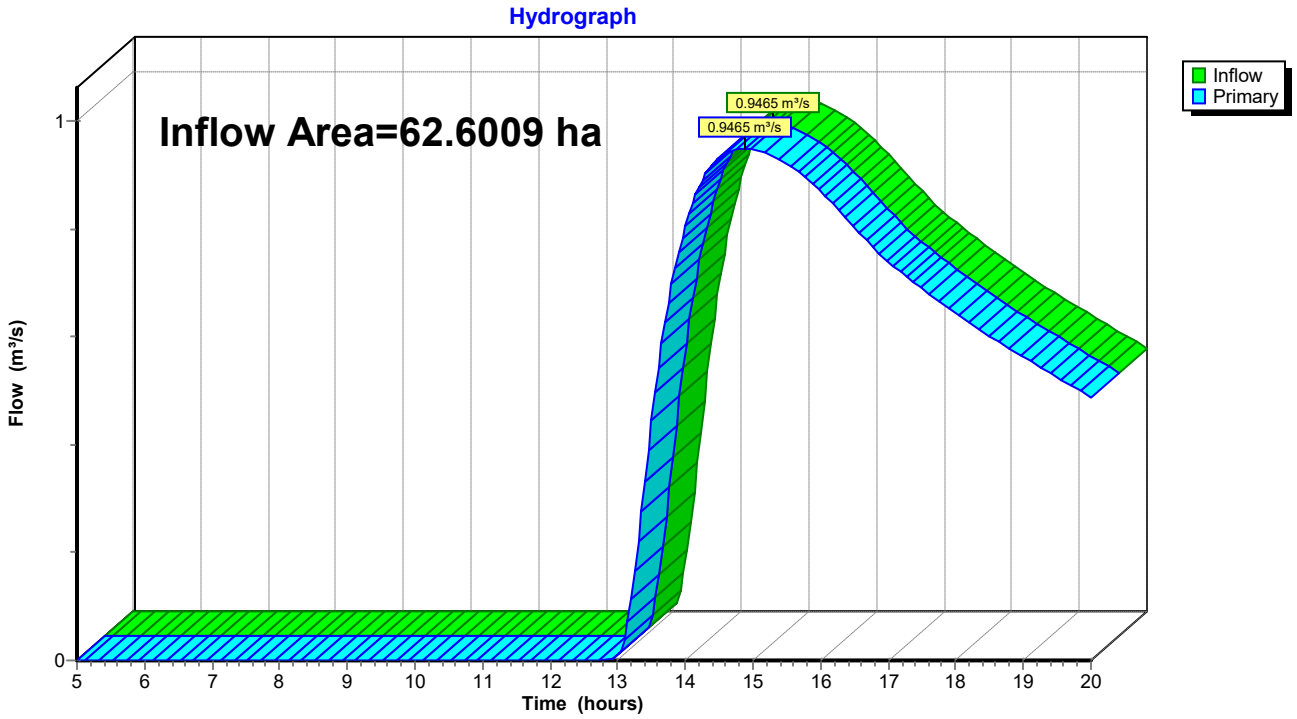


Summary for Link 3L: Outfall (To Existing Overland Flow)

Inflow Area = 62.6009 ha, 78.86% Impervious, Inflow Depth > 28 mm for 100-year, 24-hour event
Inflow = 0.9465 m³/s @ 14.89 hrs, Volume= 17.532 Ml
Primary = 0.9465 m³/s @ 14.89 hrs, Volume= 17.532 Ml, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 3L: Outfall (To Existing Overland Flow)

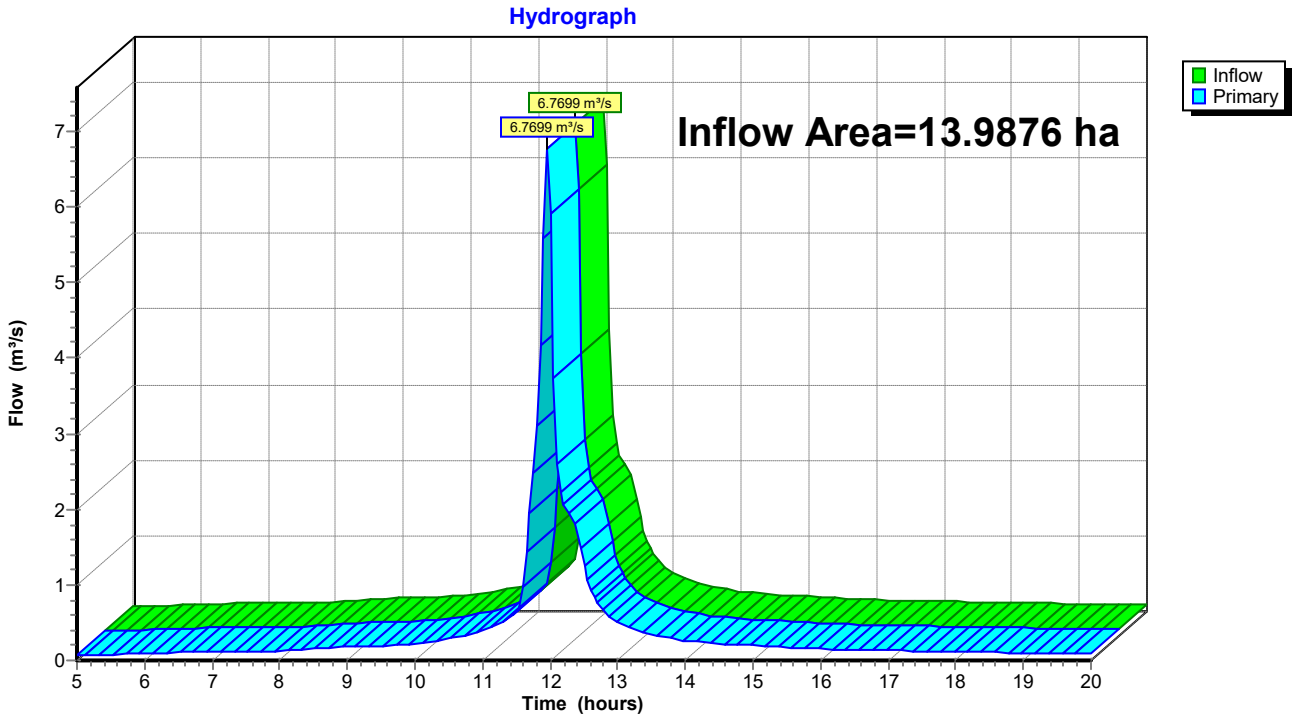


Summary for Link 4L: To Tailings Pond

Inflow Area = 13.9876 ha,100.00% Impervious, Inflow Depth > 141 mm for 100-year, 24-hour event
Inflow = 6.7699 m³/s @ 11.95 hrs, Volume= 19.731 Ml
Primary = 6.7699 m³/s @ 11.95 hrs, Volume= 19.731 Ml, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

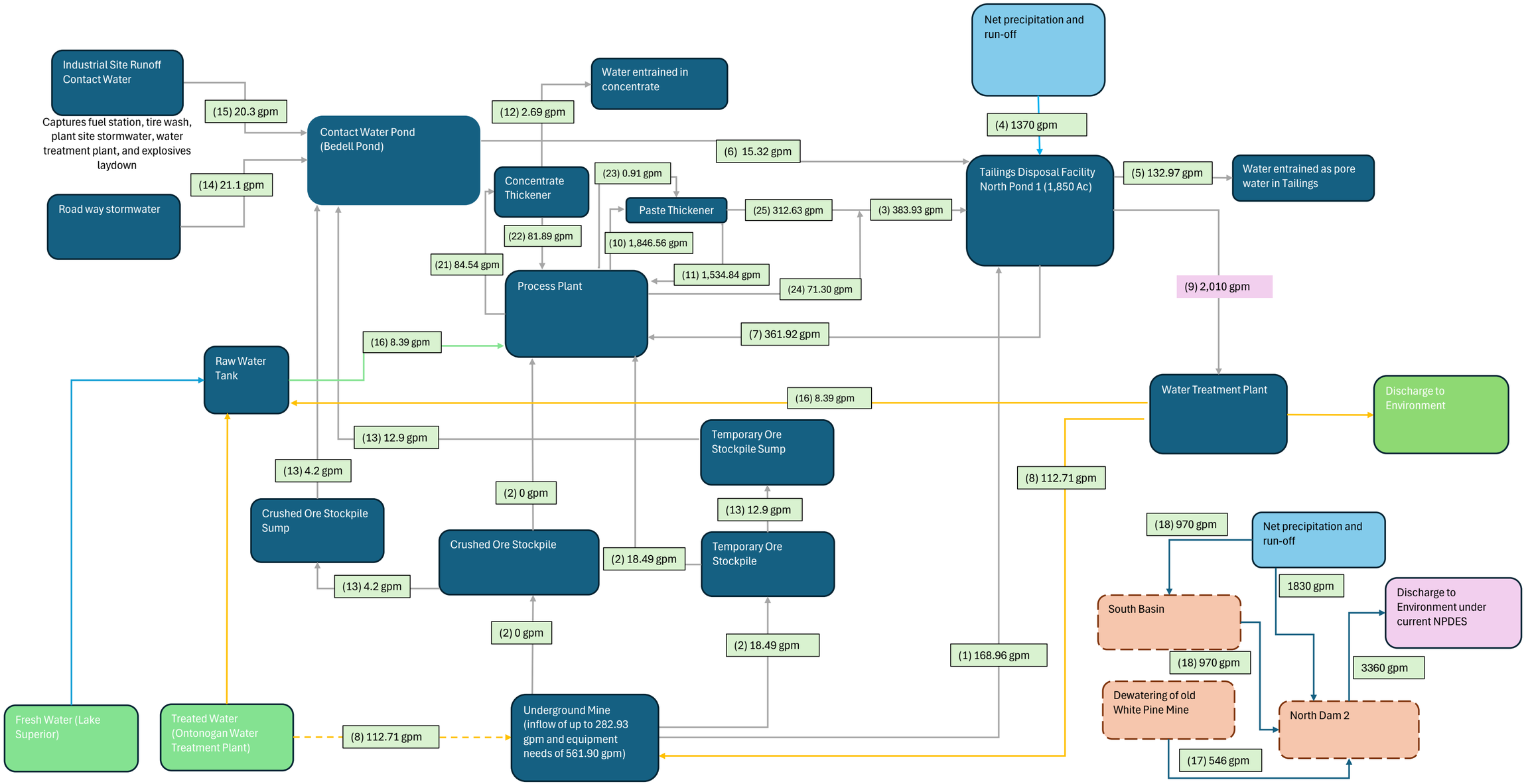
Link 4L: To Tailings Pond



Appendix B

GoldSim Water Balance Modeling Data – No Design Storm Events

Year 1 - Paste Thickened Tails



NOTES:

1. Cross reference descriptions listed on reference sheet.

FRESH WATER = water from Lake Superior

TREATED WATER = water from water treatment plant

RAW WATER = FRESH WATER + TREATED WATER

PROCESS WATER = untreated water, made up of recycled water from process streams (such as conc and thickener o/f, decant from TDF) and water from surface contact water sources

WHITE PINE COPPER LLC

FIGURE B-1

Operational Water Balance Year 1

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

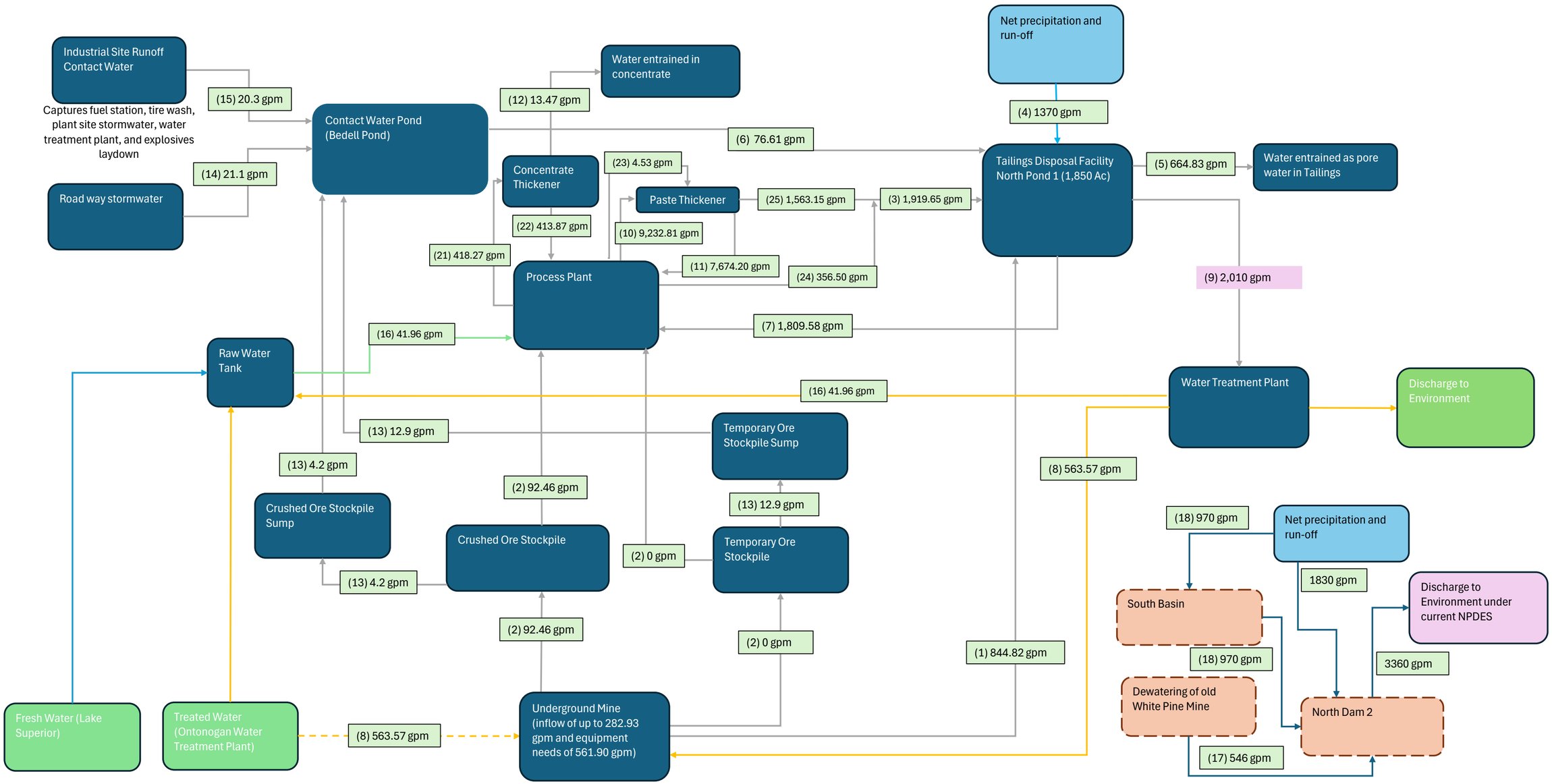
Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: BDS1	Project: 23W200

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Path: pw:\\Clients\White Pine Copper\23W200\10000 Reports\2026 Permitting Documents\MPA\Appendix D\D-3\Water Management Design\Appendix B - GoldSim Results with No Design Storm Events\Att 1 - WPC Operational Water Balance - Paste Tailings - 7.20.26_GPM.xlsx

Date: 8/20/2026

Year 11 - Paste Thickened Tails



NOTES:

1. Cross reference descriptions listed on reference sheet.

- FRESH WATER = water from Lake Superior
- TREATED WATER = water from water treatment plant
- RAW WATER = FRESH WATER + TREATED WATER
- PROCESS WATER = untreated water, made up of recycled water from process streams (such as conc and thickener o/f, decant from TDF) and water from surface contact water sources

Foth

WHITE PINE COPPER LLC

FIGURE B-2

Operational Water Balance Year 11

WHITE PINE NORTH

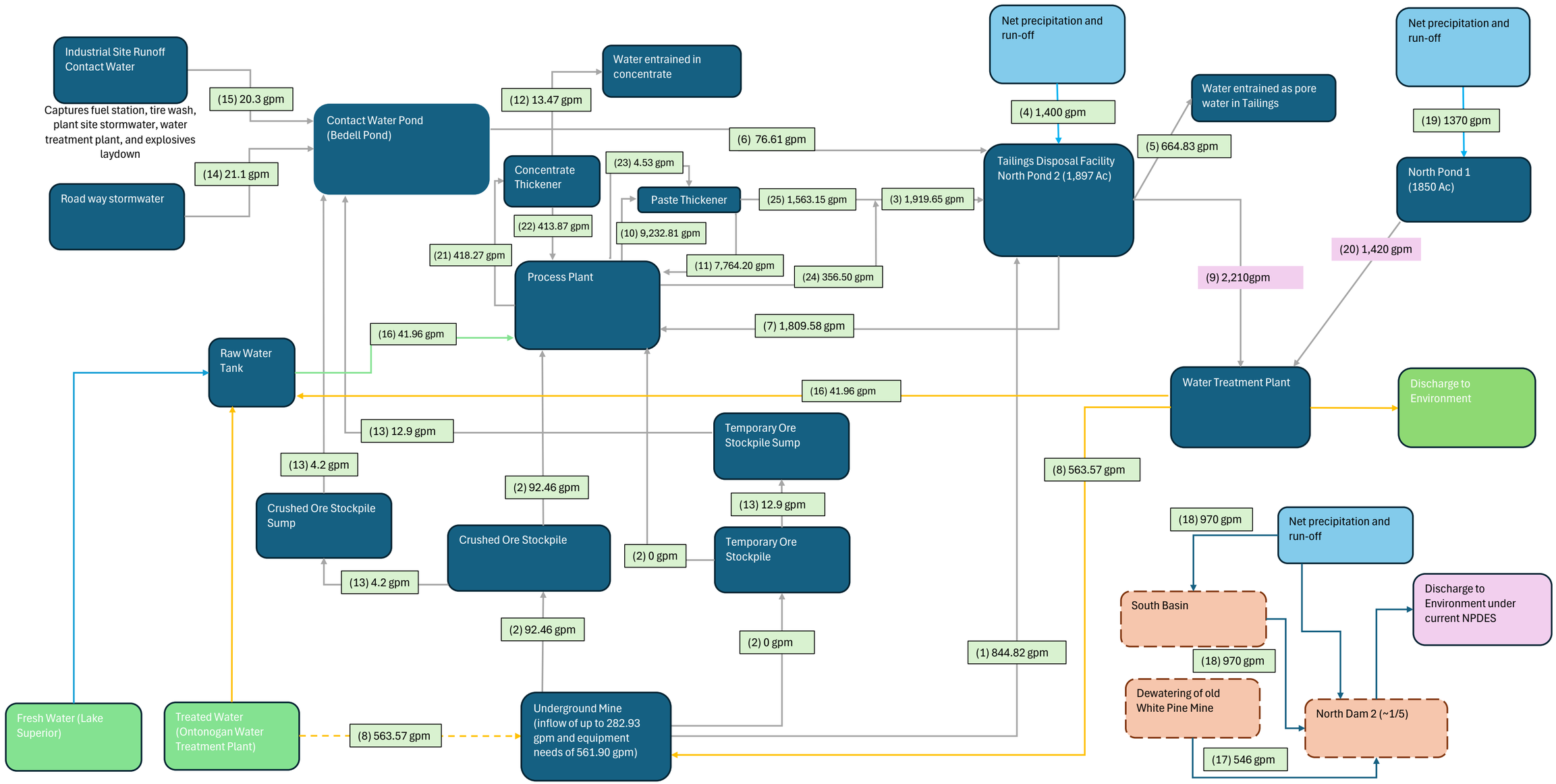
ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: BDS1	Project: 23W200

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Date: 8/20/2026

Year 12 - Paste Thickened Tails



NOTES:

1. Cross reference descriptions listed on reference sheet.

FRESH WATER = water from Lake Superior

TREATED WATER = water from water treatment plant

RAW WATER = FRESH WATER + TREATED WATER

PROCESS WATER = untreated water, made up of recycled water from process streams (such as conc and thickener o/f, decant from TDF) and water from surface contact water sources

Foth

WHITE PINE COPPER LLC

FIGURE B-3

Operational Water Balance Year 12

WHITE PINE NORTH

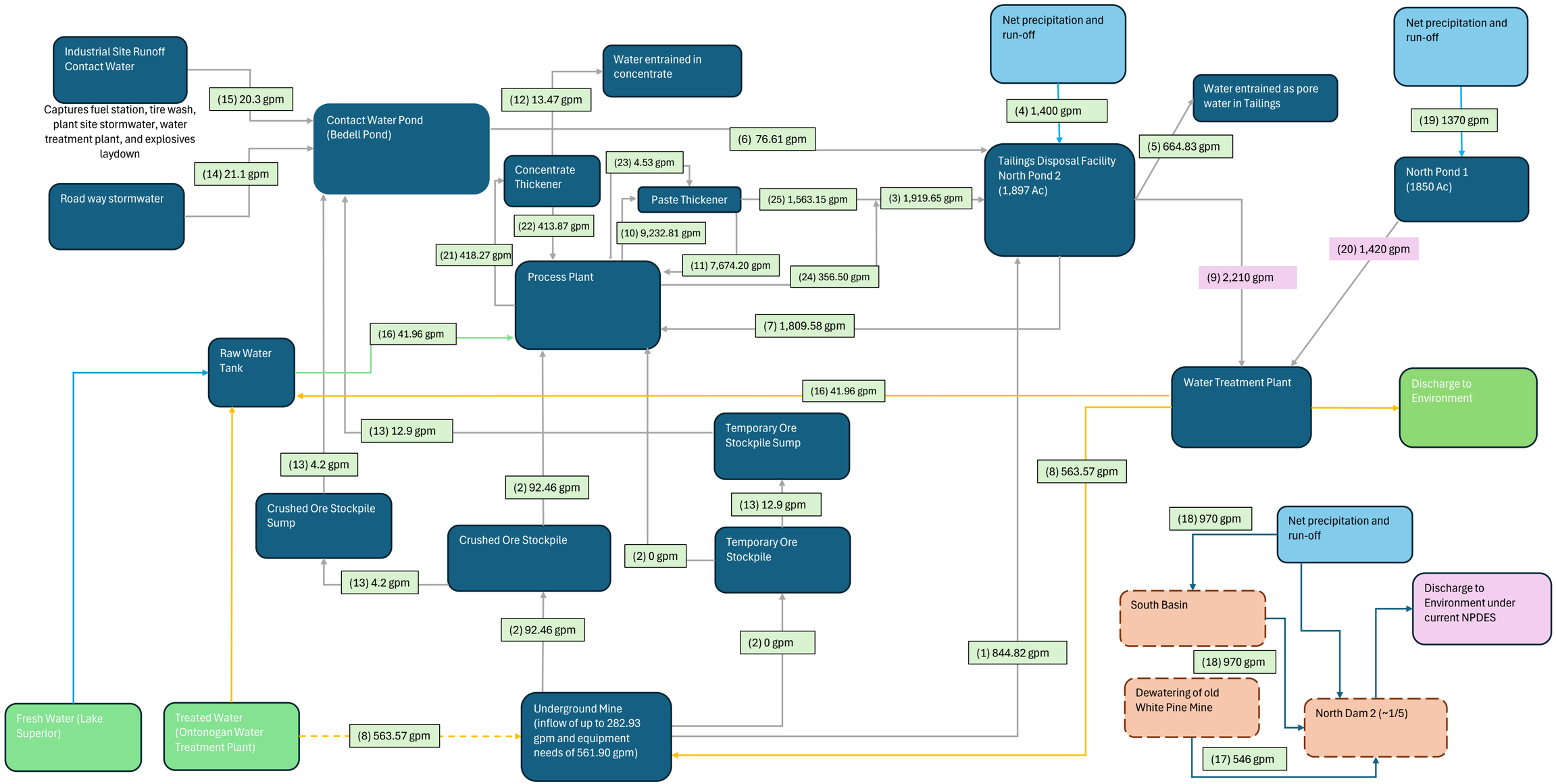
ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: BDS1	Project: 23W200

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Date: 8/20/2026

Year 26 - Paste Thickened Tails



NOTES:

1. Cross reference descriptions listed on reference sheet.

FRESH WATER = water from Lake Superior

TREATED WATER = water from water treatment plant

RAW WATER = FRESH WATER + TREATED WATER

PROCESS WATER = untreated water, made up of recycled water from process streams (such as conc and thickener o/f, decant from TDF) and water from surface contact water sources

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FIGURE B-4

Operational Water Balance Year 26

WHITE PINE NORTH

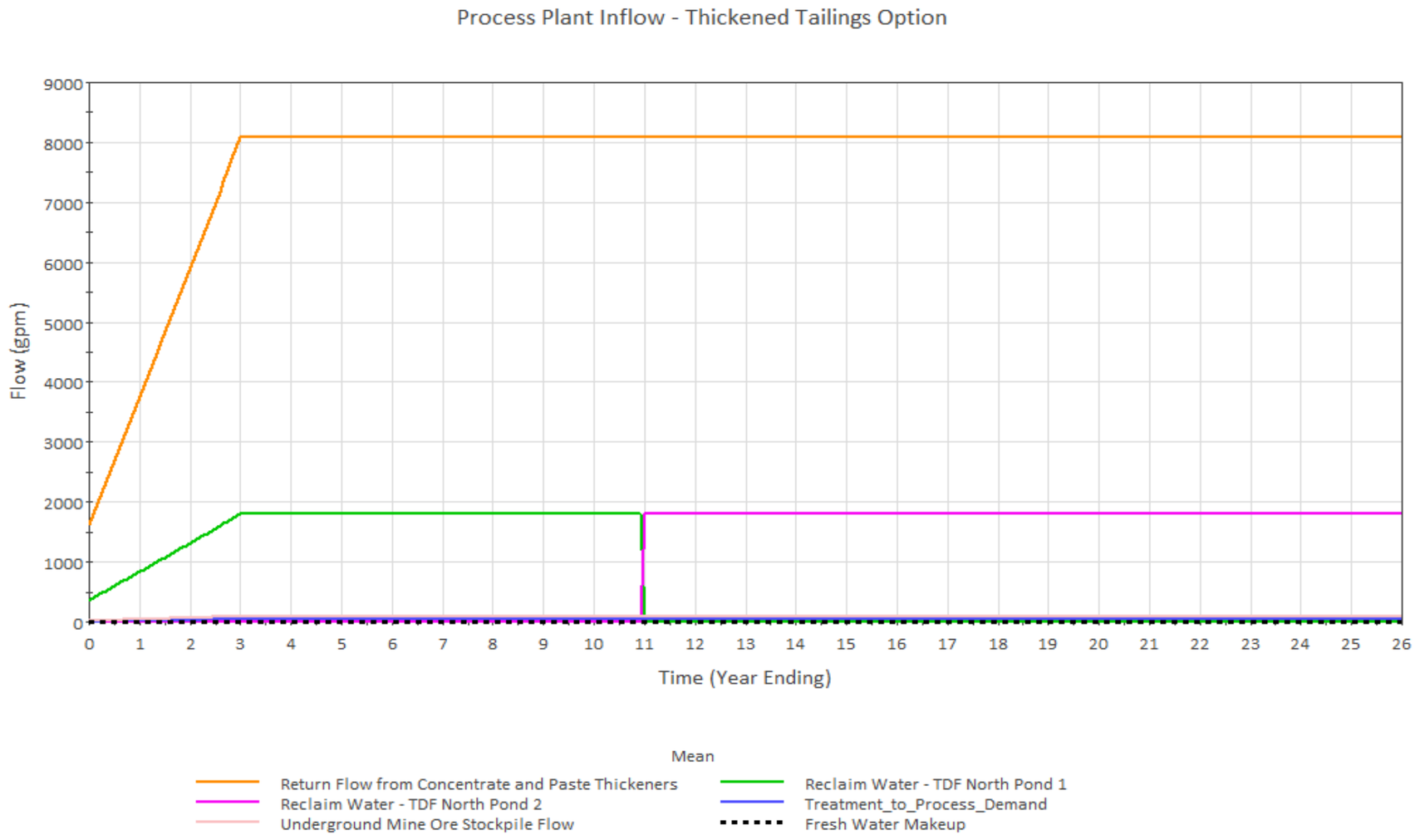
ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: BDS1	Project: 23W200

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Date: 8/20/2026



NOTES:

1. Assumptions made for developing preliminary flow estimates include:
   - -Site runoff/contact water and waste rock stockpile runoff water drain to Bedel Pond and do not enter the TDF.
   - -Evaporation within both the TDF pond water and TDF dry ground areas is assumed to occur at an average open water evaporation rate of 23 to 25 inches per year based on the climate change model.
   - -TDF NP1 has a surface water drainage area of ~1850 Ac., a combined reclaimed water/stormwater detention pond area of ~274 Ac., and a capacity of ~2164 Ac-ft.
   - -TDF NP2 Reclaim Area has a surface water drainage area of ~1897 Ac., a reclaimed water pond area of ~105 Ac., and a capacity of ~2169 Ac-ft.
   - -TDF capacities are taken at 2% Deposition slope from Table 4 of the 2/17/26 TetraTech Memo regarding *Water Management Philosophy of Operating and Design Storm Conditions.*
   - -The initial quantity in both NP1 and NP2 is assumed to be 1/3 the total capacity.
   - -Results represent monthly averages over 1000 simulations.

Foth

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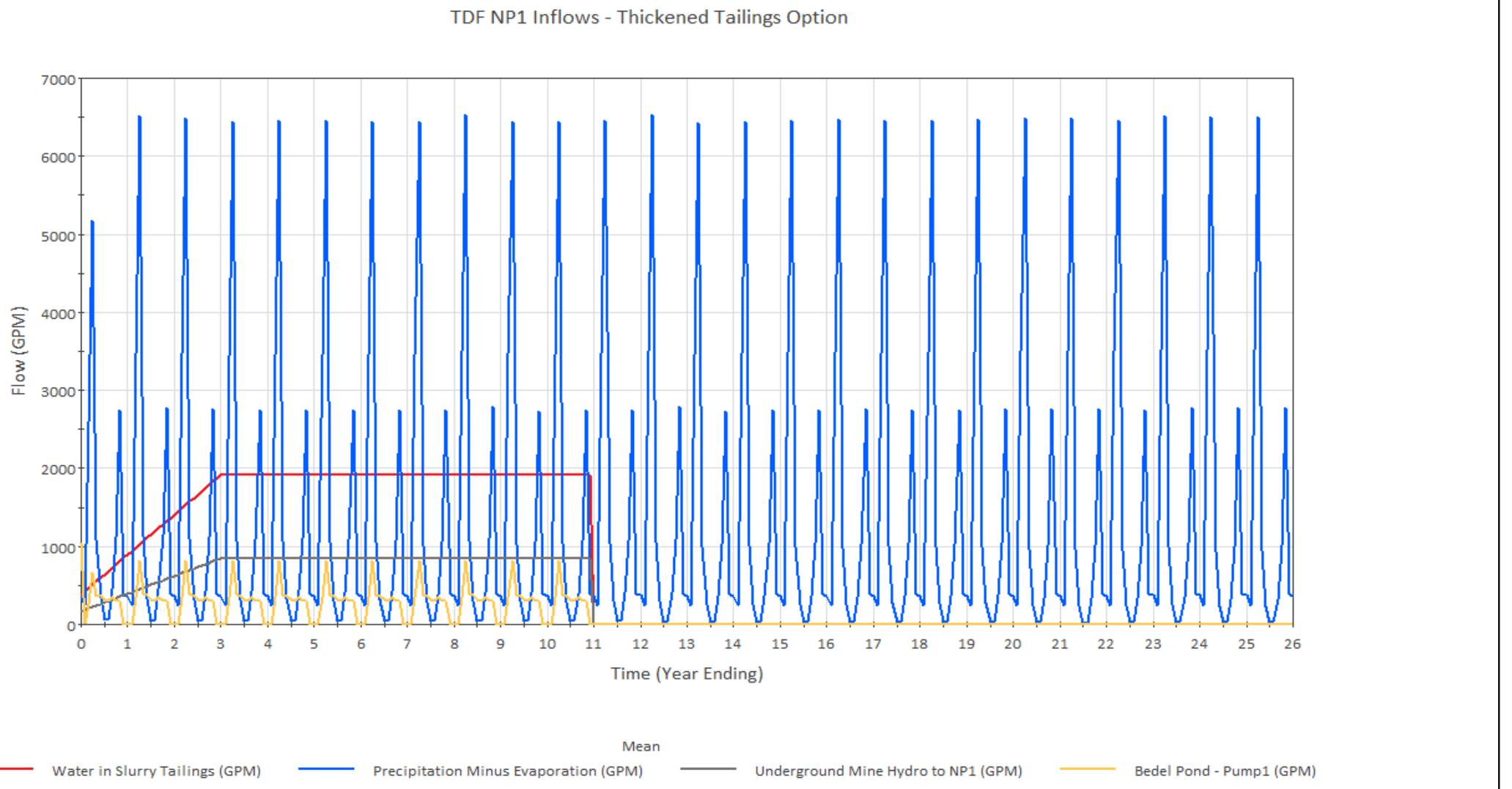
FIGURE B-5

PROCESS PLANT INFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

1. Assumptions made for developing preliminary flow estimates include:
   - -Site runoff/contact water and waste rock stockpile runoff water drain to Bedel Pond and do not enter the TDF.
   - -Evaporation within both the TDF pond water and TDF dry ground areas is assumed to occur at an average open water evaporation rate of 23 to 25 inches per year based on the climate change model.
   - -TDF NP1 has a surface water drainage area of ~1850 Ac., a combined reclaimed water/stormwater detention pond area of ~274 Ac., and a capacity of ~2164 Ac-ft.
   - -TDF capacities are taken at 2% Deposition slope from Table 4 of the 2/17/26 TetraTech Memo regarding *Water Management Philosophy of Operating and Design Storm Conditions.*
   - -The initial quantity in NP1 is assumed to be 1/3 the total capacity.
   - -Results represent monthly averages over 1000 simulations.

WHITE PINE COPPER LLC

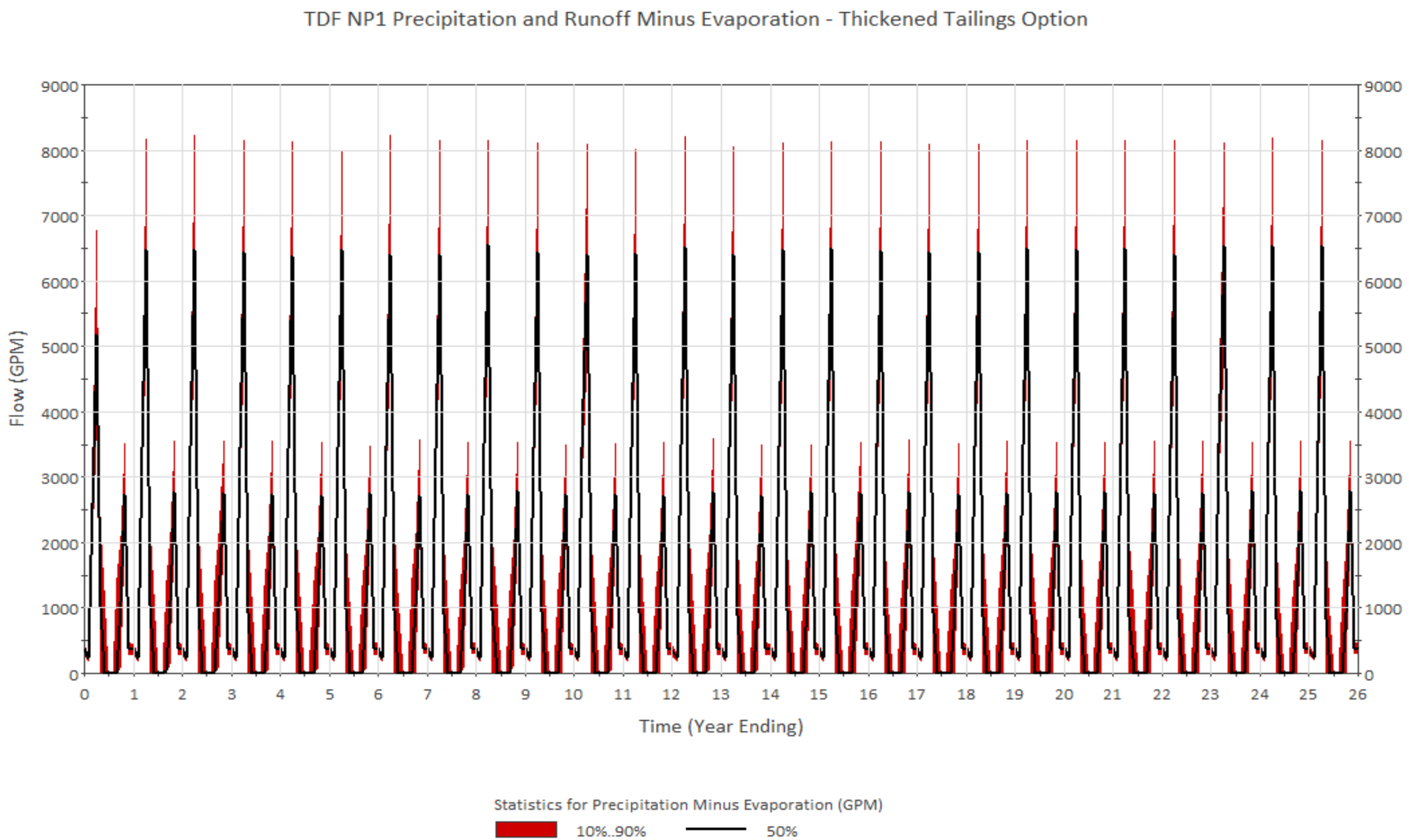
FIGURE B-6

TDF NORTH POND 1 INFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

1. Assumptions made for developing preliminary flow estimates include:
   - -Site runoff/contact water and waste rock stockpile runoff water drain to Bedel Pond and do not enter the TDF.
   - -Evaporation within both the TDF pond water and TDF dry ground areas is assumed to occur at an average open water evaporation rate of 23 to 25 inches per year based on the climate change model.
   - -TDF NP1 has a surface water drainage area of ~1850 Ac., a combined reclaimed water/stormwater detention pond area of ~274 Ac., and a capacity of ~2164 Ac-ft.
   - -TDF capacities are taken at 2% Deposition slope from Table 4 of the 2/17/26 TetraTech Memo regarding *Water Management Philosophy of Operating and Design Storm Conditions.*
   - -The initial quantity in NP1 is assumed to be 1/3 the total capacity.
   - -Results represent monthly averages over 1000 simulations.

WHITE PINE COPPER LLC

FIGURE B-6a

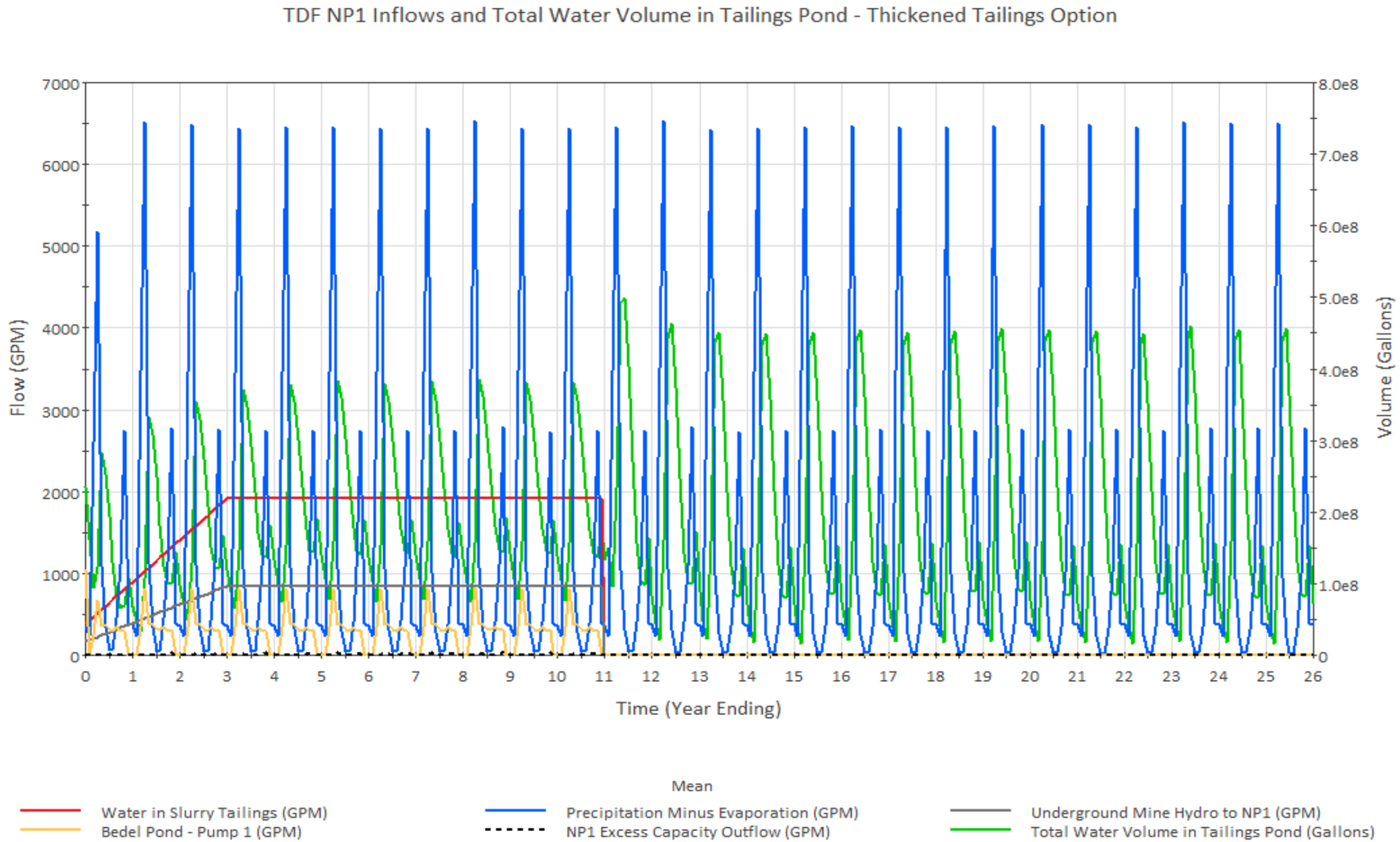
TDF NORTH POND 1 NET PRECIP P10 AND P90

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200

Foth



NOTES:

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   - -Results represent monthly averages over 1000 simulations.

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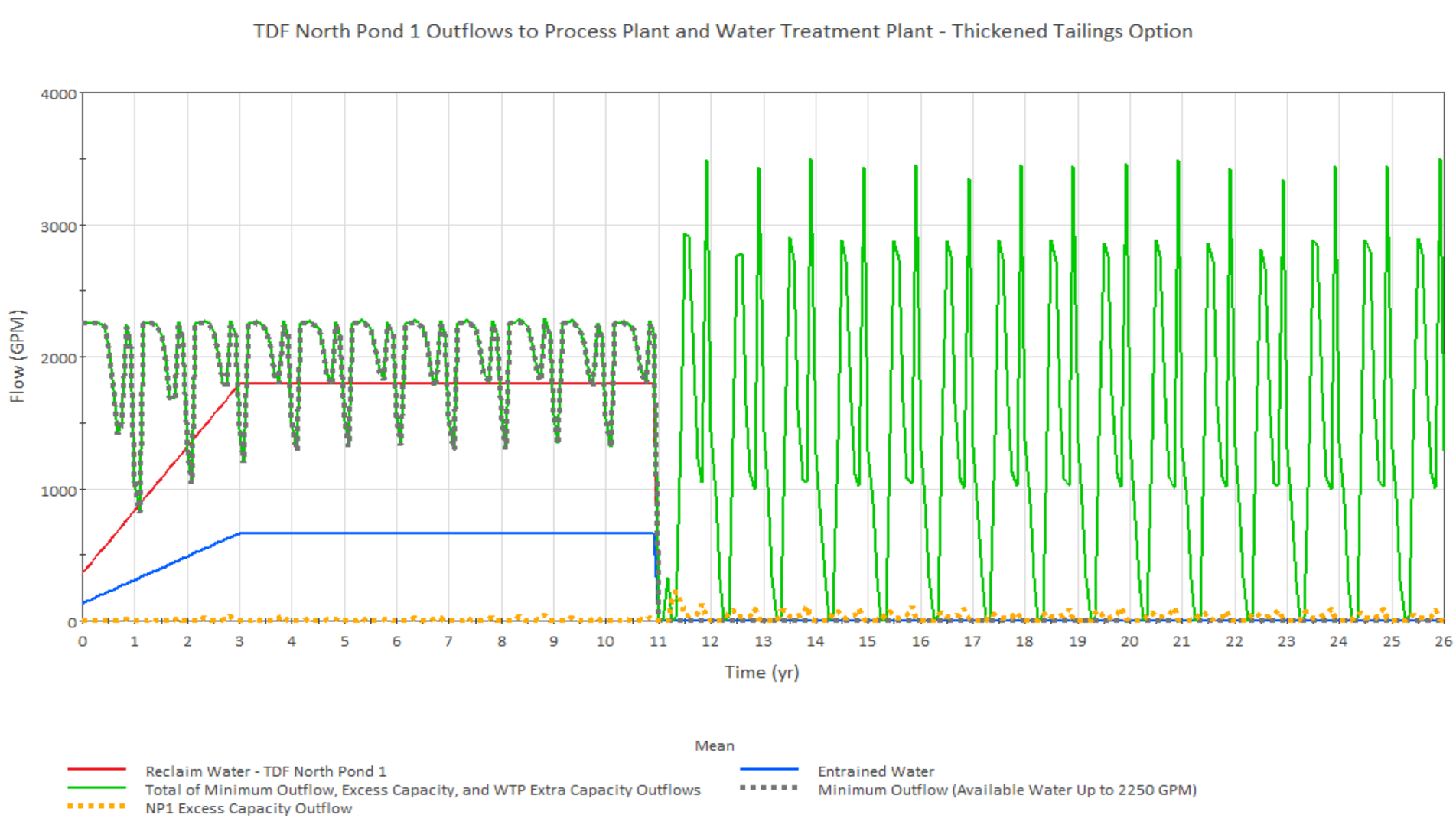
FIGURE B-6b

TDF NORTH POND 1 INFLOWS WITH TOTAL VOLUME

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200

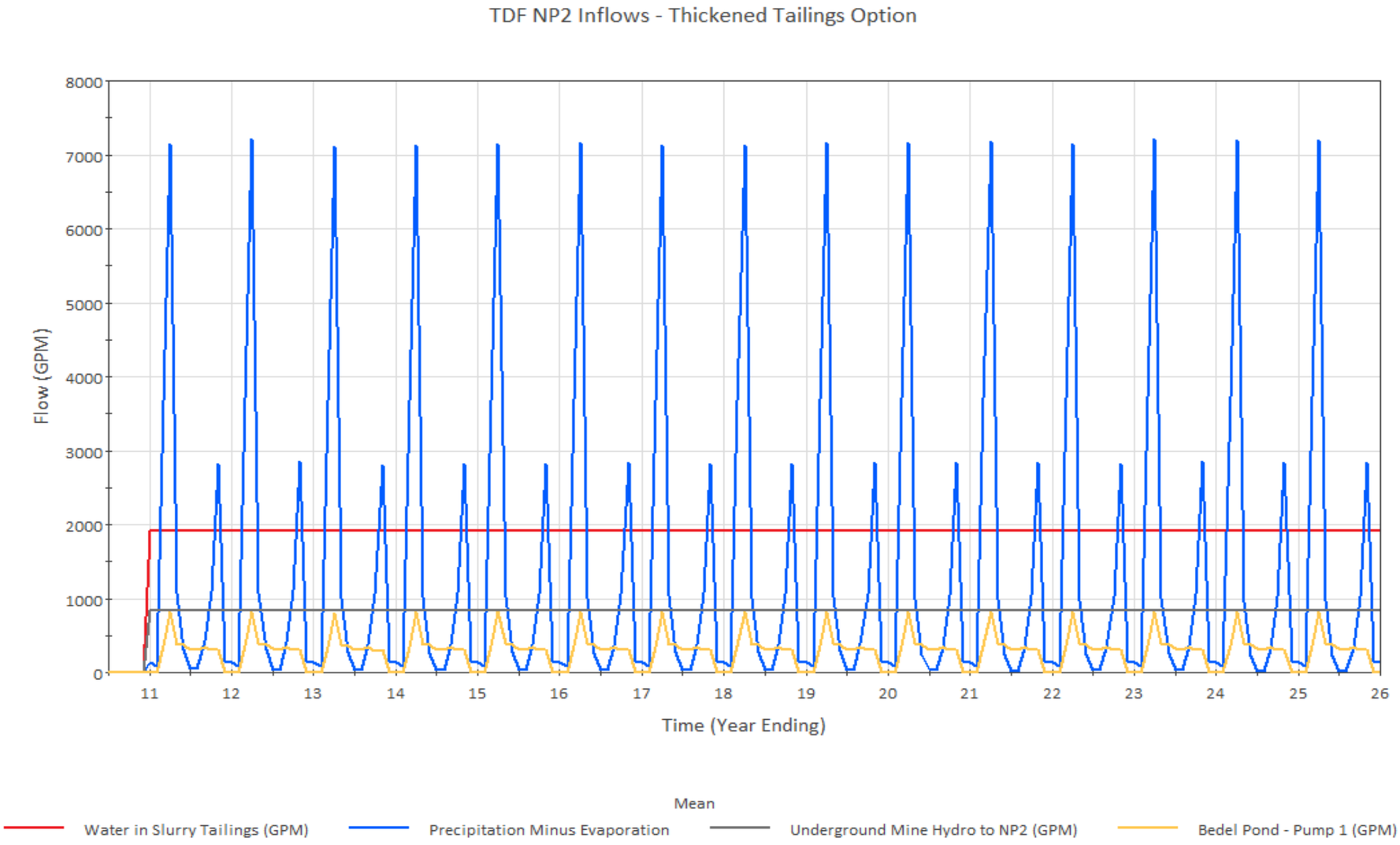


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Foth

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FIGURE B-7 **TDF NORTH POND 1 OUTFLOWS** WHITE PINE NORTH ONTONAGON COUNTY, MICHIGAN		
Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



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   - -TDF capacities are taken at 2% Deposition slope from Table 4 of the 2/17/26 TetraTech Memo regarding Water Management Philosophy of Operating and Design Storm Conditions.
   - -The initial quantity in NP2 is assumed to be 1/3 the total capacity.
   - -Results represent monthly averages over 1000 simulations.

Foth

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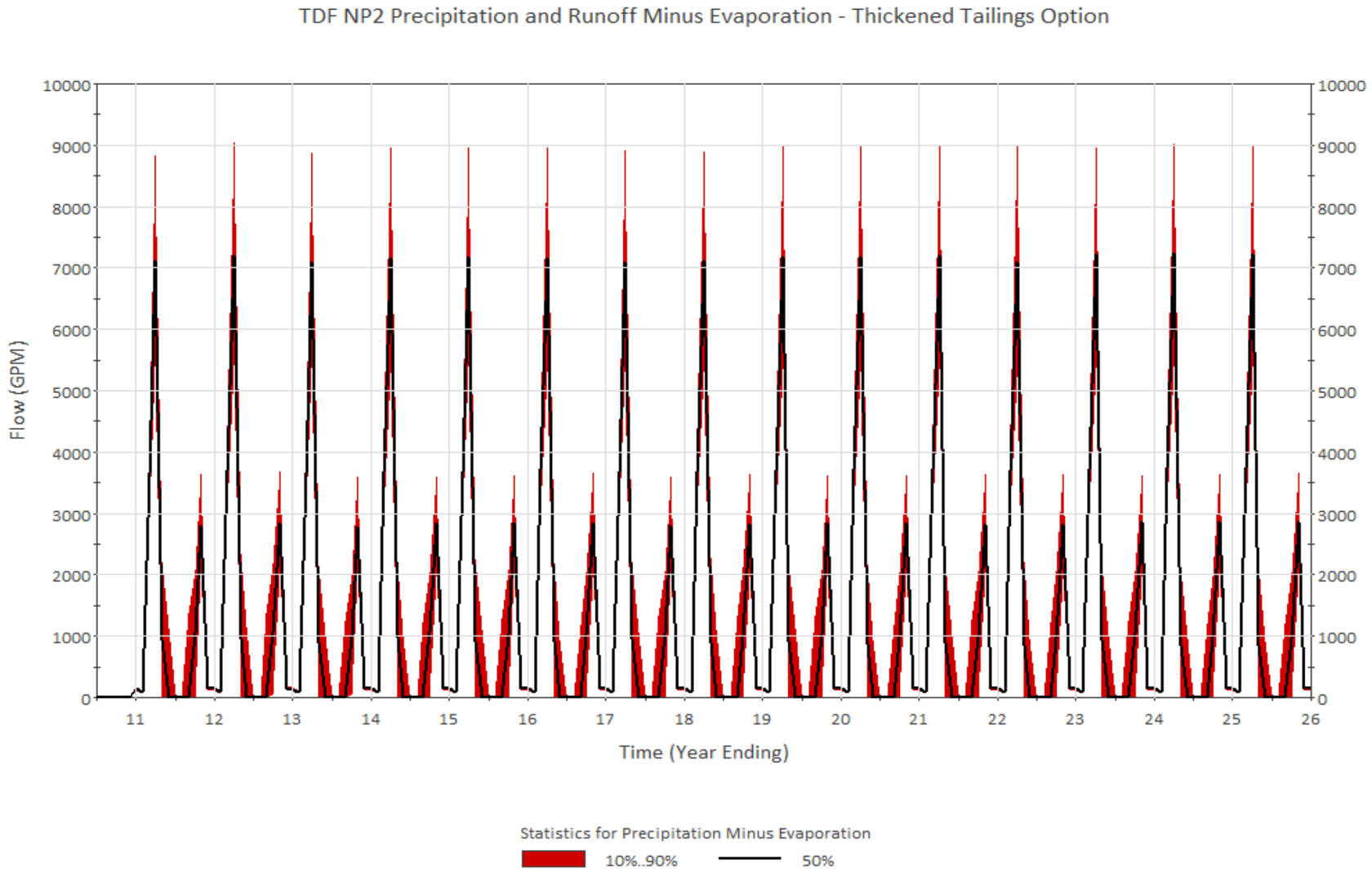
FIGURE B-8

TDF NORTH POND 2 INFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

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   - -Results represent monthly averages over 1000 simulations.

Foth

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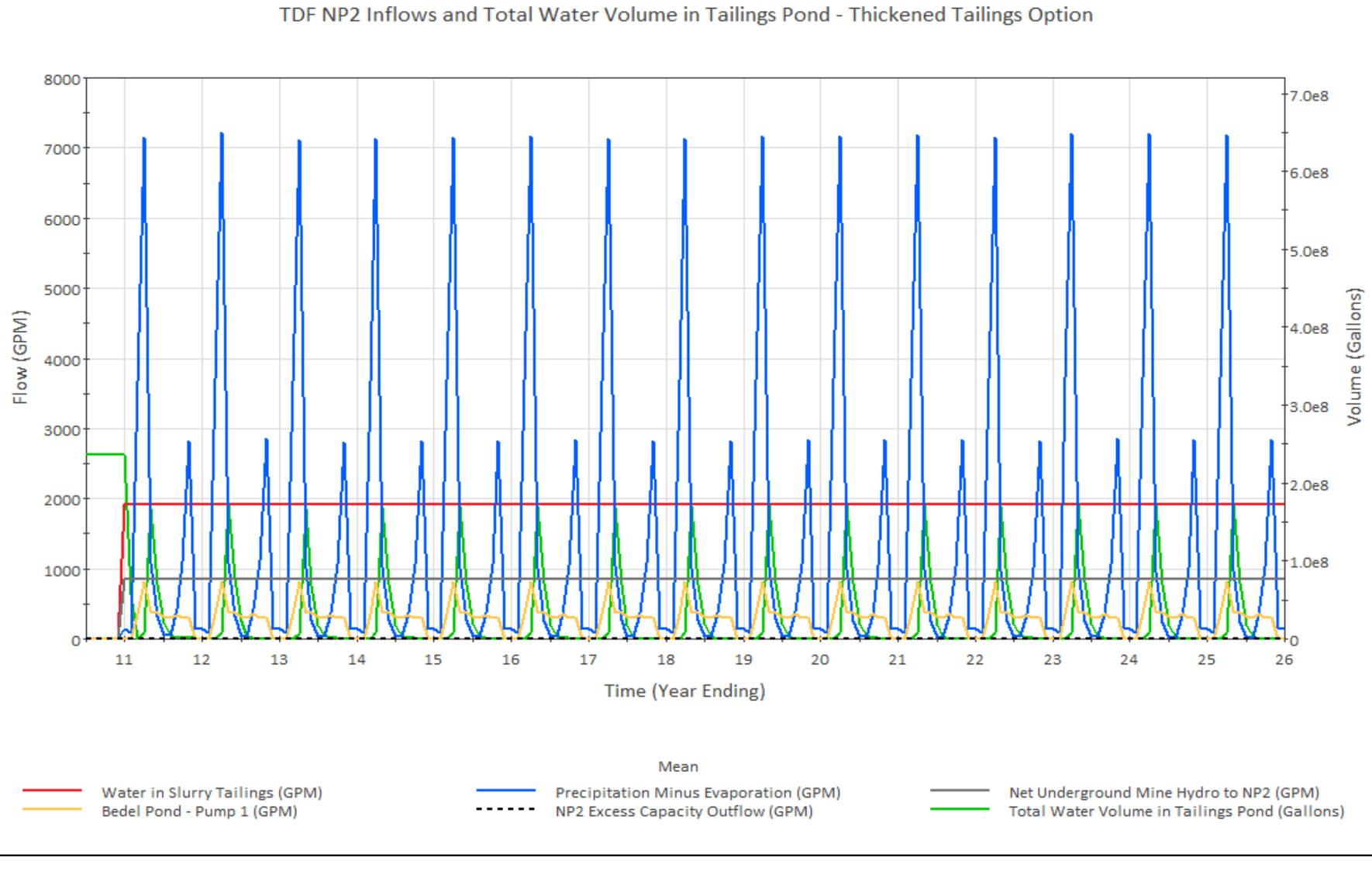
FIGURE B-8a

TDF NORTH POND 2 NET PRECIP P10 AND P90

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

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   -Total water volume refers to the total water in NP2 from precipitation and runoff plus total water in slurry tailings (excluding the water entrained as pore water in tailings).
   -Results represent monthly averages over 1000 simulations.

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FIGURE B-8b

TDF NORTH POND 2 INFLOWS WITH TOTAL VOLUME

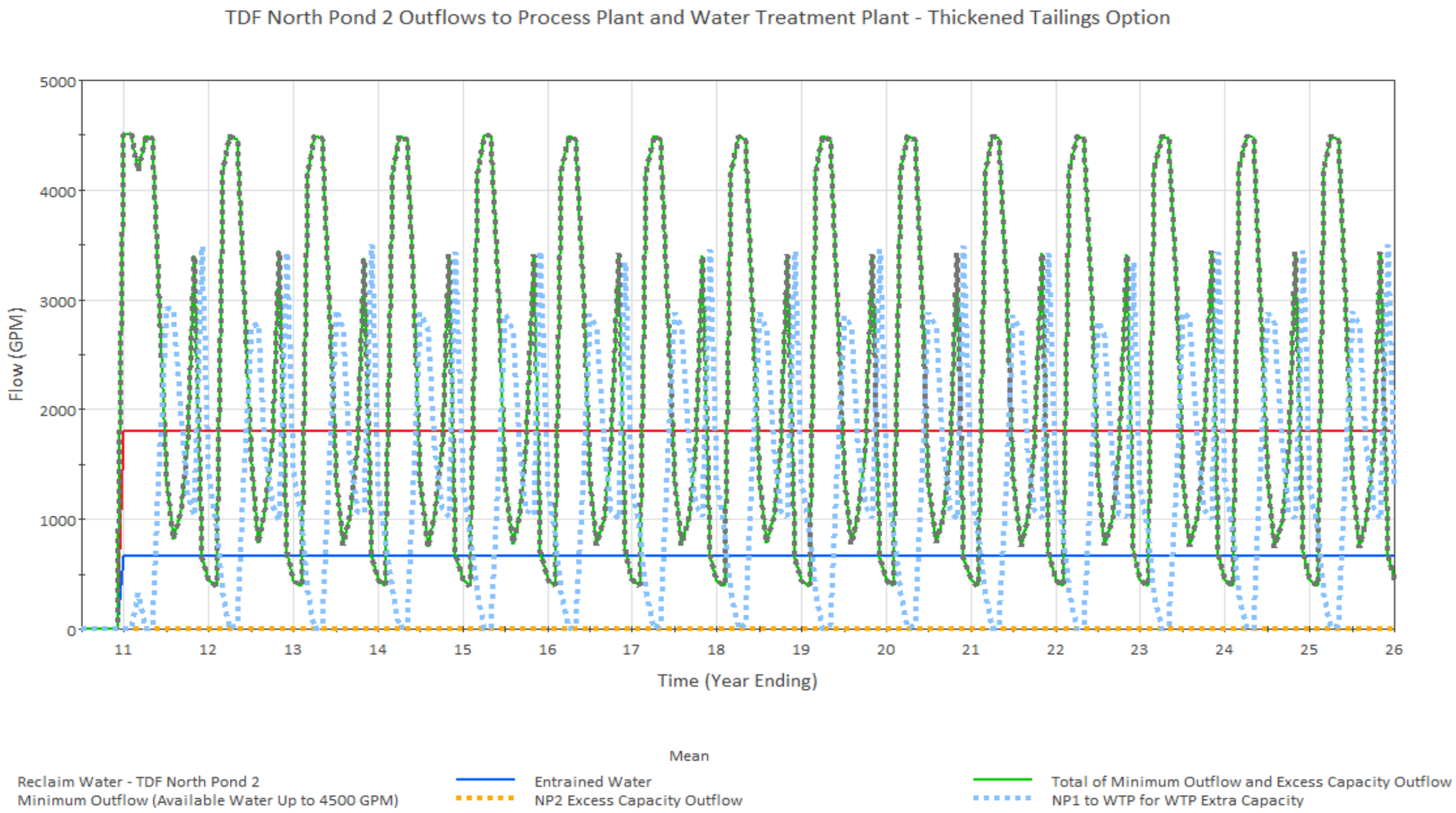
WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200

Path: pw:\\Clients\White Pine Copper\23W200\10000 Reports\2026 Permitting Documents\MPA\Appendix D\D-3\Water Management Design\Appendix B - GoldSim Results with No Design Storm Events\Att 2 - Prelim GoldSim Figures_2026_01_wo_NP1Transfer_minWTP2250_2026_07.xlsx

Date: 8/20/2026



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Foth

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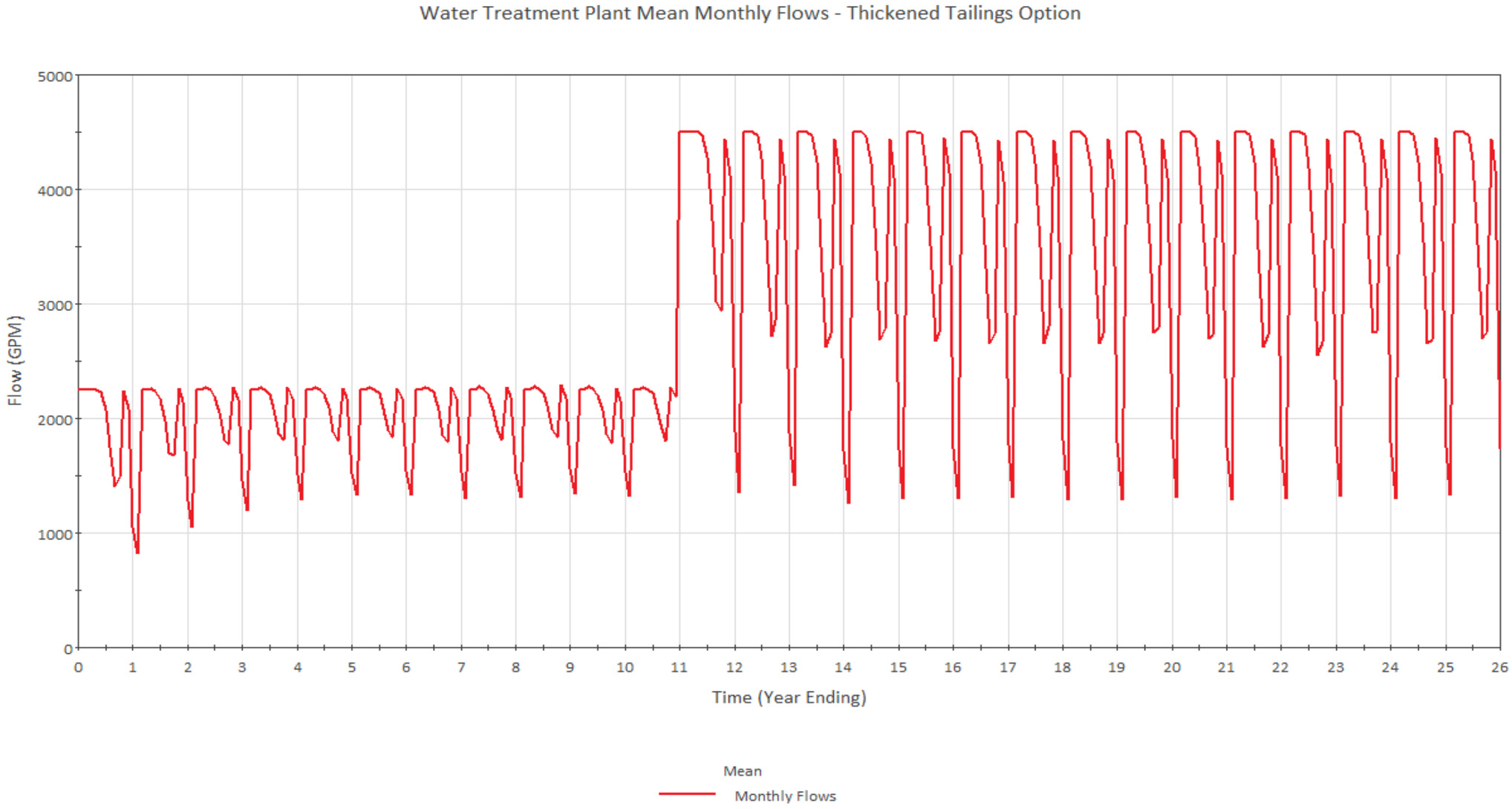
FIGURE B-9

TDF NORTH POND 2 OUTFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

1. Assumptions made for developing preliminary flow estimates include:
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Foth

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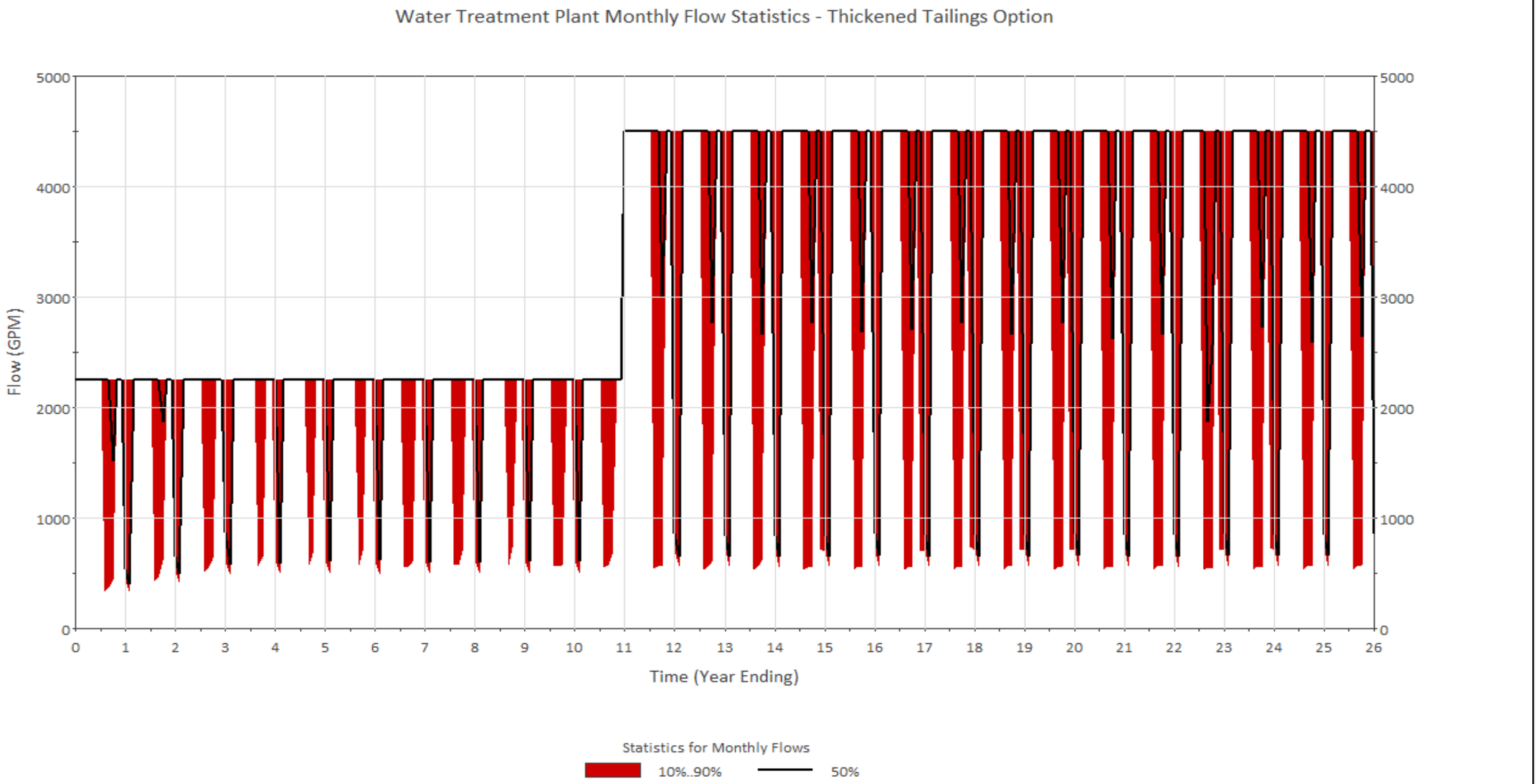
FIGURE B-10

WATER TREATMENT PLANT INFLOW - AVERAGE

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



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Foth

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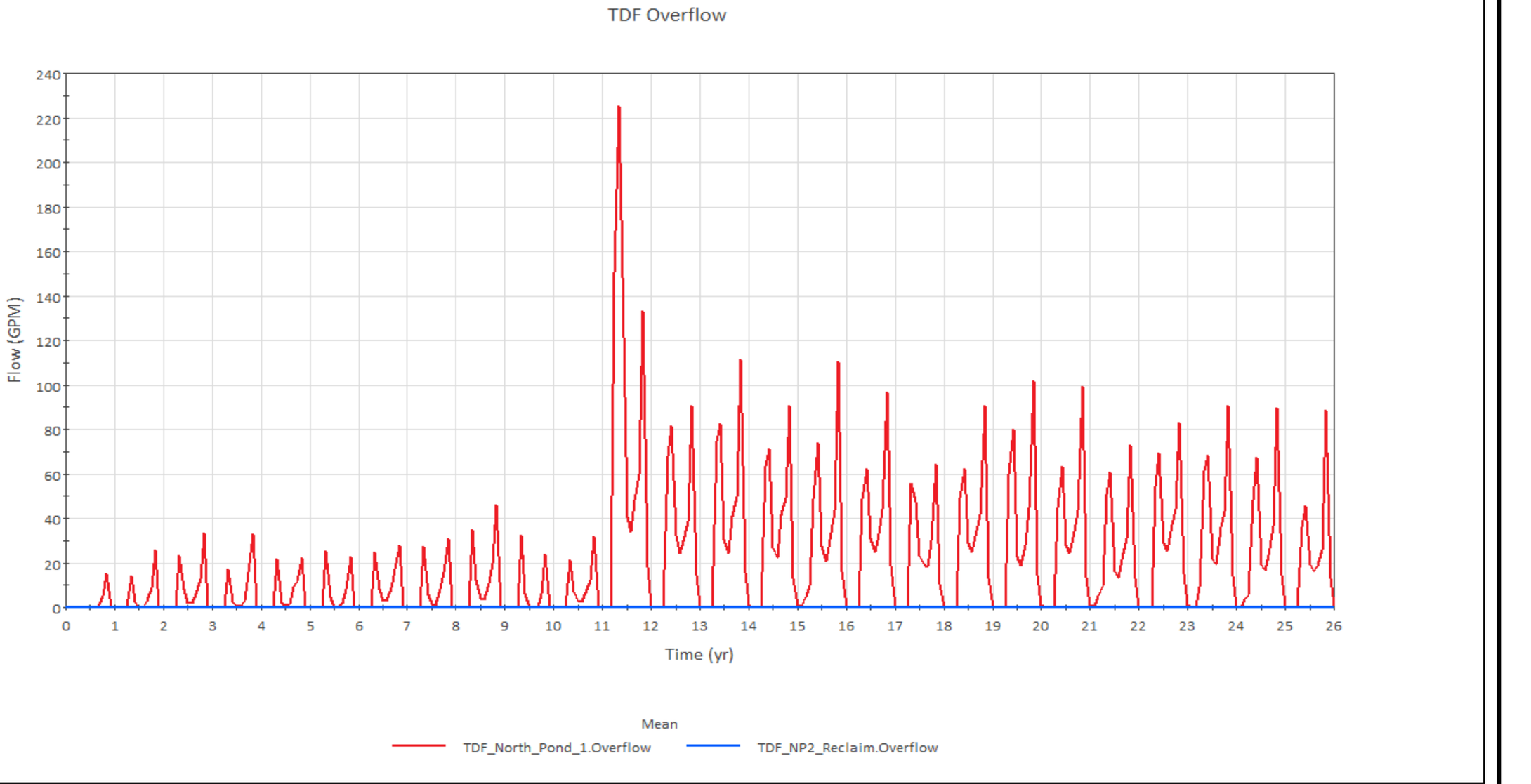
FIGURE B-10a

WATER TREATMENT PLANT INFLOW - P10, P50 AND P90

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



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FIGURE B-11

TDF NP1 AND NP2 EXTRA CAPACITY OUTFLOWS

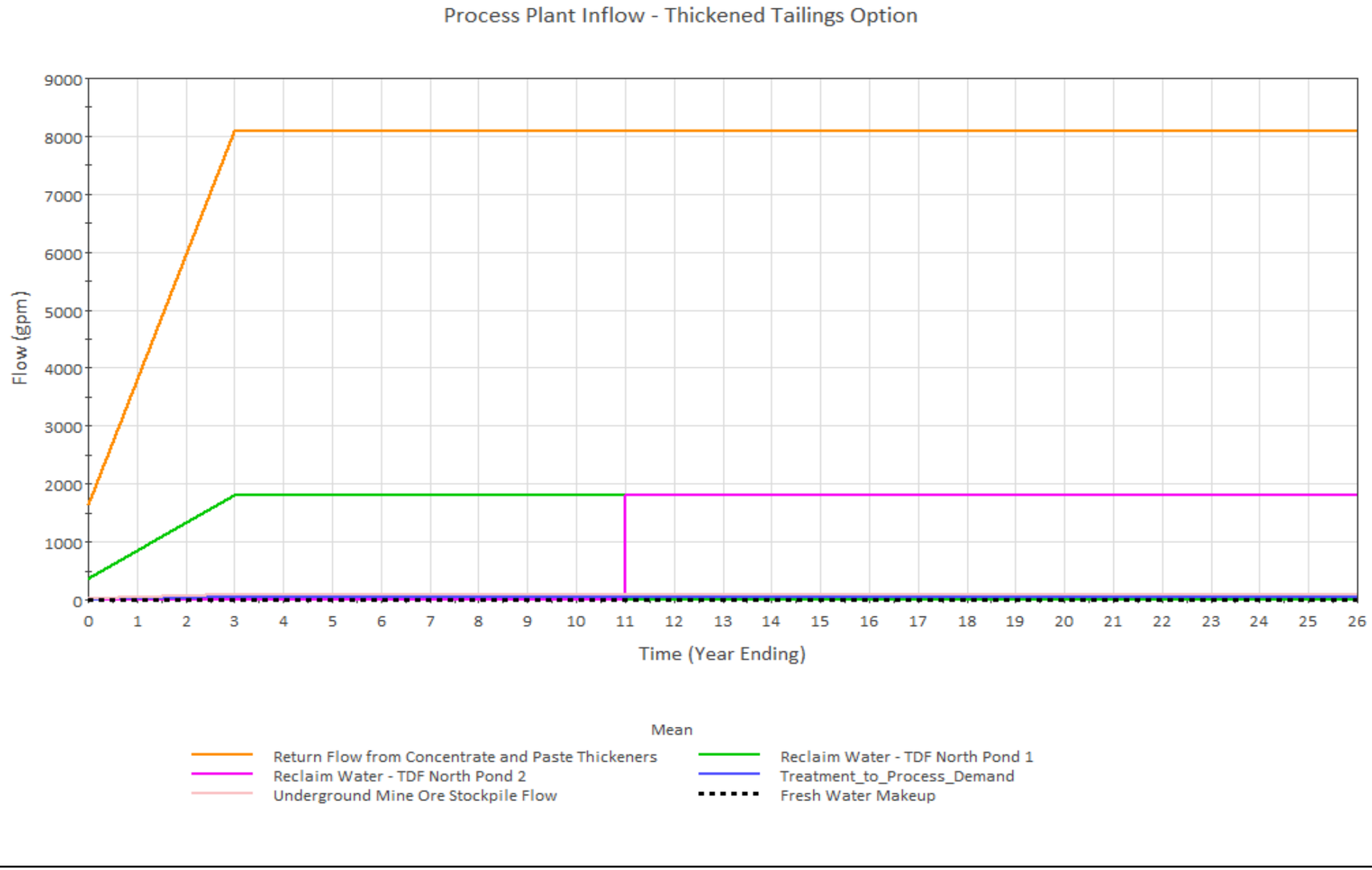
WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200

Appendix C

GoldSim Water Balance Modeling Data – Two Design Storm Events



NOTES:

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   -The initial quantity in both NP1 and NP2 is assumed to be 1/3 the total capacity.
   -Results represent daily averages over 1000 simulations.

2. A 24-hour storm event of 6.34" of precipitation is assumed for May 1 in Year 8 and August 1 in Year 15.

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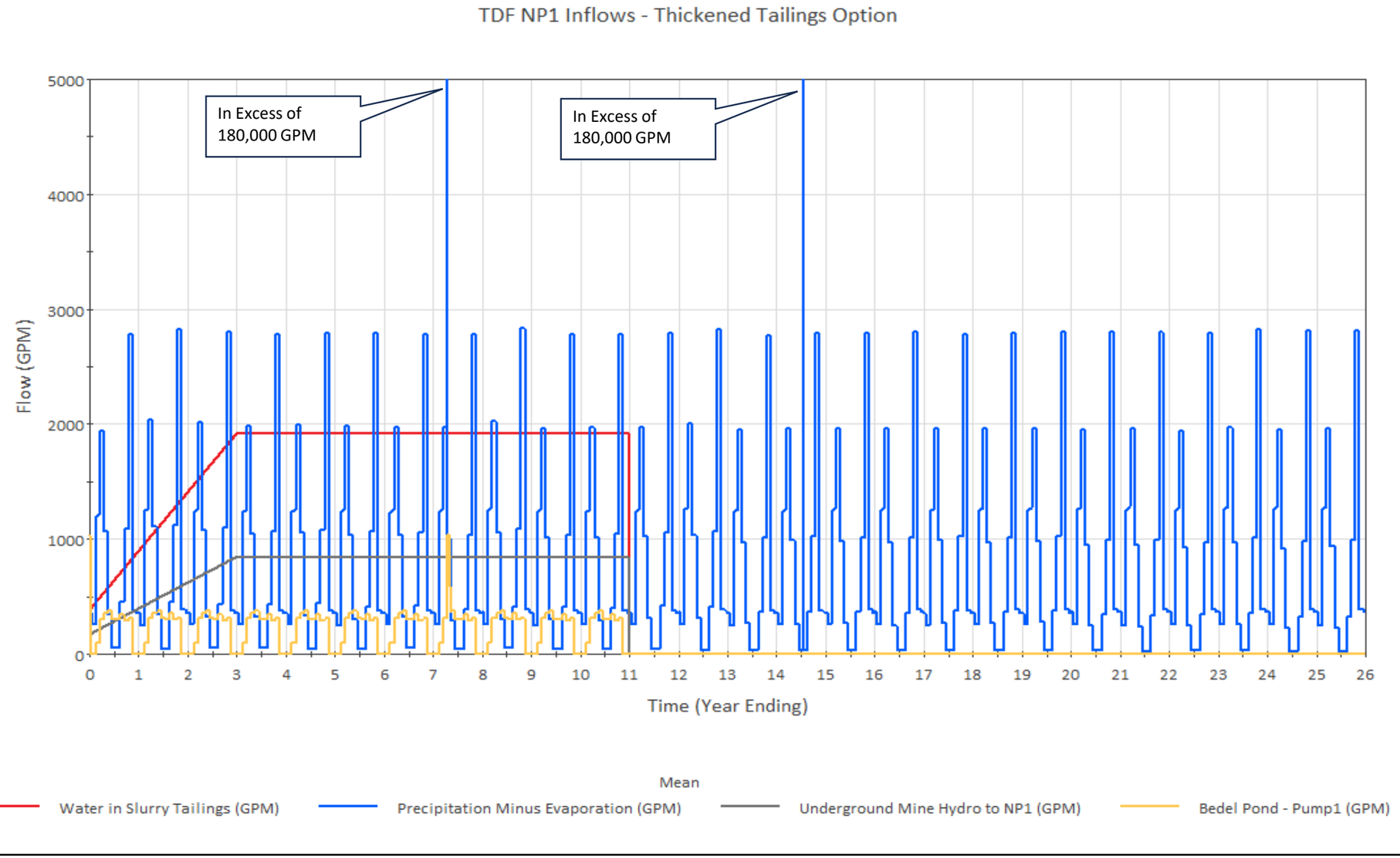
FIGURE C-1

PROCESS PLANT INFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



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Foth

WHITE PINE COPPER LLC

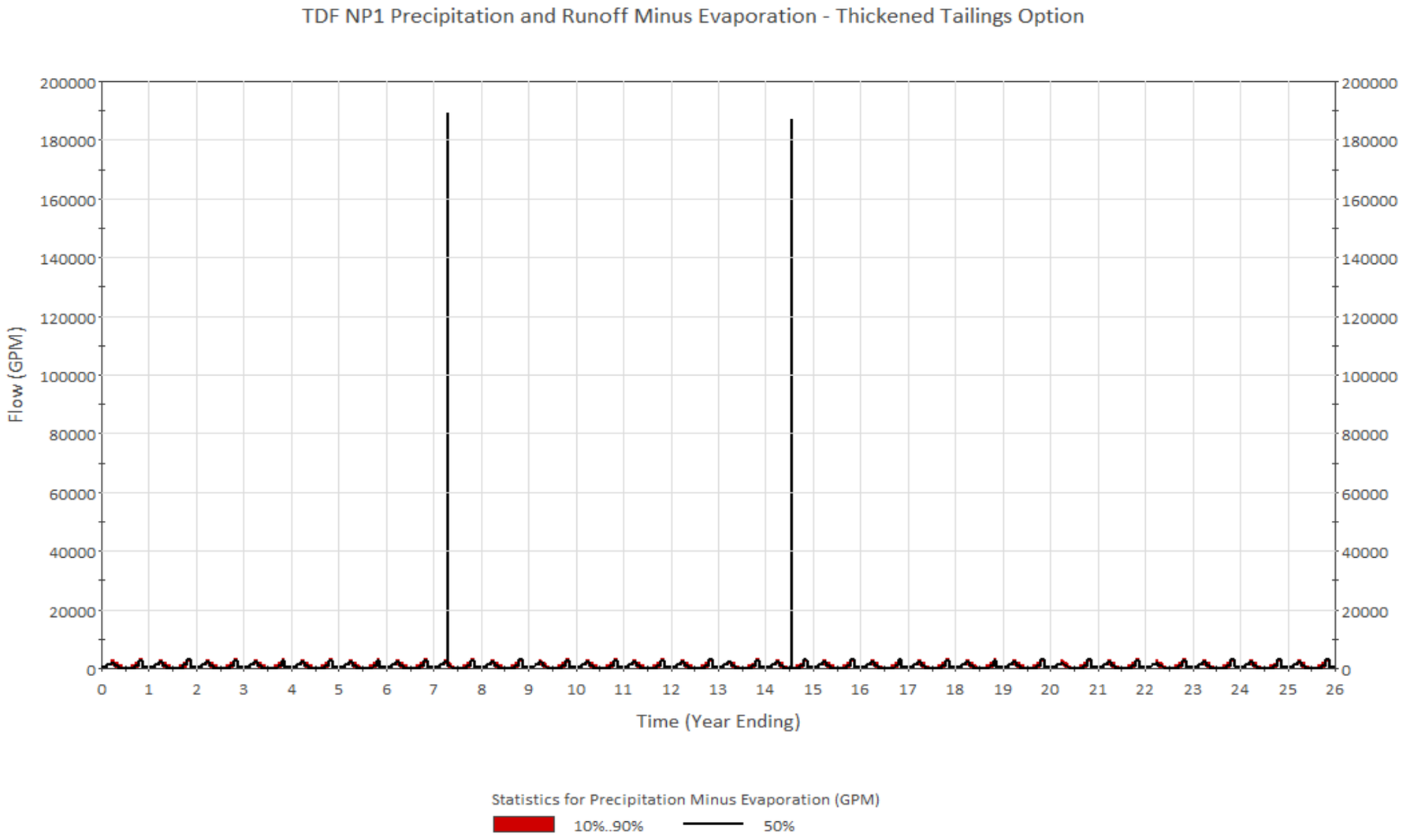
FIGURE C-2

TDF NORTH POND 1 INFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



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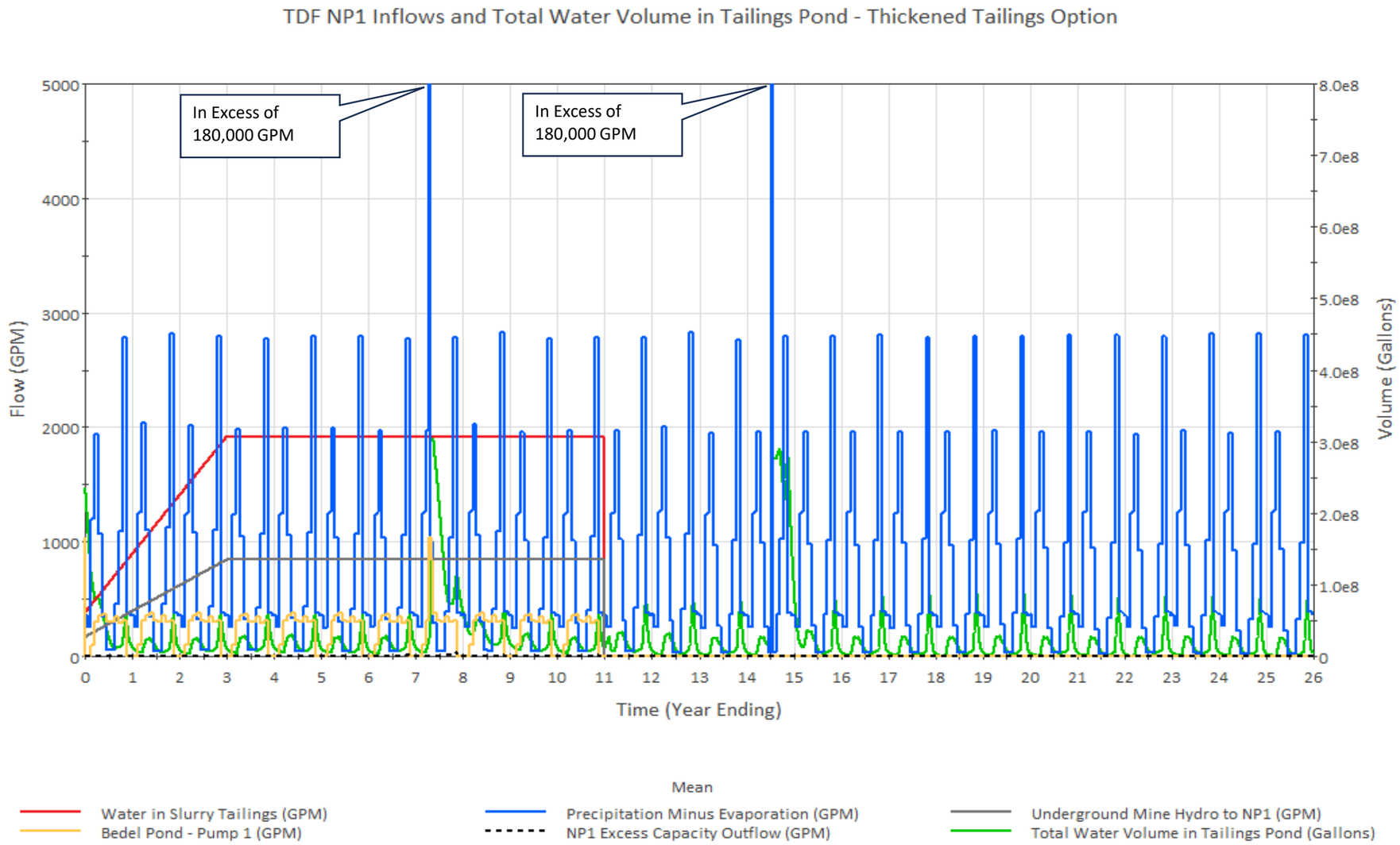
FIGURE C-2a

TDF NORTH POND 1 NET PRECIP P10 AND P90

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



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WHITE PINE COPPER LLC

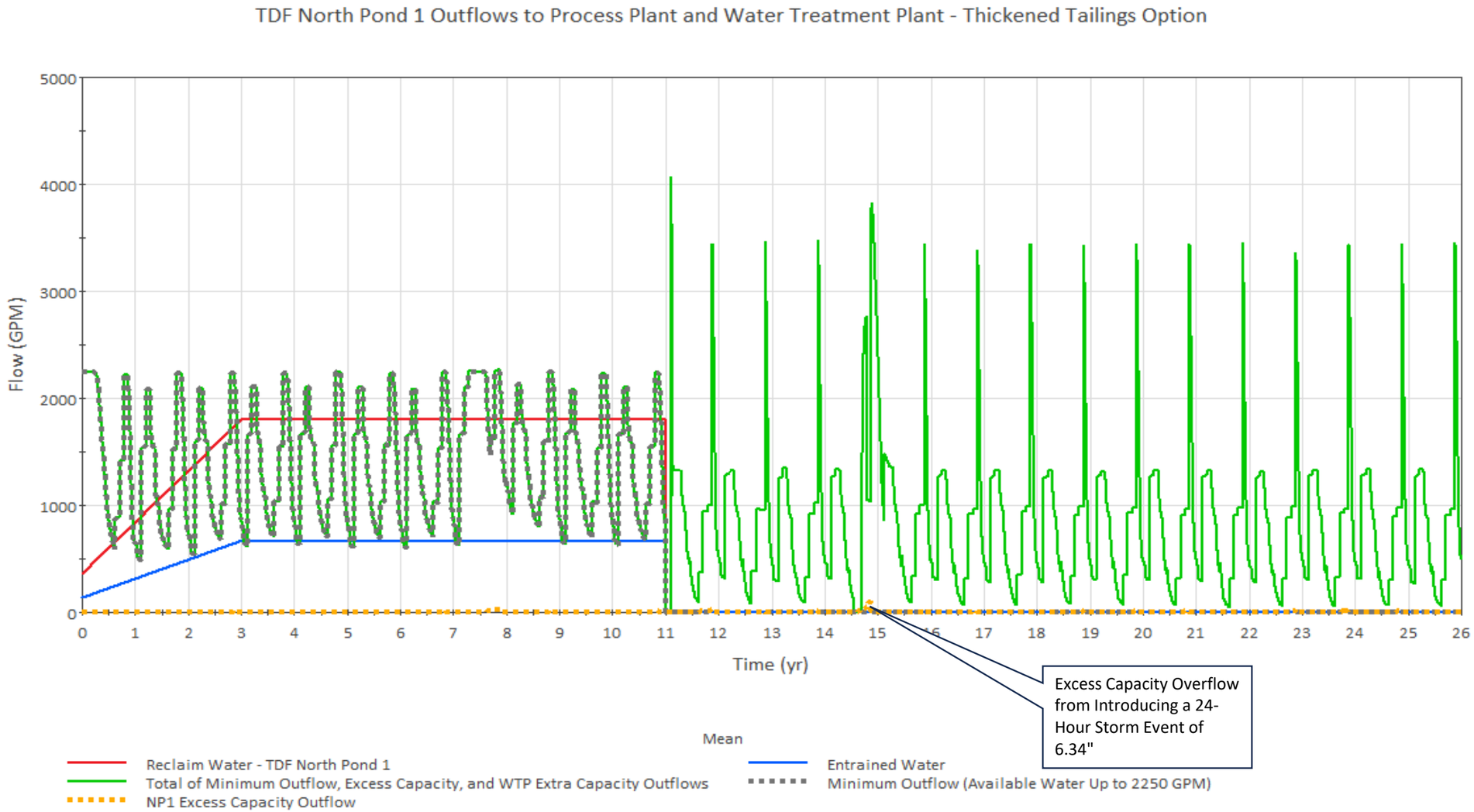
FIGURE C-2b

TDF NORTH POND 1 INFLOWS WITH TOTAL VOLUME

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



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WHITE PINE COPPER LLC

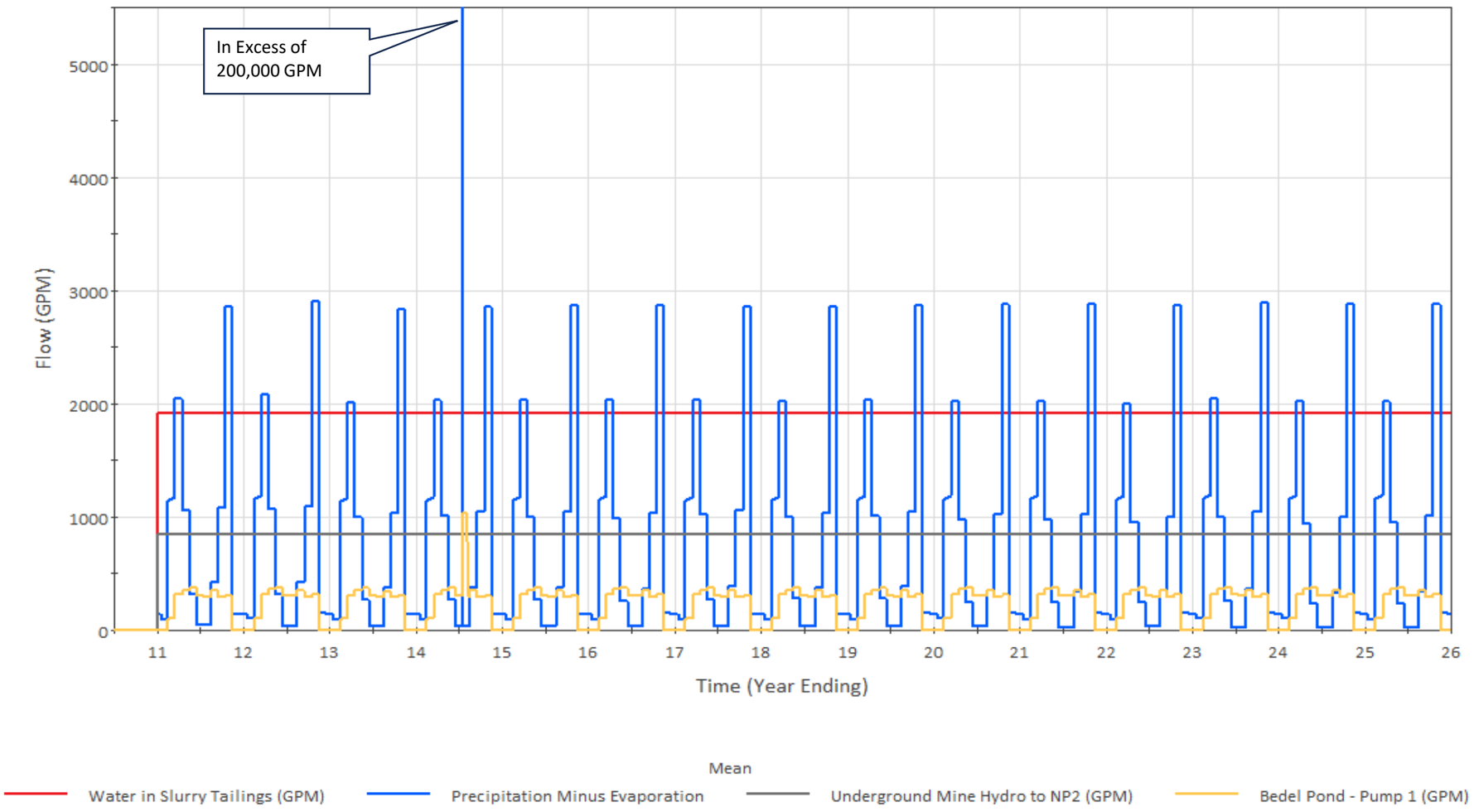
FIGURE C-3

TDF NORTH POND 1 OUTFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



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2. A 24-hour storm event of 6.34" of precipitation is assumed for May 1 in Year 8 and August 1 in Year 15.

WHITE PINE COPPER LLC

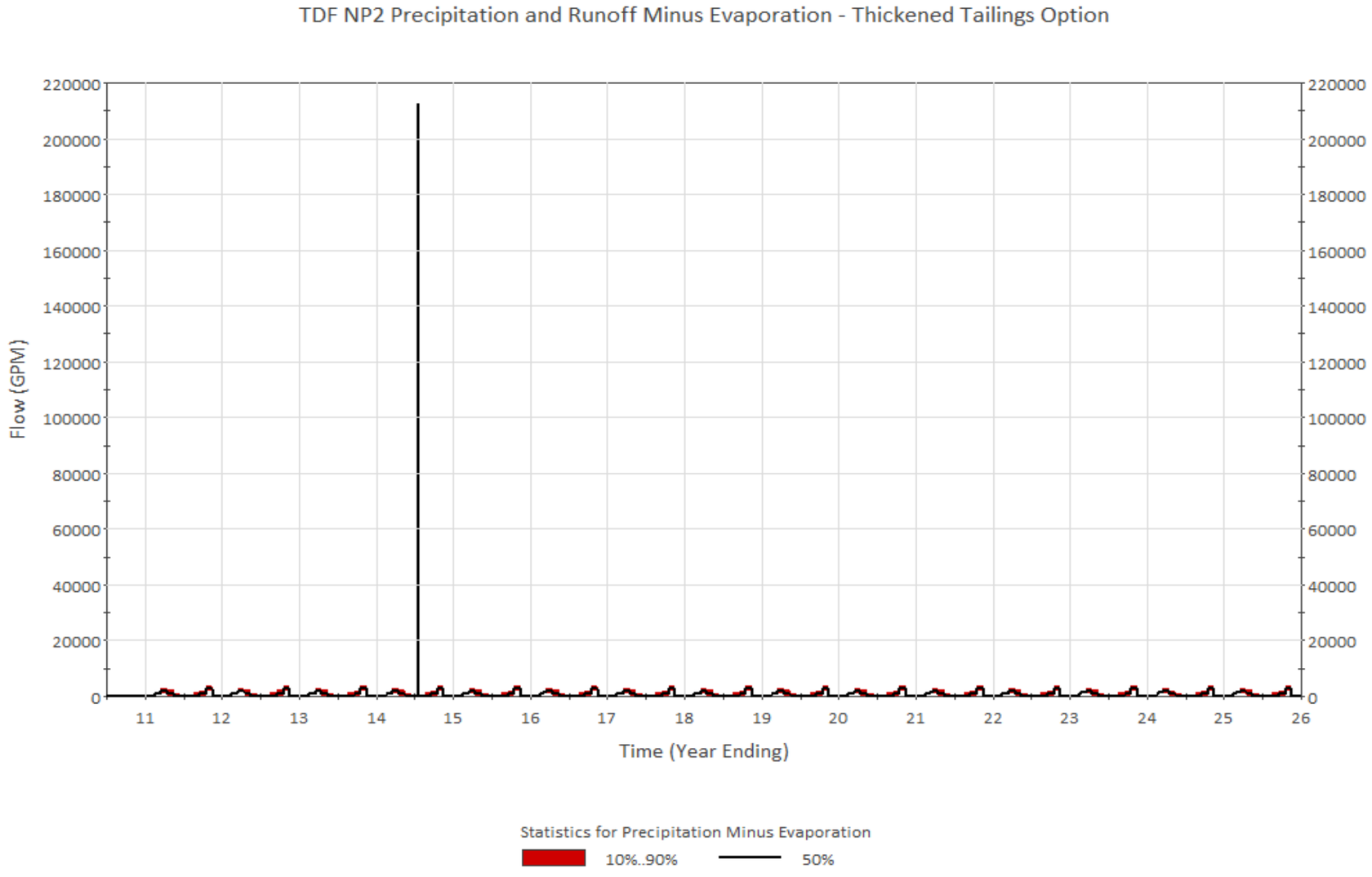
FIGURE C-4

TDF NORTH POND 2 INFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

1. Assumptions made for developing preliminary flow estimates include:
   -Site runoff/contact water and waste rock stockpile runoff water drain to Bedel Pond and do not enter the TDF.
   -Evaporation within both the TDF pond water and TDF dry ground areas is assumed to occur at an average open water evaporation rate of 23 to 25 inches per year based on the climate change model.
   -TDF NP2 Reclaim Area has a surface water drainage area of ~1897 Ac., a reclaimed water pond area of ~105 Ac., and a capacity of ~2169 Ac-ft.
   -TDF capacities are taken at 2% Deposition slope from Table 4 of the 2/17/26 TetraTech Memo regarding Water Management Philosophy of Operating and Design Storm Conditions.
   -The initial quantity in NP2 is assumed to be 1/3 the total capacity.
   -Results represent daily averages over 1000 simulations.

2. A 24-hour storm event of 6.34" of precipitation is assumed for May 1 in Year 8 and August 1 in Year 15.

Foth

WHITE PINE COPPER LLC

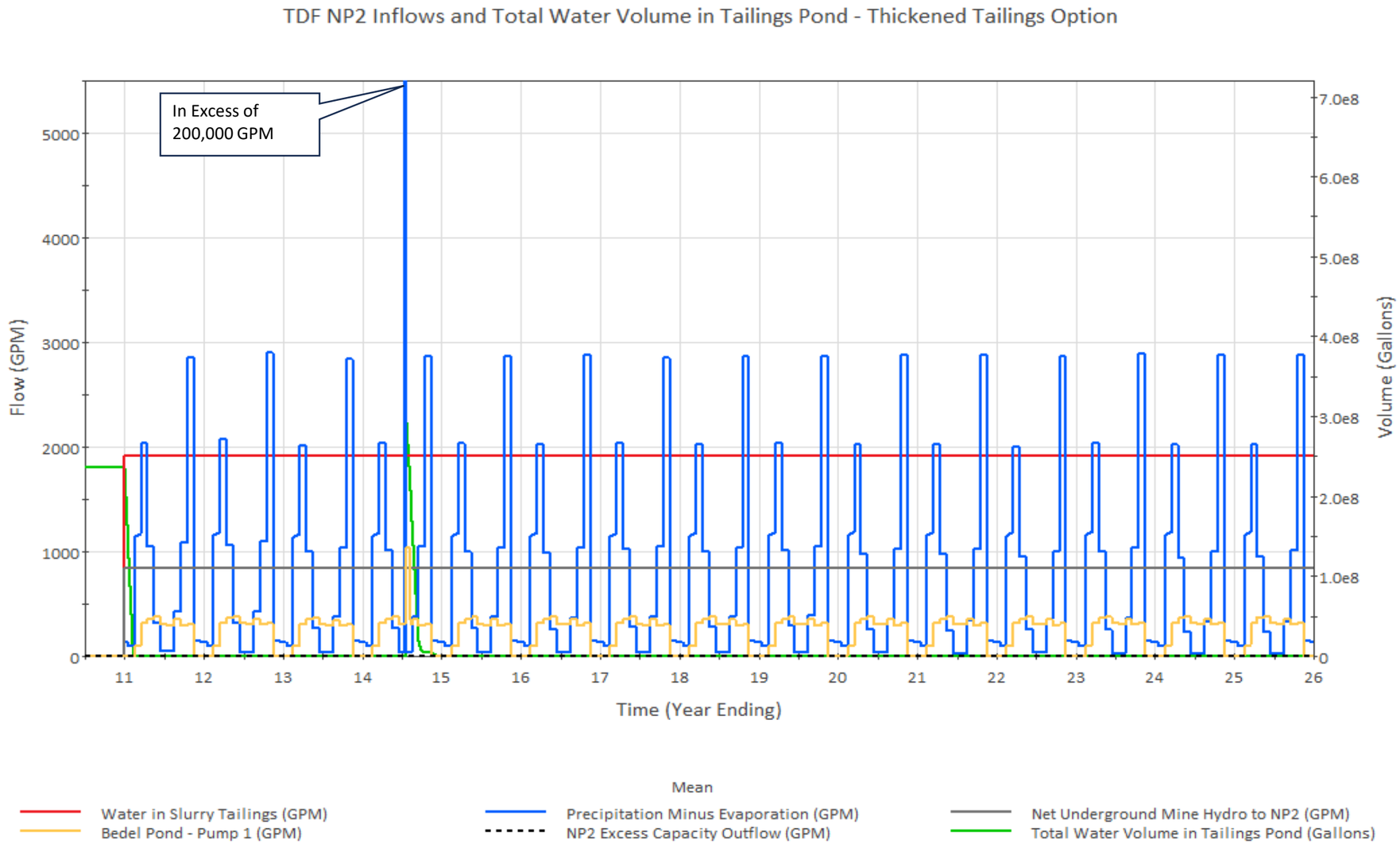
FIGURE C-4a

TDF NORTH POND 2 NET PRECIP P10 AND P90

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

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   - -Water entrained as pore water in tailings is modeled as a TDF outflow and not included in the TDF total water volume estimate.
   - -Total water volume refers to the total water in NP2 from precipitation and runoff plus total water in slurry tailings (excluding the water entrained as pore water in tailings).
   - -Results represent daily averages over 1000 simulations.
2. A 24-hour storm event of 6.34" of precipitation is assumed for May 1 in Year 8 and August 1 in Year 15.

Foth

WHITE PINE COPPER LLC

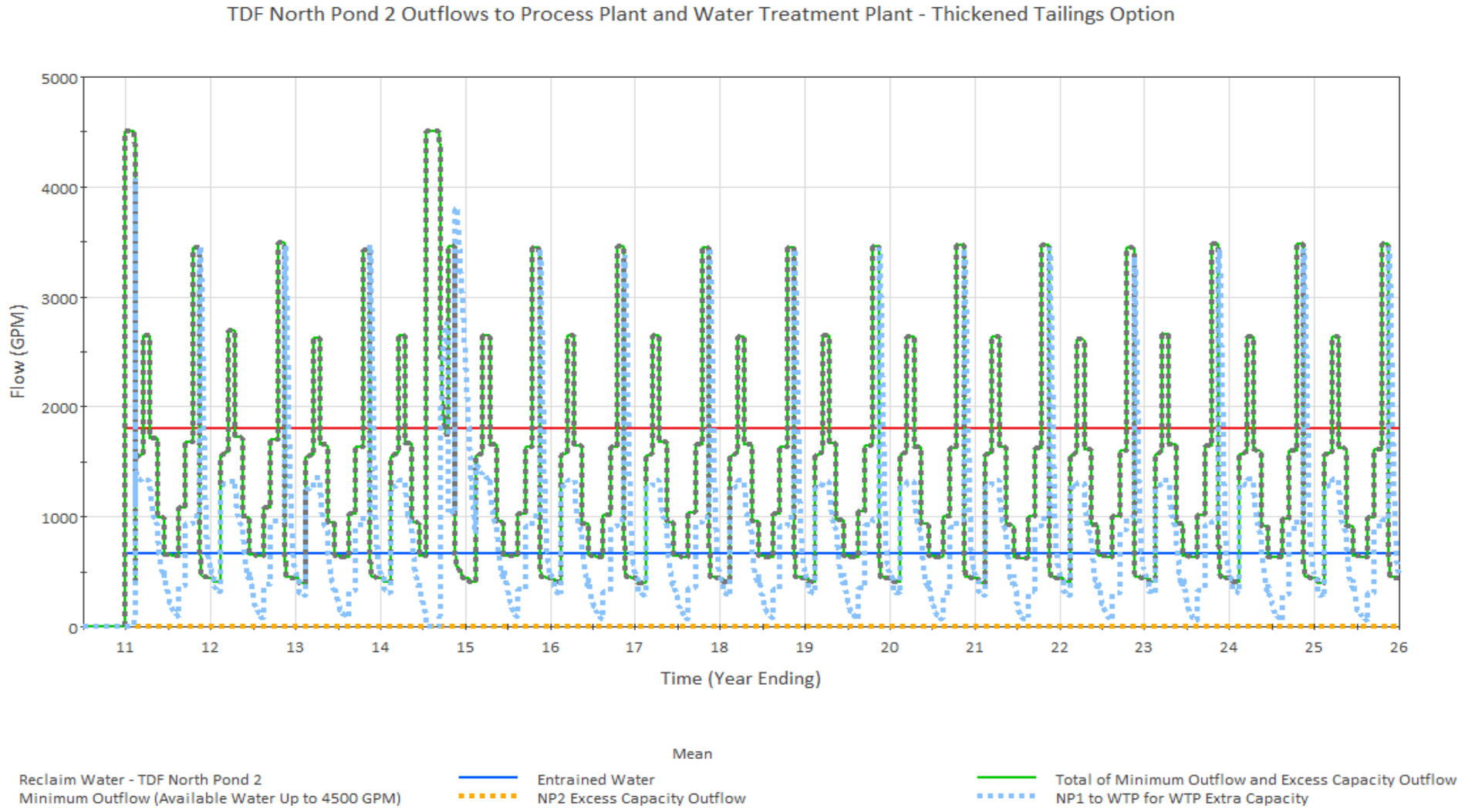
FIGURE C-4b

TDF NORTH POND 2 INFLOWS WITH TOTAL VOLUME

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

1. Assumptions made for developing preliminary flow estimates include:
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2. A 24-hour storm event of 6.34" of precipitation is assumed for May 1 in Year 8 and August 1 in Year 15.

Foth

WHITE PINE COPPER LLC

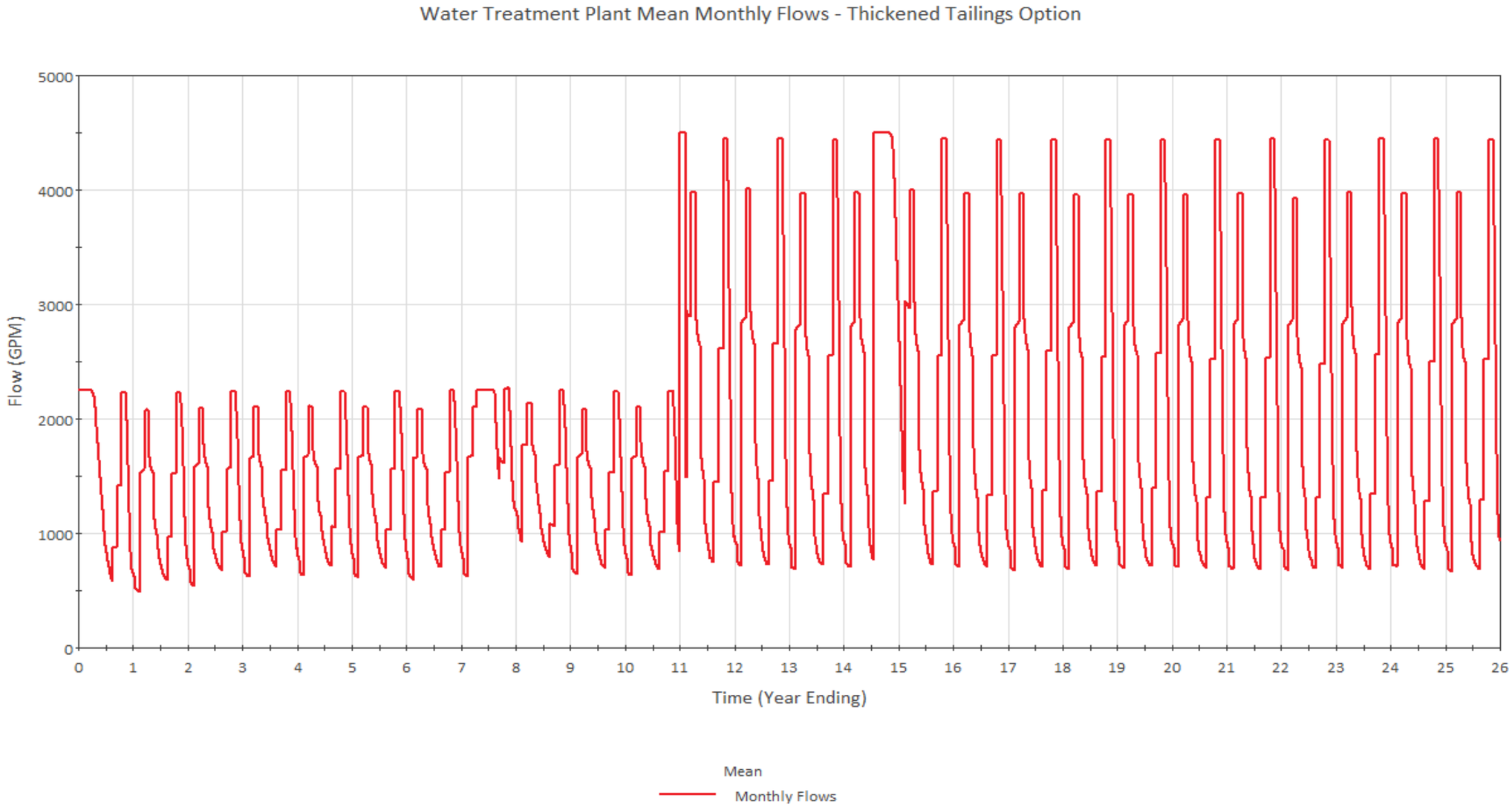
FIGURE C-5

TDF NORTH POND 2 OUTFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

1. Assumptions made for developing preliminary flow estimates include:
   -TDF NP1 has a surface water drainage area of ~1850 Ac., a combined reclaimed water/stormwater detention pond area of ~274 Ac., and a capacity of ~2164 Ac-ft.
   -TDF NP2 Reclaim Area has a surface water drainage area of ~1897 Ac., a reclaimed water pond area of ~105 Ac., and a capacity of ~2169 Ac-ft.
   -TDF capacities are taken at 2% Deposition slope from Table 4 of the 2/17/26 TetraTech Memo regarding Water Management Philosophy of Operating and Design Storm Conditions.
   -The initial quantity in both NP1 and NP2 is assumed to be 1/3 the total capacity.
   -Water is continuously pumped from the TDF to the treatment plant when available at a rate of 2250 GPM in Years 1 through 11, and 4500 GPM in Years 12 through 26, with additional outflow routed from the TDF to the treatment plant when TDF capacities are reached. Beginning in Year 12, outflow is also routed from NP1 to the treatment plant to match treatment plant extra capacity.
   -Results represent daily averages over 1000 simulations.

2. A 24-hour storm event of 6.34" of precipitation is assumed for May 1 in Year 8 and August 1 in Year 15.

Foth

WHITE PINE COPPER LLC

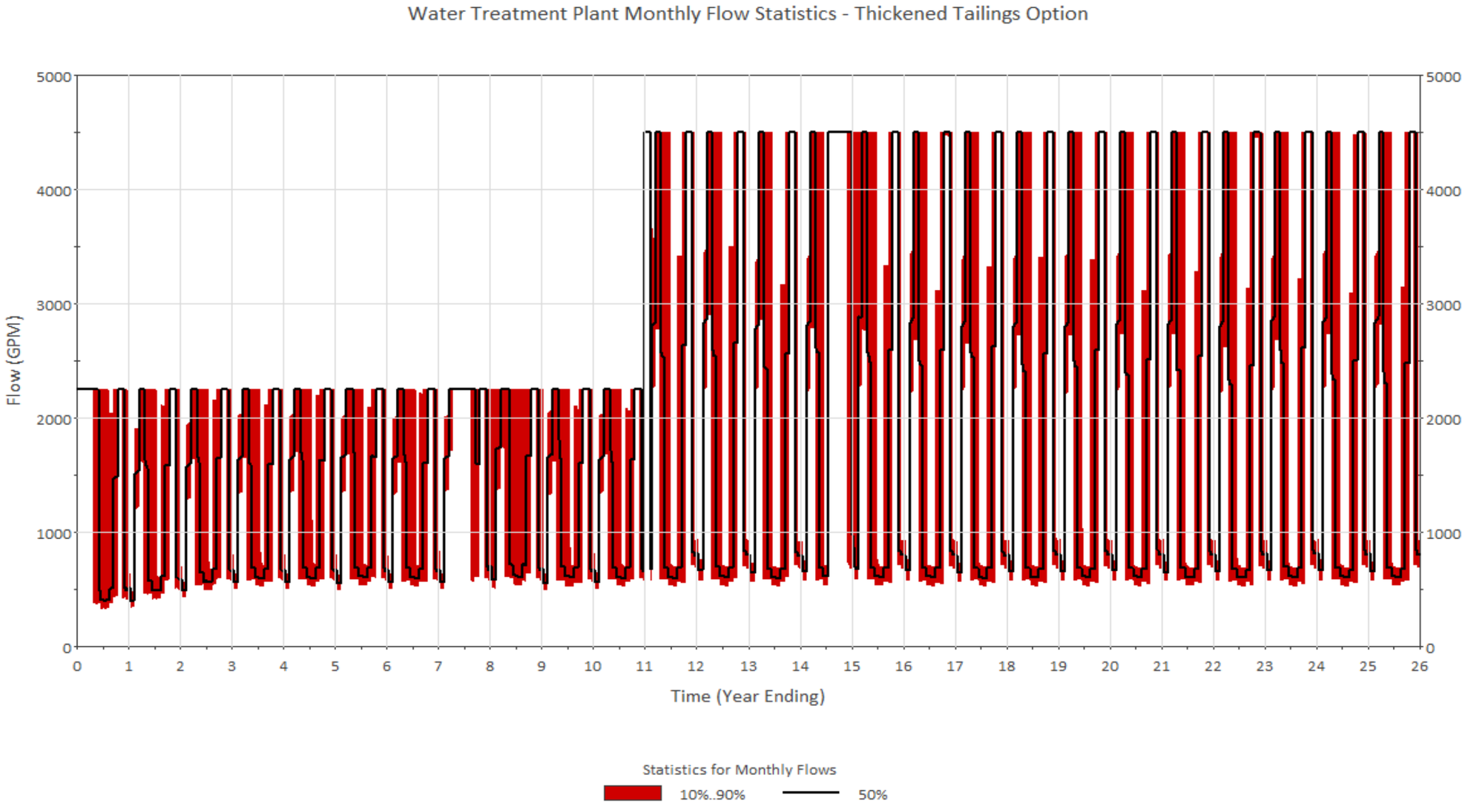
FIGURE C-6

WATER TREATMENT PLANT INFLOW - AVERAGE

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

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Foth

WHITE PINE COPPER LLC

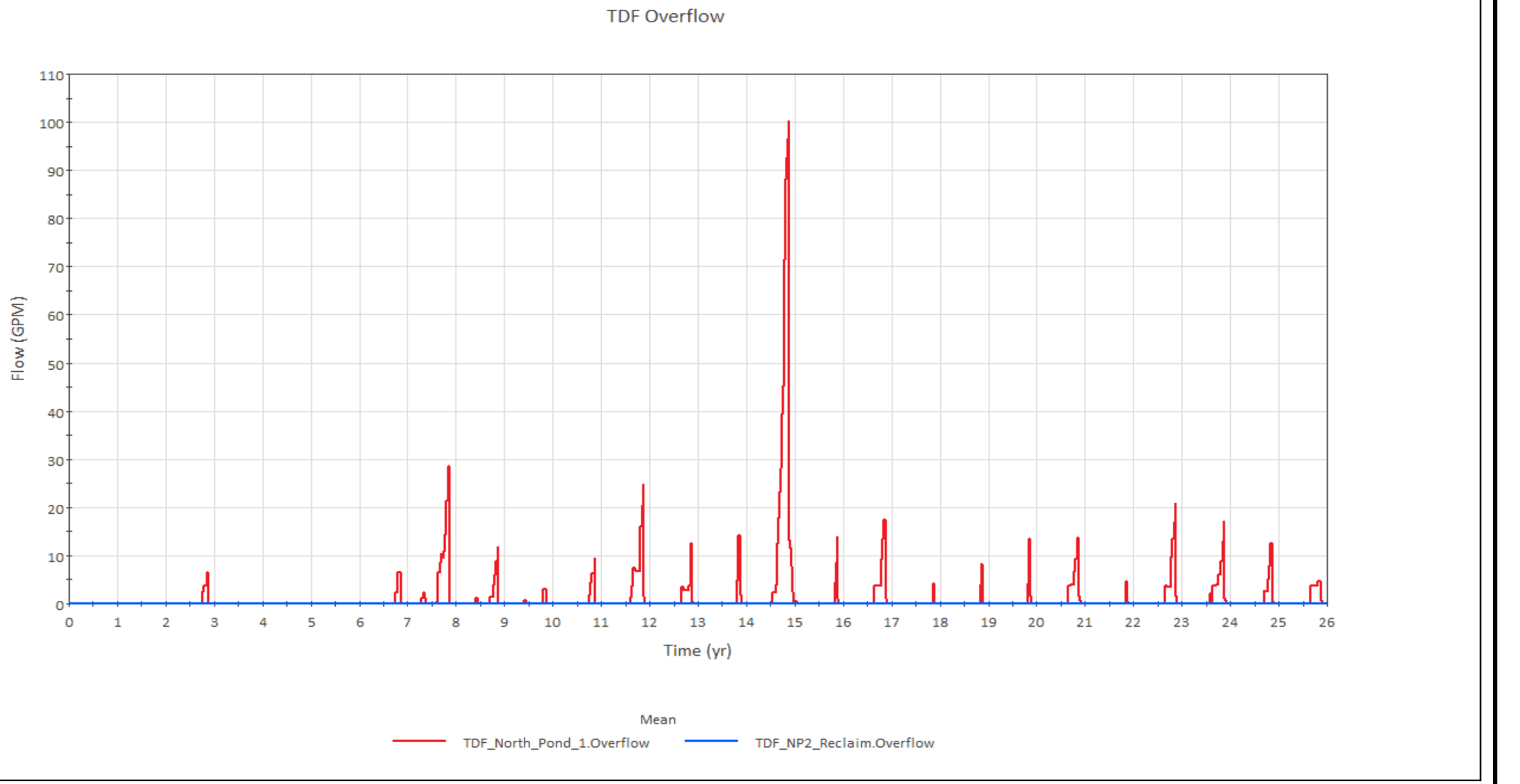
FIGURE C-6a

WATER TREATMENT PLANT INFLOW - P10, P50 AND P90

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200



NOTES:

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2. A 24-hour storm event of 6.34" of precipitation is assumed for May 1 in Year 8 and August 1 in Year 15.

Foth

WHITE PINE COPPER LLC

FIGURE C-7

TDF NP1 AND NP2 EXTRA CAPACITY OUTFLOWS

WHITE PINE NORTH

ONTONAGON COUNTY, MICHIGAN

Date: JULY 2026	Revision Date:	
Drawn By: SGL	Checked By: KBENUSA	Project: 23W200

E-5

Temporary Ore Stockpile Liner Design Criteria Technical Memorandum

Technical Memorandum

2121 Innovation Court, Suite 100
P.O. Box 5095
De Pere, WI 54115-5095
(920) 497-2500
foth.com

August 19, 2026

TO: Amanda Zeidler, White Pine Copper LLC
Chad Wolahan, White Pine Copper LLC

CC: Steve Donohue, Foth Infrastructure & Environment, LLC
Clinton Roberts, Foth Infrastructure & Environment, LLC

FR: Dan Michiels, Foth Infrastructure & Environment, LLC

RE: White Pine Copper – Temporary Ore Stockpile Liner Design Criteria

In support of White Pine Copper LLC's (WPC) Mining Permit Application (MPA), Foth Infrastructure & Environment, LLC (Foth) has prepared this Technical Memorandum (memo) as the Basis of Design (BOD) and Temporary Ore Stockpile liner design criteria document.

The information contained within this memo is meant to provide WPC, engineering, and design teams working on the MPA line of sight on the design requirements and regulatory framework applicable to the Temporary Ore Stockpile liner.

Regulatory Framework

The Michigan Department of Environmental, Great Lakes, and Energy (EGLE) oversees permitting and licensing authority over mine ore stockpiles.

1. **Geologic Resources Management Division (GRMD)** oversees Michigan mining regulations as defined under MI Part 632, specifically R 425.409 for ore stockpiles. Part 632 differentiates between non-reactive and reactive ore containment systems. For the purposes of this memo, a reactive ore determination is approached as the base case as the more restrictive regulatory review.

2. **Materials Management Division (MMD)** maintains permitting authority over the Solid Waste Program under Part 115, Solid Waste Management of Natural Resources and Environmental Protection Act (1994 PA 451, as amended). Part 115 was reviewed for waste confinement liner and wastewater management requirements.

Whereas Part 632 is specific to ore stockpile liner requirements, design criteria is performance based. Part 115 contains specific design criteria that will be used for this evaluation as it provides a similar EGLE department framework for containment liner design.

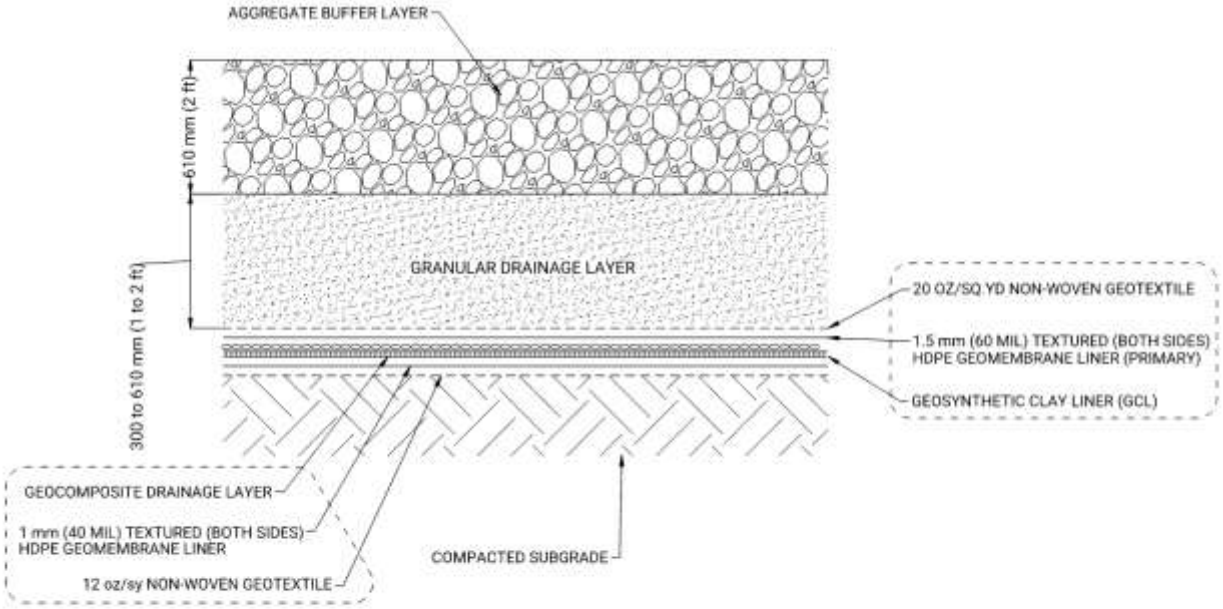
Environmental Design Criteria

A **composite liner system** is required for the ore stockpile as detailed in Michigan Administrative Code R 425.409 and will be comprised of the following from bottom up:

- Compacted subgrade
- 12 ounce per square yard (oz/sy) non-woven cushioning geotextile
- 1 millimeter (mm) (40 mil) High Density Polyethylene (HDPE) geomembrane (secondary liner)
- 200 mil geocomposite
- Geosynthetic clay liner (GCL) or 0.91 meters (m) (3 foot) compacted soil layer
- 1.5 mm (60 mil) HDPE geomembrane (primary liner)
- 20 oz/sy non-woven cushioning geotextile

The compacted soil layer is required to be constructed out of cohesive soil with an in-place hydraulic conductivity of $1x10^{-7}$ centimeters per second (cm/sec). To meet this requirement, the soil layer is typically constructed out of clay or high cohesive soils. Approximately 55,800 cubic meters (m^3) of clay would be required. A reinforced GCL is recommended as an alternative material to natural clay for providing equivalent or superior performance, unless suitable soils are identified during further exploration.

Details of the composite liner system are shown below.



LINER DETAIL (TYP.)

The Temporary Ore Stockpile liner is planned to be designed to meet requirements as detailed under MI 425.409(a) and are as follows:

- Leachate collection system for contact water management to maintain <1 foot (31.5 centimeters [cm]) of head on the composite liner.
- Leak detection system.
- Testing program for liner, leachate collection system, and leak detection system prior to ore placement.
- Cover (see closure).

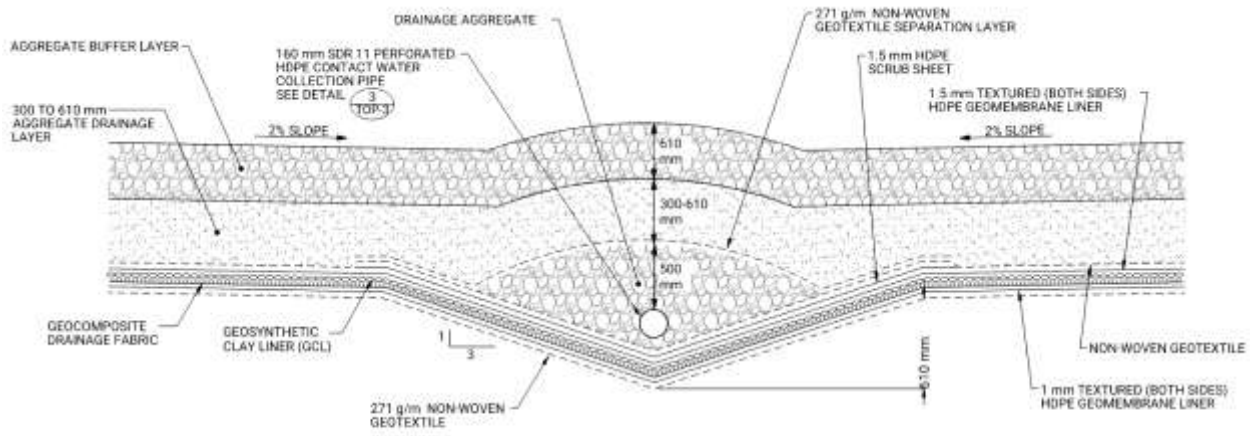
The base liner grades are planned to be sloped between 2 to 4% outwardly to the leachate collection system. The drainage layer will collect vertically draining water and laterally convey it to the collection system. A 5-m (16.4 foot) perimeter berm is planned with a 3:1 inward slope to surround the stockpile for containment and collection of contact water. The composite liner system will extend up the side slope and embed in an anchor trench at the top of slope. Precipitation falling within the limits of the perimeter berm will be managed as contact water. Outside of the berm, precipitation will be shed as non-contact water.

Contact Water Collection System

A 610 cm (2 foot) drainage layer will be required above the primary liner consisting of aggregate. The drainage aggregate may consist of rock (smooth or crushed) or sand having a minimum hydraulic conductivity of 1×10^{-3} cm/sec with a P200 less than 5%. Materials may be obtained on site or from off-site borrow if on-site materials do not meet requirements. The base floor will be sloped minimum 2% to collection trenches. At this time, off-site sourced aggregate will be assumed. Prior to construction, consideration for use of on-site crushed development rock as the drainage aggregate could be further explored to optimize reclaim and reuse of the drainage material upon decommissioning of the pad.

Consideration for reduction of the drainage layer thickness to 300 mm (1 foot) may be given provided adequate protection of the composite liner system is provided from damage from mechanical and load bearing conditions. Primary damage to liner system is typically from mechanical means (construction) or operational (live vehicle loads) during which the liner is subjected to vehicle traffic. Long term, a 300 mm liner is shown to provide adequate hydraulic conductivity to convey accumulated water and reduce head on the composite liner system. Stockpile filling and reclaim operations are detailed later with procedures for liner protection.

Collection trenches will be sized and sloped for collection and conveyance of accumulated contact water to the sump. A 160 mm (6 inch) dia. SDR11 perforated HDPE pipe will be bedded within the trench sloped at 1 to 2% to the sump. The pipe will be bedded with 50 cm of washed, coarse drainage aggregate with a minimum hydraulic conductivity of 1×10^{-1} cm/sec. The drainage aggregate should have a D80 for compatibility with 15 mm (0.5 inch) dia. pipe perforations. A section of 1.5 mm (60 mil) HDPE geomembrane may be installed below the pipe within the collection trench as a scuff sheet for additional protective buffer of the primary liner system. A detail of the trench is below.



COLLECTION TRENCH DETAIL (TYP.)

The sump will be located at the low point of the basal area and sized approximately 1.2 m (4 feet) deep. The sump will have 3:1 sloped sidewalls with a base footprint approximately 5-m-wide by 8-m-long. The sump will be filled with coarse drainage aggregate and house two 450 mm (18 inch) dia. perforated HDPE contact water riser pipes, each housing a pump. The drainage aggregate should have a D80 for compatibility with 15 mm (0.5 inch) dia. pipe perforations. The submersible pumps with a pumping capacity of approximately 300 to 380 liters per minute (80 to 100 gallons per minute [gpm]) each will be installed within the riser pipes in lead-lag setup. A pump controller will be installed within a control panel at the top of the perimeter berm. The pump panel will require 480VAC, 3-phase power.

The pumping system will be operated to remove accumulated liquids from the sump and maintain minimal head on the primary liner system. Setpoints for pump ON and OFF positions will be established via the control panel based on water elevations measured using a pressure transducer mounted on the pump or within the riser pipe. Access cleanouts will be provided along the pipe for pipe cleaning as necessary.

Contact Water Force Main

Pumped contact water will be conveyed via forcemain to a common pipeline to Tailings Disposal Facility North Pond 1, as shown on Figure TOP-1. Cleanout manholes spaced every 100to 200 m will be provided along the force main route at critical locations for vacuum and air relief valves as necessary. The forcemain is planned to be 160 mm (6 inch) dia. inch SDR 11 HDPE and approximately 350 m (1,150 feet) in length.

Leak Detection System

A leak detection system will be installed below the composite liner system. A 407 grams per square meter (g/m^2) non-woven geotextile (12 oz/sy) will serve as a cushioning layer from subgrade soils. The liner will be comprised of a 1 mm (40 mil) HDPE textured geomembrane. A geocomposite drainage net with a 5 mm (200 mil) geonet between two 271 g/m^2 (8 oz/sy) non-woven geotextiles geocomposite drainage net comprised of an HDPE geonet in between two layers of non-woven geocomposite will serve to transfer any leakage waters along the

sloped basal area to collection trenches with 160 mm (6 inch) dia. HDPE collection piping and to the sump.

The leak detection sump will be located at the low point of the basal area and approximately 700 mm (2 feet) below the contact water sump. The sump will be filled with drainage aggregate and houses a 450 mm (18 inch) dia. perforated HDPE contact water detection pipe. A pressure transducer will be extended to the pipe low point for monitoring water level measurements. The pipe will be sized for pump deployment in the event accumulated water is detected.

Seepage Modeling

The Hydrologic Evaluation of Landfill Performance (HELP) model is an U.S. Environmental Protection Agency (USEPA)-developed, quasi-two-dimensional water-balance model used to evaluate seepage, drainage, and liner leakage for landfill and containment system designs. Nearby historical weather station data from Ironwood and Ontonagon, MI was used to simulate precipitation, runoff (zero), and infiltration as well as solar radiation data from the NREL for evapotranspiration. Liner details were simulated to determine lateral drainage, leachate collection, and potential leakage through soil and geomembrane liner systems. USEPA and state permitting agencies routinely rely on HELP outputs to demonstrate compliance with Resource Conservation and Recovery Act performance standards and to evaluate allowable head and seepage rates above landfill liners during permitting and closure review.

A summary of results for a 5-year period of simulated liner performance is below and was used for sump sizing. The model evaluated half of the liner footprint at a time for uni-directional seepage flow modeling and results are doubled as appropriate and rounded (nearest thousand).

- 7.5-acre modeled (doubled to 15 acres)
- Average Annual Precipitation: 37.7 inches
- Total Annual Precipitation: 15,350,000 gallons
- Runoff: 0 (full containment)
- Evapotranspiration: 444,000 gallons
- Peak Daily Drainage: 239,000 gallons
- Peak Daily Drainage Rate: 166 gpm

The maximum head on the primary liner was modeled at 6.0345 inches approximately 38 feet from the toe of slope. This meets the maximum head requirements with the assumption that the sump and pump are sized to handle maximum daily rates. Average and smaller storm events will result in lower head amounts. HELP model output is included as Attachment 1.

Earthwork Overview

Earthwork activities associated with construction of the Temporary Ore Stockpile are anticipated to begin in the spring of 2028, with the objective of completing pad grading and preparation in advance of liner installation such that the facility is ready for operational use by the end of 2028. The facility footprint including a perimeter maintenance is approximately 74,900 square meters. The existing area will be cleared and grubbed, followed by stripping and stockpiling of an estimated 11,500 m^3 of topsoil for later reuse. Excavation to the design subgrade surface as well as placement of materials for the perimeter berm and grading is estimated to produce a net surplus of approximately 54,200 m^3 of soil for stockpiling nearby.

Soils within the Temporary Ore Stockpile footprint are characterized as glacial till material having a sandy to fine grained texture with varying amounts of gravel and sandy lenses. Historic well logs around the perimeter of the proposed footprint suggest low to moderate plasticity clay was encountered in the upper soils exceeding 5-m-thick in certain logs; however, laboratory soil classification was not performed (MFG, 1999[1]). There is potential for finding localized pockets of clay content in red glacial till which could be evaluated as low permeable material for use in the liner system. Groundwater was noted in historic well logs to exist greater than 10-m below ground surface around the footprint of the stockpile. Perched lenses of saturation within the fill material are also noted to have been observed (MFG, 1999).

Excavated materials will be retained on site and placed in designated topsoil or excess soil stockpiles following completion of grading and shaping activities. Any unsuitable materials will need to be managed separately. Prior site maps indicate the potential for encountering uncontrolled fill or refuse material such as tires, inert materials, and other items (MFG, 1999). Subgrade soils within the footprint may require localized conditioning, including moisture adjustment and proof-rolling, to provide a uniform and stable foundation as well as a cushioning layer for the lower leak detection layer. Limited soil boring information near the footprint suggests existing site soils are anticipated to be suitable construction materials based on available geotechnical information. Additional geotechnical borings within the facility footprint are recommended to characterize foundation suitability and excess soil characteristics, and to confirm the depth to groundwater for freeze/thaw considerations.

Construction of perimeter berms will be coordinated with grading activities and will incorporate surface water management features, including diversion of upstream runoff, to limit run-on to the pad footprint and maintain appropriate drainage control during both construction and operation. Additional safety berms will be constructed on construction access routes as appropriate.

Stockpile Filling and Development

Initial filling of the Temporary Ore Stockpile will coincide with early underground mine development activities and is anticipated to occur primarily during the first year of mine development. Ore delivery to the pad will initially be via haul trucks and then transition to the portal conveyor system once constructed. Once started, ore transport via the portal conveyor system will represent the controlling element for material delivery rates during this period. The conveyor belt is assumed to operate at a nominal speed sufficient to deliver approximately 1,000 to 1,200 metric tonnes per hour. Ore will discharge from the belt through a chute and be deposited onto a conical surge pile at the transfer location. The location will be paved and sloped to the roadside ditch for contact water management. Front-end loaders will then reclaim material from the conical pile and load large off-road mining haul trucks (e.g., Caterpillar 785 class) for transport to the lined ore pad.

Placement on the pad will begin with construction of an initial minimum 1 to 1.5-m-thick working roadway, inclusive of the underlying drainage layer thickness, to provide adequate liner protection and support heavy haul traffic. Depending on operational timing, the drainage layer can be constructed fully ahead of ore storage placement or combined with the initial working

[1] MFG, Inc. 1999. Remedial Investigation Report, White Pine Mine. December 1999.

roadway construction workflow. Ore will be placed in a fan-out pattern from the constructed roadway and from internal roadways spanning the pad footprint. Filling will proceed to complete an initial lift of approximately 5 m of ore thickness. Following completion of the first lift, a second lift will be initiated with development of 15-m-wide benched haul roads and buffer. Subsequent second and third lifts will be constructed using approximately 4-m-high benches, with access roads formed of ore rock between benches to support continued placement and future reclaim operations. The total storage capacity of the ore stockpile is approximately 534,500 m^3 with the drainage layer consuming approximately 48,600 m^3. The resulting ore storage volume is estimated at 852,200 metric tonnes, assuming a blasted ore bulk density of 1.65 grams per cubic centimeter.

Haul roads and benches will be designed to support two-way vehicular traffic during both filling and subsequent unloading activities. Exterior slopes will be constructed at an approximate 1.5H:1V inclination to promote stability and maintain equipment access. Roadway surfaces will be crowned or pitched outward at approximately 2 to promote positive drainage and limit ponding on active travel surfaces.

Ore Stockpile Filling/Reclaim Operations

Filling of the Temporary Ore Stockpile will be governed by ore delivery from the plant portal conveyor system, which will control the maximum rate at which material can be transferred to the pad during early mine development. Ore delivered by the conveyor will be discharged through a chute to a surge pile and subsequently rehandled for placement on the pad. For planning purposes, conveyor throughput is assumed to operate at a sustained rate consistent with the conveyor geometry and belt configuration discussed previously, with allowance for ramp-up during initial commissioning and operational variability. Based on these assumptions, the total storage pad capacity of approximately 852,200 metric tonnes is anticipated to be achieved within the first several months of operation following commencement of ore delivery.

It is assumed that the ore pad will be filled within approximately 5 to 6 months. Fill rates will be ramped up over time.

Table 1
Filling Rates

Sequence	Timeline	Monthly Throughput	Production
Initial Ramp Up Period	2 months	100,000-150,000 tonne	260,000 tonne
Sustained Rate	3-4 months	220,000-260,000 tonne	500,000 tonne

Note:
Ramp up assumed at 10 hours per day, 5 days per week with overall operational efficiency 80%. Prepared by: DJM4
Checked by: BLK1

Ore placement will be subject to equipment loads on the liner materials. Materials should be first placed to build up a tipping pad at the edge of stockpile along the middle of the western edge. Low ground pressure equipment shall be used to fan out materials for an initial thickness of 1 m above the drainage layer to form roads. Large haul trucks will be permitted to travel where materials are a minimum of 1.5 m above the composite liner.

Ore reclaim activities will consist of loading haul trucks within the stockpiles. Ore should be removed from upper lifts or benches. Once within 2 to 3 m of the base liner, additional care should be taken with ore removal to avoid mechanical damage to the primary liner. Equipment equipped with GPS on blades and buckets shall be used. Low ground pressure equipment should be used to accumulate materials for loading within 1.5 m of the base liner surface. The reclaim timeline is anticipated to be longer than fill rates with drawdown limitation based on operators' availability for equipment operation and ongoing belt production feed rates to the processing facility. Reclaiming material from south to north may be conducive to advanced closure of the southern ore pad area.

Closure and Sequencing

Once store ore has been reclaimed into the process, the Temporary Ore Stockpile will remain intact with contact water drainage systems in place. Future use of this pad includes contact water management from snow melt in winter months and temporary operational storage of mined materials, as needed.

Upon determination that the pad no longer serves a beneficial role to production operations, reclaim and closure of this pad will occur promptly to reduce future contact water generation. A phased closure approach will occur with the southern half of the pad (3.5 hectares) to be initially reclaimed to decrease operation costs and allow reuse of this area for future activities as needed. To facilitate partial removal, a divider berm will be constructed, and drainage material will be reclaimed and relocated to the northern portion of the pad or elsewhere on the property. The portions of the liner system to be reclaimed should then have the anchor trench exposed and the liner cut approximately 5 m from the edge of the divider berm. Once the southern portion of the liner is removed, the edge of the liner will be reinstalled in a new anchor trench along the southern edge of the new footprint.

The reduced footprint ore storage pad area can remain for use as storage of materials, making use of the liner as a containment system as appropriate. For final closure, environmental testing of drainage materials and contact water discharges are anticipated to facilitate development of a final closure plan in conjunction with other operational facilities and sequencing at the site.

Construction Quality Assurance/Certification

Construction of the liner systems will need to be overseen and certified by a Michigan registered professional engineer. As part of this, an electronic leak location test shall be conducted on the lower leak detection liner system prior to construction of the composite liner. The composite liner will also be tested following placement of the drainage layer. Specifications for liner materials will be reviewed by the engineer and documentation of provided materials will be required during the construction process through the submittal process.

Attachments:

Table
Drawings
Attachment 1 HELP Model Output

Table

Table 2

Material Quantity Take Offs - Temporary Ore Stockpile Pad

Commodity Code Description	Quantity	Units	Drawing Reference	Comment
Clear & Grub	7.49	Hectares	TOP-01	Limits of ore pad grading
Stripped Topsoil	11,419	m^3	TOP-01	Limits of ore pad grading, 0.15 m (0.5 feet)
Bulk excavation to subgrade, common earth	76,168	m^3	TOP-2	Cut to subgrade elevation below liner, excess soils to stockpile
Grading and Fill	-21,954	m^3	TOP-2	Fill to finished grades along perimeter berm
Excess Fill to Stockpile	54,214	m^3	TOP-2	Bulk excavation, grading removed
Road Geotextile	5,950	m^2	TOP-01	All roadways
Road SubBase - Spread & Compact (0.3 m)	3,035	Tonne	TOP-01	30 cm thick, 1.7 tonne/m^3
Road Base - Spread & Compact (0.2 m)	2,023	Tonne	TOP-01	20 cm thick, 1.7 tonne/m^3
Cushioning Geotextile - 271 g/m^2	60,980	m^2	TOP-1, TOP-3	Line area, anchored at berm
Geomembrane Layer 1 - 1mm HDPE	60,980	m^2	TOP-1, TOP-3	Line area, anchored at berm
Geocomposite Drainage Layer	60,980	m^2	TOP-1, TOP-3	Line area, anchored at berm
Geosynthetic Clay Liner (GCL)	60,980	m^2	TOP-1, TOP-3	Line area, anchored at berm
Geomembrane Layer 2 (Primary) - 1.5 mm HDPE	60,980	m^2	TOP-1, TOP-3	Line area, anchored at berm
Cushioning Geotextile - 813 g/m^2	60,980	m^2	TOP-1, TOP-3	Line area, anchored at berm
Scuff Sheets	2,000	m^2	TOP-2, TOP-3	Below collection piping
HDPE sheet stocks	2	Ea	TOP-3	125x300 mm sheets, 20mm thick
Drainage Layer Aggreagate - 60 cm	18,588	m^3	TOP-1, TOP-3	Lined area, 2 cm stone, 1.7 tonne/m^3
Collection Pipe - 160 mm dia HDPE, SDR 11	2,000	m	TOP-2, TOP-3	Collection trenches, backfilled with stone
Cleanout Pipes, Fittings, Caps, 160 mm dia HDPE, SDR 11	12	Ea	TOP-2	6 m pipe sticks, Wye, elbow (2), and cap
Collecton Trench Stone - 3 cm aggregate	3,728	Tonne	TOP-2, TOP-3	61 cm deep, 3:1 slopes along trench
Sideslope Riser Pipe - 450 mm dia HDPE, SDR 17	20	m	TOP-2, TOP-3	Containment pipe through sump, up slide slopes to Pump Building, contact water + leak detection
Pump Discharge Piping - 90 mm dia HDPE, SDR 11	20	m	TOP-2, TOP-3	Inner pump discharge pipe within Containment pipe
Sump Stone - 3cm aggregate	225	Tonne	TOP-3	Sump, 1.2 m deep
Lift Station Equipment Package	1	LS	TOP-3	Pump house, pump (2), controls
Supply and installation of pipe, including trench excavation, backfill and bedding material	350	m	TOP-1	Force main, 6" dia. HDPE pipe to discharge, buried
Pipe Bedding Stone	297.5	Tonne	TOP-1	70 mm x 70 mm pipe trench stone bedding, 1.7 tonne/m^3
Riprap R-150 (ASTM D6092) (Riprap around all pipe inlets and outlets)	10	m^3	TOP-1	Pipeline outlet location

Notes:

cm = centimeter

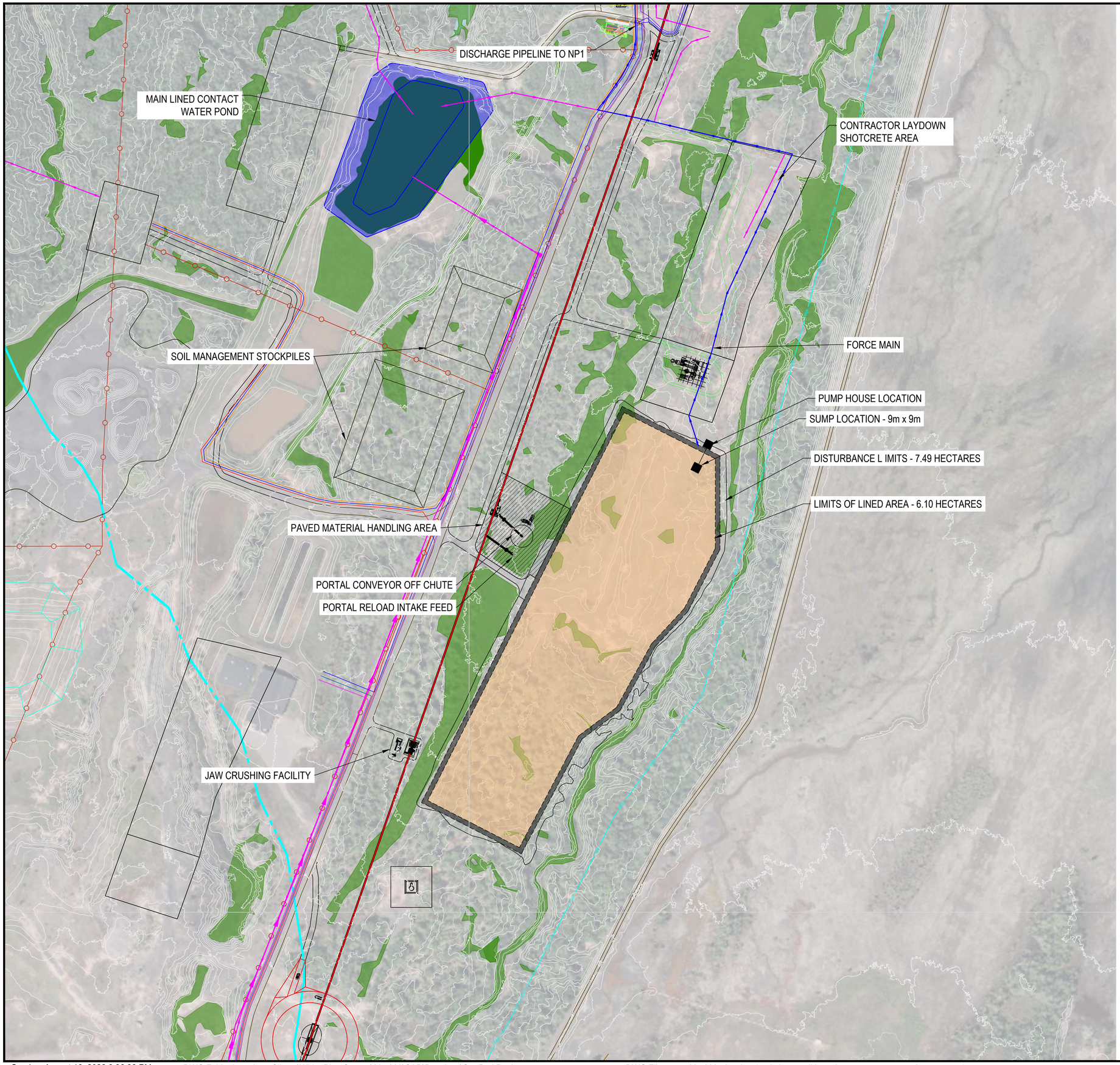
g/m^2 = grams per square meter

LS = lump sum

Prepared by: DJM4

Checked by: BLK1

Drawings



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PROPERTY SUBAREA
- EXISTING ROADWAY
- EXISTING/PROPOSED ELECTRIC LINE
- EXISTING DELINEATED WETLAND
- PROPOSED ROAD
- PROPOSED FORCE MAIN
- PROPOSED CONTACT WATER PIPING
- PROPOSED FORCE MAIN
- PROPOSED ORE STOCKPILE
- PROPOSED SUMP

NOTES:

1. BASE AIR PHOTO FROM BING MAPS.
2. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
3. HYDROGRAPHIC FROM USGS.
4. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
5. TOPOGRAPHY RECEIVED FROM AUSENCO BASED ON LIDAR SURVEY BY QUANTUM. DATE OF ACQUISITION MAY 2014.
   CONTOUR INTERVAL = 1m

25 0 25 50 75 100 125 150 175 200m
SCALE

WHITE PINE COPPER
Foth

TEMPORARY ORE STOCKPILE

WHITE PINE COPPER
ONTONAGON COUNTY, MICHIGAN

REVISIONS			
NO.	BY	DATE	DESCRIPTION
1			
2			
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	BY	DATE
SURVEYED		
DRAWN	DJM4	MARCH 2026
DESIGNED	DJM4	APRIL 2026
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SHEET TITLE:

PROPOSED ORE PAD AND PIPELINE LAYOUT

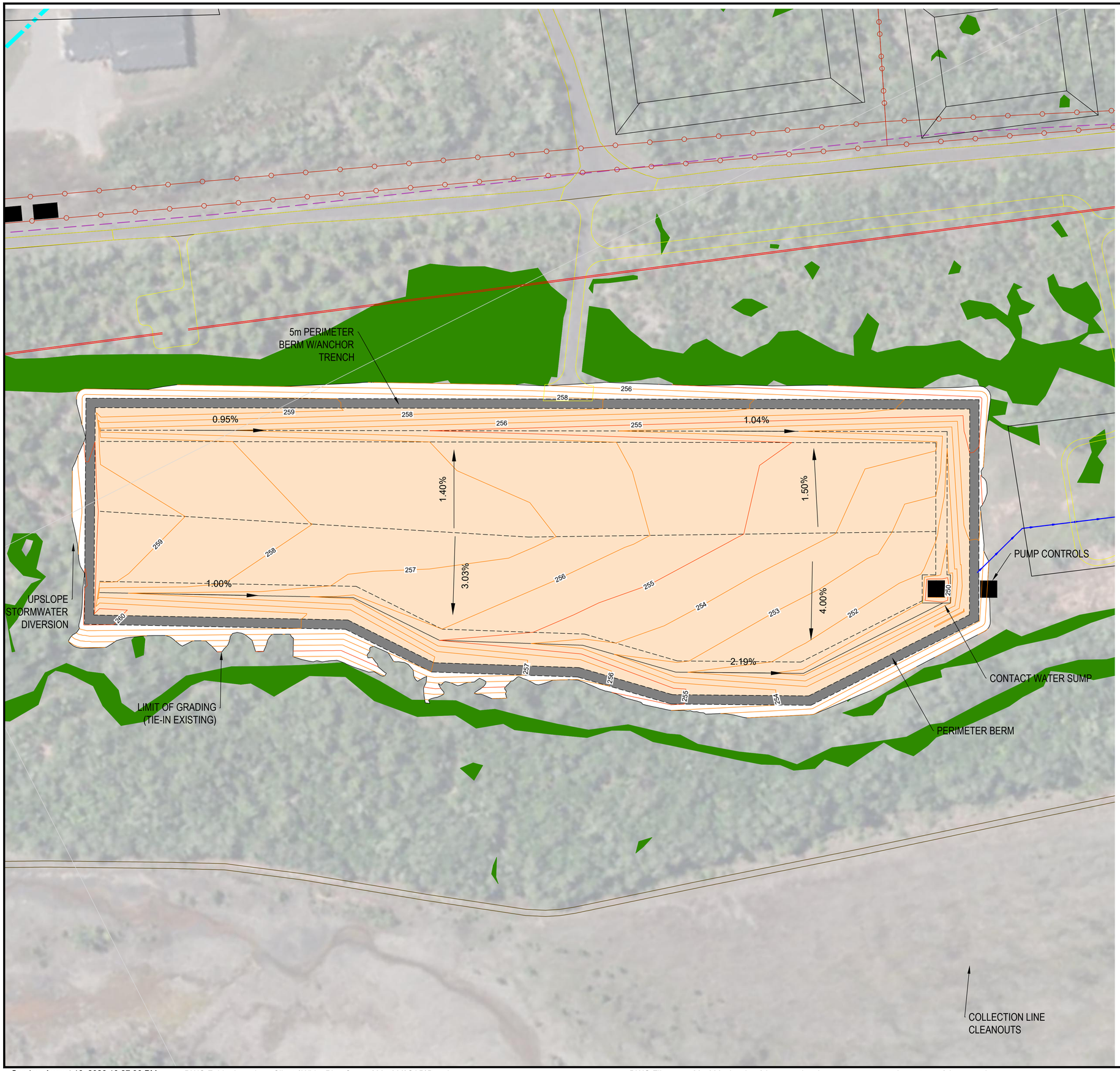
PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

TOP-1

Sunday, August 16, 2026 9:36:38 PM DWG Folder Location: Clients\White Pine Copper\23w200\CAD\Drawings\Ore Pad Design DWG Filename: 23w200_drawing 1 existing conditions.dwg Layout: top-1



NORTH

LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PROPERTY SUBAREA
- EXISTING ROADWAY
- EXISTING/PROPOSED ELECTRIC LINE
- EXISTING DELINEATED WETLAND
- PROPOSED ROAD
- PROPOSED ORE STOCKPILE
- PROPOSED SUMP

NOTES:

1. BASE AIR PHOTO FROM BING MAPS.
2. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
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4. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
5. TOPOGRAPHY RECEIVED FROM AUSENCO BASED ON LIDAR SURVEY.
   CONTOUR INTERVAL = 1m

12.5 0 25 50 150 100m
SCALE

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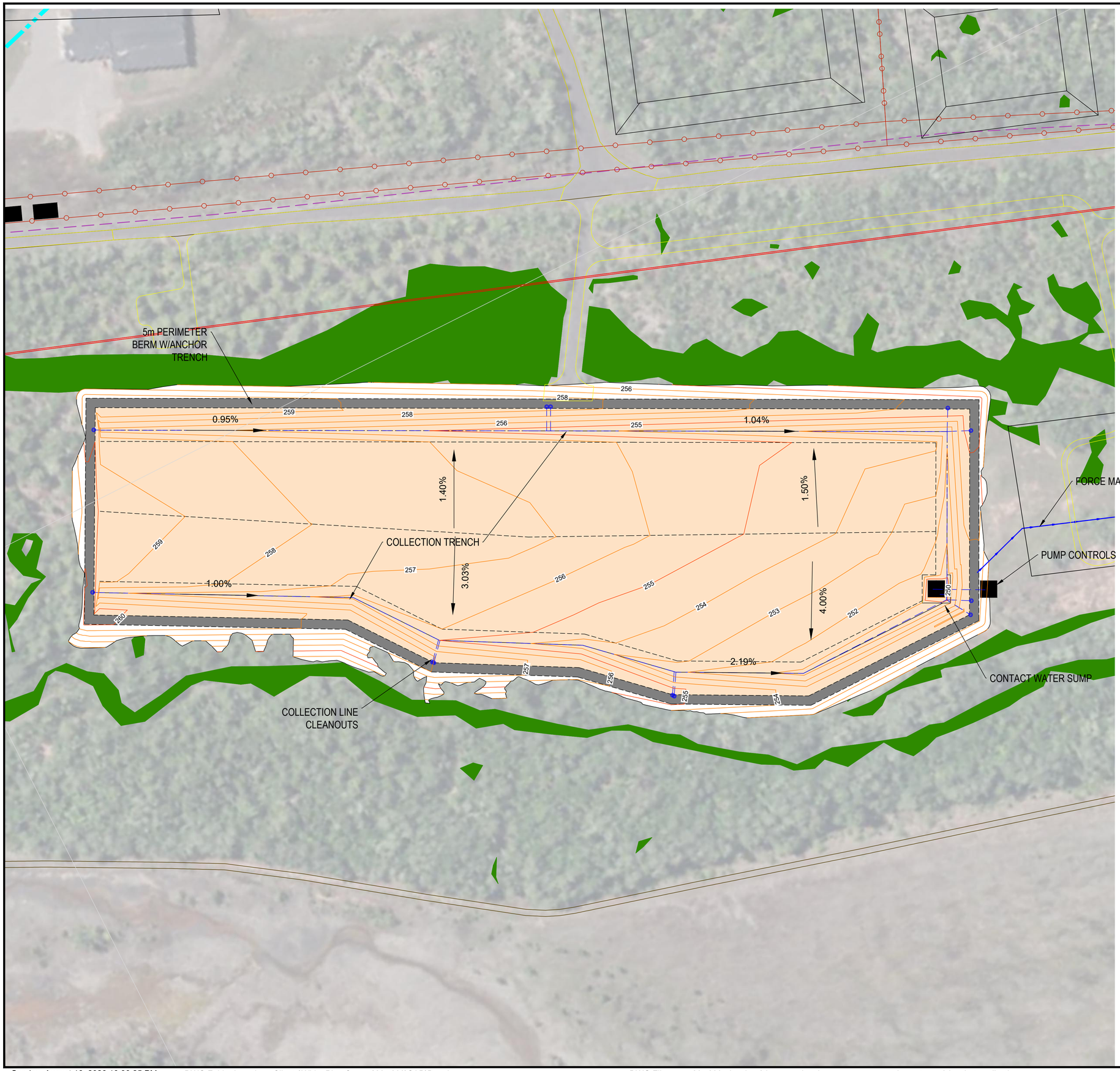
ORE STOCKPILE BASE GRADES

PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

TOP-2



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- APPROXIMATE PROPERTY SUBAREA
- EXISTING ROADWAY
- EXISTING/PROPOSED ELECTRIC LINE
- EXISTING DELINEATED WETLAND
- PROPOSED ROAD
- PROPOSED FORCE MAIN
- PROPOSED ORE STOCKPILE
- PROPOSED SUMP

NOTES:

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2. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
3. HYDROGRAPHIC FROM USGS.
4. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
5. TOPOGRAPHY RECEIVED FROM AUSENCO BASED ON LIDAR SURVEY BY QUANTUM. DATE OF ACQUISITION MAY 2014.
   CONTOUR INTERVAL = 1m

12.5 0 25 50 150 100m
SCALE

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CHECKED		

SHEET TITLE:

LEACHATE COLLECTION SYSTEM LAYOUT

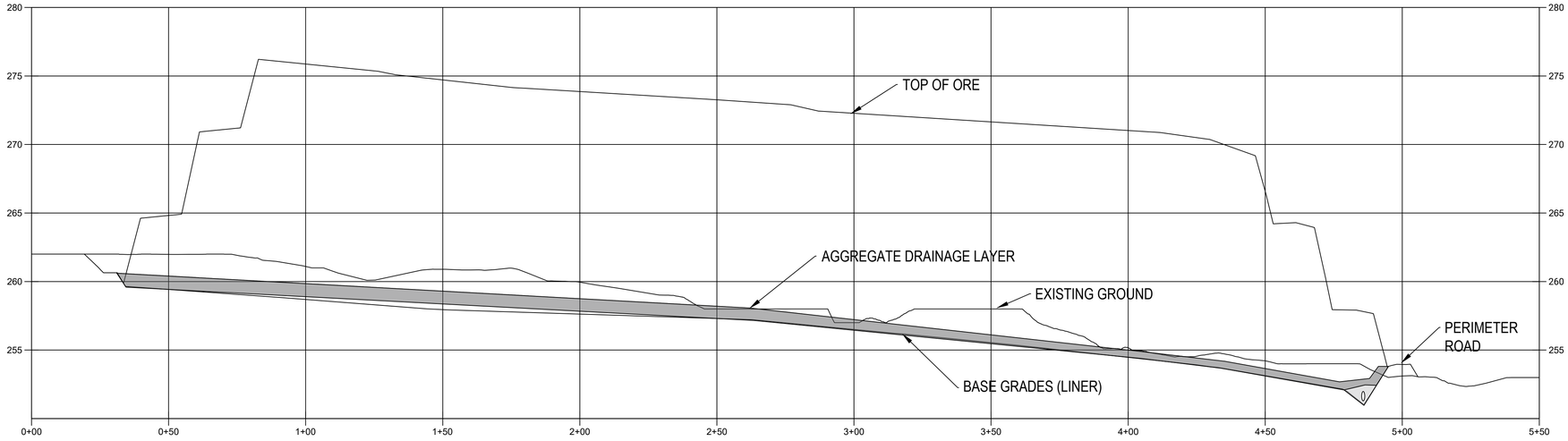
PERMIT APPLICATION

PROJECT NO: 23W200

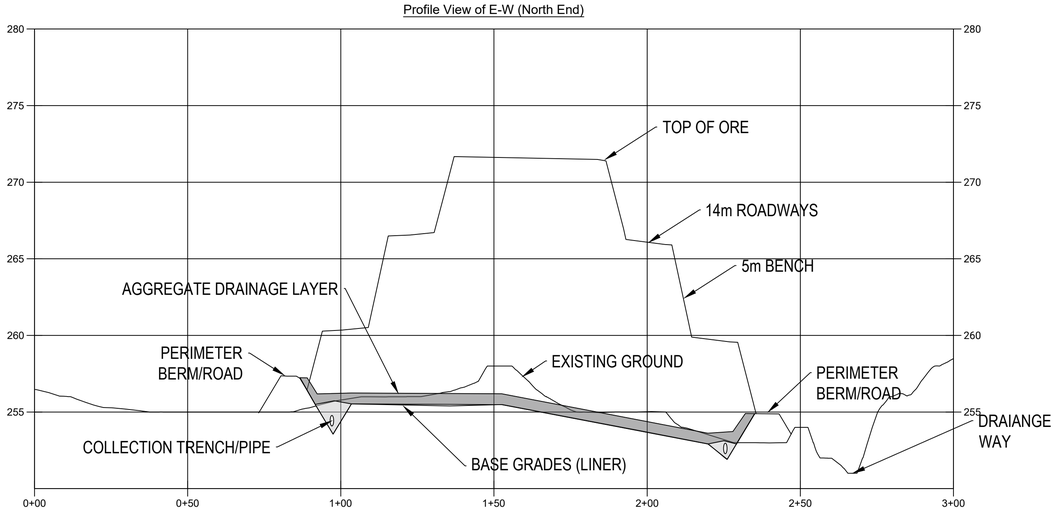
SHEET NUMBER

TOP-3

PROFILE VIEW NORTH TO SOUTH



Profile View of E-W (North End)





LOCATION MAP (1:2500)

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SHEET TITLE:

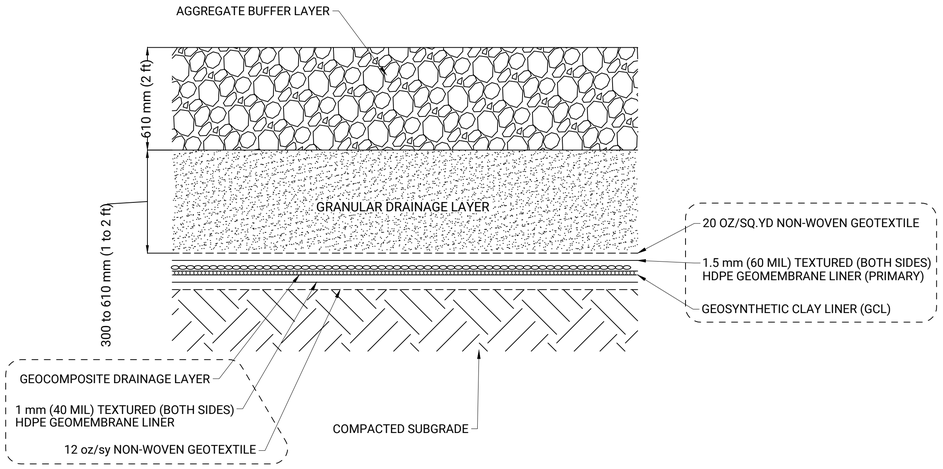
CROSS SECTIONS

PERMIT APPLICATION

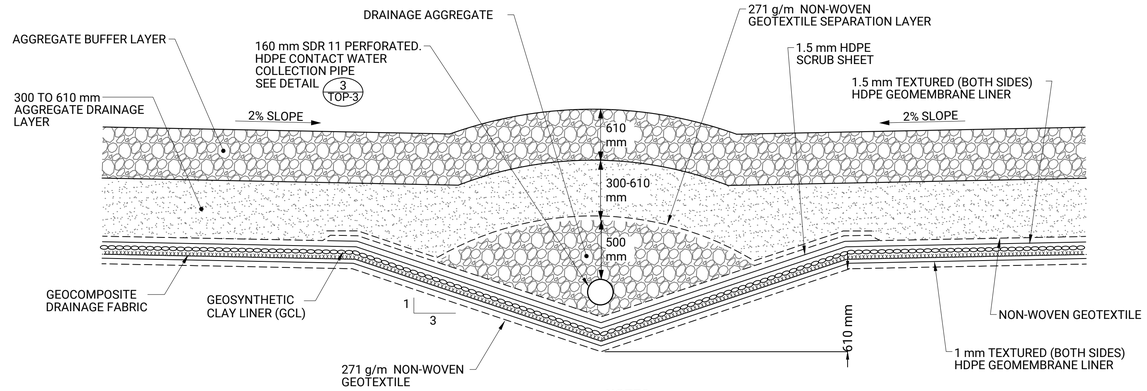
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SHEET NUMBER

TOP-4



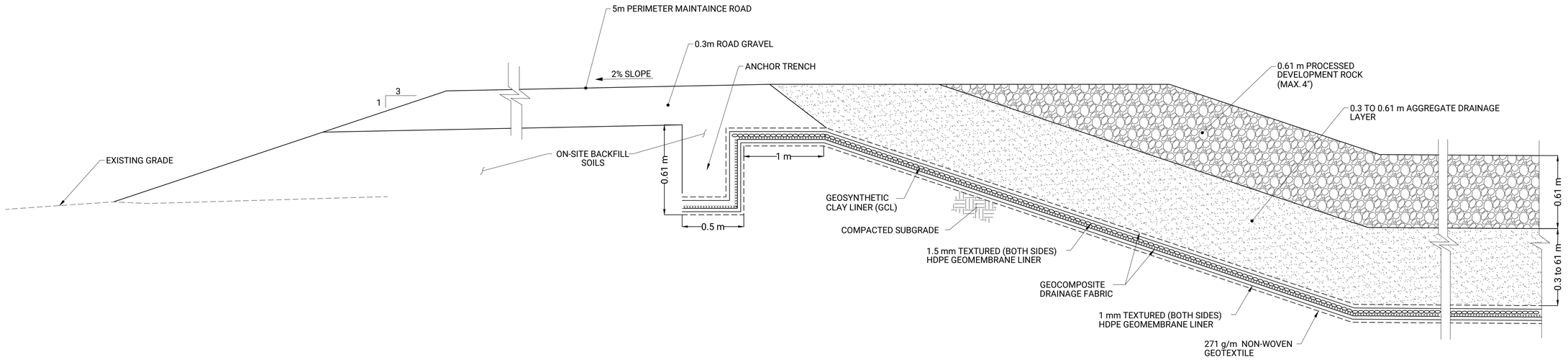
LINER DETAIL (TYP.)



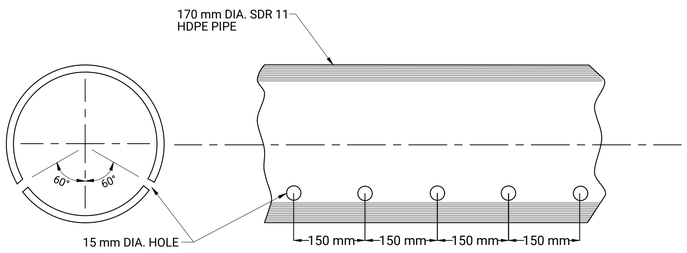
NOTES:

1. SAND DRAINAGE LAYER WILL HAVE A MINIMUM HYDRAULIC CONDUCTIVITY OF 1 x 10 cm/sec (0.7 THICK) AND SHALL CONSIST OF ON SITE SOILS HAVING A P200 < 5%.
2. GEOCOMPOSITE (GEONET) WILL HAVE A TRANSMISSIVITY OF NOT LESS THAN 1 x 10 m /sec.
3. DRAINAGE AGGREGATE WILL BE WASHED. HAVING A MINIMUM HYDRAULIC CONDUCTIVITY OF 1 x 10 cm/sec.
4. SUBGRADE WILL BE COMPACTED TO 95% MAXIMUM DRY DENSITY AS DETERMINED BY STANDARD PROCTOR. OWNERS REPRESENTATIVE SHALL CONDUCT FIELD DENSITY TESTING.
5. INSTALL 60 MIL HDPE SCRUB SHEET BELOW GEOCOMPOSITE IN TRENCH. DO NOT WELD TO PRIMARY GEOMEMBRANE LINER.

COLLECTION TRENCH DETAIL (TYP.)



PERIMETER BERM DETAIL (TYP.)



PIPE PERFORATION DETAIL (TYP.)

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TEMPORARY ORE STOCKPILE PLAN

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ONTONAGON COUNTY, MICHIGAN

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DESIGNED	DJM4	APRIL 2026
CHECKED		

SHEET TITLE:

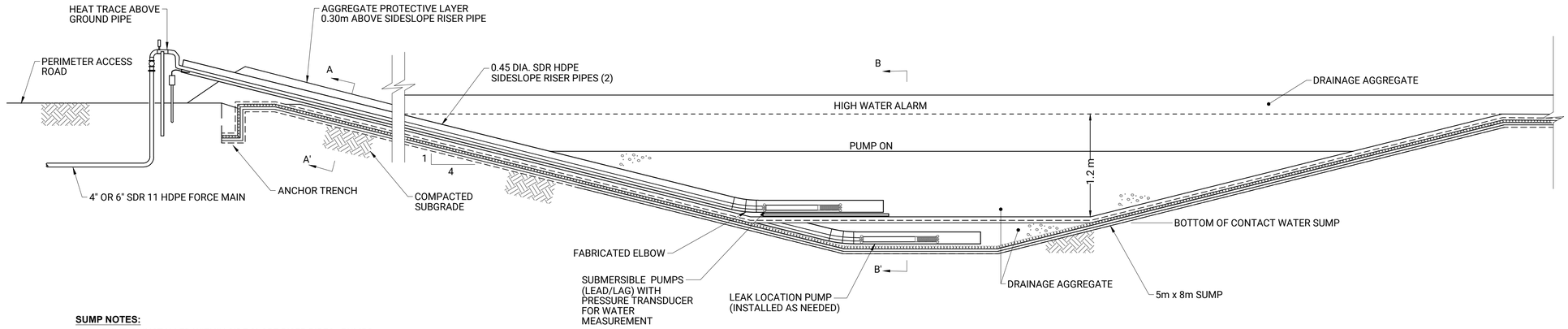
DETAILS

PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

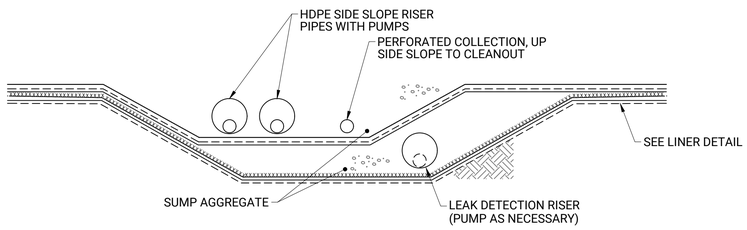
TOP-5



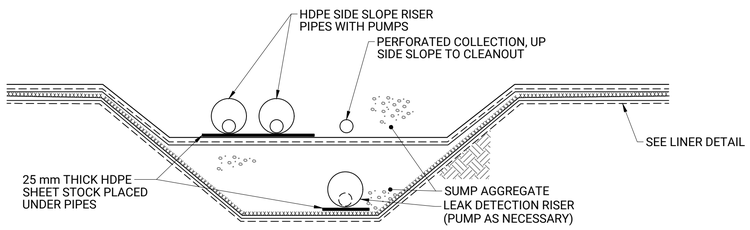
SUMP NOTES:

1) PUMP(S) INSTALLED WITHIN SIDE SLOPE RISER PIPES. PUMPS TO INCLUDE WHEELED DOLLEY WITH DISCHARGE ADAPTER. PUMP TO BE OUTFITTED WITH PRESSURE TRANDUCER FOR LEVEL MEASUREMENT.
2) PUMP CONTROL PANEL TO BE MOUNTED AT TOP OF BERM ADJACENT TO P UMP DISCHARGE. PUMP CONTROL PANEL TO INTERFACE WITH EACH PUMPING SYSTEM.
3) ABOVE GROUND PIPING SUBJECT TO FREEZING SHALL BE HEAT TRACED AND INSULATED.

CONTACT WATER COLLECTION SUMP DETAIL



SECTION A-A'



SECTION B-B'

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NO.	BY	DATE	DESCRIPTION
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DESIGNED	DJM4	APRIL 2026
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SHEET TITLE:

DETAILS

PERMIT APPLICATION

PROJECT NO: 23W200

SHEET NUMBER

TOP-6

Attachment 1
HELP Model Output

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: WPC-Ore Pad Liner **Simulated On:** 4/1/2026 23:23

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)

G - Gravel

Material Texture Number 21

Thickness	=	354	inches
Porosity	=	0.397	vol/vol
Field Capacity	=	0.032	vol/vol
Wilting Point	=	0.013	vol/vol
Initial Soil Water Content	=	0.0662	vol/vol
Effective Sat. Hyd. Conductivity	=	3.00E-01	cm/sec

Layer 2

Type 1 - Vertical Percolation Layer

G - Gravel

Material Texture Number 21

Thickness	=	24	inches
Porosity	=	0.397	vol/vol
Field Capacity	=	0.032	vol/vol
Wilting Point	=	0.013	vol/vol
Initial Soil Water Content	=	0.0725	vol/vol
Effective Sat. Hyd. Conductivity	=	3.00E-01	cm/sec

Layer 3

Type 2 - Lateral Drainage Layer

G - Gravel

Material Texture Number 21

Thickness	=	24	inches
Porosity	=	0.397	vol/vol
Field Capacity	=	0.032	vol/vol
Wilting Point	=	0.013	vol/vol
Initial Soil Water Content	=	0.0557	vol/vol
Effective Sat. Hyd. Conductivity	=	3.00E-01	cm/sec
Slope	=	3	%
Drainage Length	=	300	ft

Layer 4

Type 4 - Flexible Membrane Liner

HDPE Membrane

Material Texture Number 35

Thickness	=	0.06	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	2	Holes/Acre
FML Installation Defects	=	2	Holes/Acre
FML Placement Quality	=	2	Excellent

Layer 5

Type 3 - Barrier Soil Liner

Bentonite (High)

Material Texture Number 17

Thickness	=	0.4	inches
Porosity	=	0.75	vol/vol
Field Capacity	=	0.747	vol/vol
Wilting Point	=	0.4	vol/vol
Initial Soil Water Content	=	0.75	vol/vol
Effective Sat. Hyd. Conductivity	=	3.00E-09	cm/sec

Layer 6

Type 2 - Lateral Drainage Layer

Drainage Net (0.5 cm)

Material Texture Number 20

Thickness	=	0.2	inches
Porosity	=	0.85	vol/vol
Field Capacity	=	0.01	vol/vol
Wilting Point	=	0.005	vol/vol
Initial Soil Water Content	=	0.01	vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E+01	cm/sec
Slope	=	2	%
Drainage Length	=	150	ft

Layer 7

Type 4 - Flexible Membrane Liner

HDPE Membrane

Material Texture Number 35

Thickness	=	0.04	inches
Effective Sat. Hyd. Conductivity	=	2.00E-13	cm/sec
FML Pinhole Density	=	2	Holes/Acre

FML Installation Defects	=	2	Holes/Acre
FML Placement Quality	=	3	Good

Note: Initial moisture content of the layers and snow water were computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	50	
Fraction of Area Allowing Runoff	=	0	%
Area projected on a horizontal plane	=	7.5	acres
Evaporative Zone Depth	=	6	inches
Initial Water in Evaporative Zone	=	0.359	inches
Upper Limit of Evaporative Storage	=	2.382	inches
Lower Limit of Evaporative Storage	=	0.078	inches
Initial Snow Water	=	5.193918	inches
Initial Water in Layer Materials	=	26.82	inches
Total Initial Water	=	32.014	inches
Total Subsurface Inflow	=	0	inches/year

Note: SCS Runoff Curve Number was User-Specified.

Evapotranspiration and Weather Data

Station Latitude	=	46.71	Degrees
Maximum Leaf Area Index	=	4	
Start of Growing Season (Julian Date)	=	141	days
End of Growing Season (Julian Date)	=	278	days
Average Wind Speed	=	2.89	mph
Average 1st Quarter Relative Humidity	=	84	%
Average 2nd Quarter Relative Humidity	=	81	%
Average 3rd Quarter Relative Humidity	=	81	%
Average 4th Quarter Relative Humidity	=	82	%

Note: Evapotranspiration data was obtained for White Pine, Michigan

Normal Mean Monthly Precipitation (inches)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
1.828846	1.588846	2.319615	3.591154	3.695385	4.092692
3.696923	3.806923	3.777692	3.981923	3.053846	2.6

Note: Precipitation was simulated using NOAA data for the following weather stations:
IRONWOOD, MI US, ONTONAGON 8 WSW, MI US, ONTONAGON 12.5 WSW, MI US

Normal Mean Monthly Temperature (Degrees Fahrenheit)

Jan/Jul	Feb/Aug	Mar/Sep	Apr/Oct	May/Nov	Jun/Dec
11.1	10.5	21	32.4	46.4	56.5
60.8	57.8	51.1	39.7	28.5	16.8

Note: Temperature was simulated using NOAA data for the following weather stations:
IRONWOOD, MI US, ONTONAGON 8 WSW, MI US, ONTONAGON 12.5 WSW, MI US
Solar radiation was simulated based on HELP V4 weather simulation for:
Lat/Long: 46.71/-89.71

Daily Output for Year 1

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 7
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 6
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 7

Title: WPC-Ore Pad Liner
Simulated On: 4/1/2026 23:24

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1	*	*	0.00	0.000	0.000	0.0598	0.2120	0.0360	2.67E-08	0.0000	0.0000	2.65E-08
2	*	*	0.01	0.000	0.000	0.0598	0.2102	0.0357	2.65E-08	0.0000	0.0000	2.63E-08
3	*	*	0.07	0.000	0.000	0.0598	0.2084	0.0354	2.63E-08	0.0000	0.0000	2.60E-08
4	*	*	0.01	0.000	0.000	0.0598	0.2065	0.0351	2.61E-08	0.0000	0.0000	2.58E-08
5	*	*	0.04	0.000	0.004	0.0598	0.2047	0.0348	2.58E-08	0.0000	0.0000	2.56E-08
6	*	*	0.06	0.000	0.000	0.0598	0.2029	0.0345	2.56E-08	0.0000	0.0000	2.54E-08
7	*	*	0.08	0.000	0.003	0.0598	0.2011	0.0342	2.54E-08	0.0000	0.0000	2.51E-08
8	*	*	0.00	0.000	0.000	0.0598	0.1993	0.0339	2.51E-08	0.0000	0.0000	2.49E-08
9	*	*	0.00	0.000	0.005	0.0598	0.1975	0.0336	2.49E-08	0.0000	0.0000	2.47E-08
10		*	0.33	0.000	0.000	0.0598	0.1957	0.0333	2.47E-08	0.0000	0.0000	2.45E-08
11	*	*	0.09	0.000	0.006	0.0598	0.1939	0.0330	2.45E-08	0.0000	0.0000	2.42E-08
12	*	*	0.03	0.000	0.003	0.0598	0.1922	0.0327	2.42E-08	0.0000	0.0000	2.40E-08
13	*	*	0.00	0.000	0.005	0.0598	0.1904	0.0324	2.40E-08	0.0000	0.0000	2.38E-08
14	*	*	0.01	0.000	0.004	0.0598	0.1887	0.0321	2.38E-08	0.0000	0.0000	2.36E-08
15	*	*	0.00	0.000	0.000	0.0598	0.1870	0.0318	2.36E-08	0.0000	0.0000	2.34E-08
16	*	*	0.01	0.000	0.005	0.0598	0.1853	0.0315	2.34E-08	0.0000	0.0000	2.32E-08
17	*	*	0.00	0.000	0.005	0.0598	0.1837	0.0312	2.32E-08	0.0000	0.0000	2.30E-08
18	*	*	0.06	0.000	0.000	0.0598	0.1820	0.0309	2.29E-08	0.0000	0.0000	2.27E-08
19	*	*	0.00	0.000	0.005	0.0598	0.1804	0.0307	2.27E-08	0.0000	0.0000	2.25E-08
20	*	*	0.23	0.000	0.003	0.0598	0.1788	0.0304	2.25E-08	0.0000	0.0000	2.23E-08
21	*	*	0.05	0.000	0.002	0.0598	0.1772	0.0301	2.23E-08	0.0000	0.0000	2.21E-08
22	*	*	0.01	0.000	0.000	0.0598	0.1757	0.0299	2.21E-08	0.0000	0.0000	2.19E-08
23	*	*	0.08	0.000	0.003	0.0598	0.1741	0.0296	2.19E-08	0.0000	0.0000	2.18E-08
24	*	*	0.00	0.000	0.003	0.0598	0.1726	0.0293	2.18E-08	0.0000	0.0000	2.16E-08
25	*	*	0.09	0.000	0.000	0.0598	0.1711	0.0291	2.16E-08	0.0000	0.0000	2.14E-08
26	*	*	0.08	0.000	0.000	0.0598	0.1696	0.0288	2.14E-08	0.0000	0.0000	2.12E-08

27	*	*	0.00	0.000	0.002	0.0598	0.1682	0.0286	2.12E-08	0.0000	0.0000	2.10E-08
28	*	*	0.00	0.000	0.002	0.0598	0.1667	0.0283	2.10E-08	0.0000	0.0000	2.08E-08
29	*	*	0.00	0.000	0.002	0.0598	0.1653	0.0281	2.08E-08	0.0000	0.0000	2.07E-08
30	*	*	0.00	0.000	0.003	0.0598	0.1639	0.0278	2.06E-08	0.0000	0.0000	2.05E-08
31	*	*	0.00	0.000	0.000	0.0598	0.1625	0.0276	2.05E-08	0.0000	0.0000	2.03E-08
32	*	*	0.03	0.000	0.000	0.0598	0.1611	0.0274	2.03E-08	0.0000	0.0000	2.01E-08
33	*	*	0.00	0.000	0.000	0.0598	0.1598	0.0272	2.01E-08	0.0000	0.0000	2.00E-08
34	*	*	0.07	0.000	0.000	0.0598	0.1585	0.0269	2.00E-08	0.0000	0.0000	1.98E-08
35	*	*	0.27	0.000	0.000	0.0598	0.1572	0.0267	1.98E-08	0.0000	0.0000	1.96E-08
36	*	*	0.00	0.000	0.006	0.0598	0.1559	0.0265	1.96E-08	0.0000	0.0000	1.95E-08
37	*	*	0.00	0.000	0.004	0.0598	0.1546	0.0263	1.95E-08	0.0000	0.0000	1.93E-08
38	*	*	0.02	0.000	0.000	0.0598	0.1533	0.0261	1.93E-08	0.0000	0.0000	1.92E-08
39	*	*	0.00	0.000	0.006	0.0598	0.1521	0.0258	1.92E-08	0.0000	0.0000	1.90E-08
40	*	*	0.00	0.000	0.000	0.0598	0.1509	0.0256	1.90E-08	0.0000	0.0000	1.88E-08
41	*	*	0.13	0.000	0.006	0.0598	0.1496	0.0254	1.88E-08	0.0000	0.0000	1.87E-08
42	*	*	0.13	0.000	0.003	0.0598	0.1485	0.0252	1.87E-08	0.0000	0.0000	1.85E-08
43	*	*	0.00	0.000	0.002	0.0598	0.1473	0.0250	1.85E-08	0.0000	0.0000	1.84E-08
44	*	*	0.15	0.000	0.000	0.0598	0.1461	0.0248	1.84E-08	0.0000	0.0000	1.83E-08
45	*	*	0.00	0.000	0.002	0.0598	0.1450	0.0246	1.83E-08	0.0000	0.0000	1.81E-08
46	*	*	0.00	0.000	0.000	0.0598	0.1438	0.0244	1.81E-08	0.0000	0.0000	1.80E-08
47	*	*	0.55	0.000	0.000	0.0598	0.1427	0.0243	1.80E-08	0.0000	0.0000	1.78E-08
48	*	*	0.00	0.000	0.003	0.0598	0.1416	0.0241	1.78E-08	0.0000	0.0000	1.77E-08
49	*	*	0.00	0.000	0.000	0.0598	0.1405	0.0239	1.77E-08	0.0000	0.0000	1.76E-08
50	*	*	0.00	0.000	0.000	0.0598	0.1395	0.0237	1.76E-08	0.0000	0.0000	1.74E-08
51	*	*	0.00	0.000	0.005	0.0598	0.1384	0.0235	1.74E-08	0.0000	0.0000	1.73E-08
52	*	*	0.00	0.000	0.000	0.0598	0.1374	0.0233	1.73E-08	0.0000	0.0000	1.72E-08
53	*	*	0.00	0.000	0.000	0.0598	0.1363	0.0232	1.72E-08	0.0000	0.0000	1.70E-08
54	*	*	0.00	0.000	0.000	0.0598	0.1353	0.0230	1.70E-08	0.0000	0.0000	1.69E-08
55		*	0.11	0.000	0.000	0.0982	0.1343	0.0228	1.69E-08	0.0000	0.0000	1.68E-08
56		*	0.00	0.000	0.000	0.2006	0.1333	0.0227	1.68E-08	0.0000	0.0000	1.67E-08
57		*	0.01	0.000	0.000	0.3456	0.1323	0.0225	1.67E-08	0.0000	0.0000	1.65E-08
58		*	0.03	0.000	0.000	0.3656	0.1314	0.0223	1.65E-08	0.0000	0.0000	1.64E-08
59	*	*	0.00	0.000	0.004	0.3687	0.1304	0.0222	1.64E-08	0.0000	0.0000	1.63E-08
60		*	0.00	0.000	0.000	0.3970	0.1297	0.0220	1.63E-08	0.0000	0.0000	1.62E-08

61	*	*	0.00	0.000	0.000	0.3970	0.1223	0.0208	1.54E-08	0.0000	0.0000	1.53E-08
62	*	*	0.00	0.000	0.006	0.3970	0.1340	0.0228	1.69E-08	0.0000	0.0000	1.67E-08
63	*	*	0.00	0.000	0.006	0.3970	0.1399	0.0238	1.76E-08	0.0000	0.0000	1.75E-08
64		*	0.00	0.000	0.009	0.3970	0.1288	0.0219	1.62E-08	0.0000	0.0000	1.61E-08
65		*	0.00	0.000	0.000	0.3970	0.1162	0.0197	1.46E-08	0.0000	0.0000	1.45E-08
66		*	0.00	0.000	0.000	0.3970	0.1038	0.0176	1.30E-08	0.0000	0.0000	1.30E-08
67		*	0.00	0.000	0.000	0.3970	0.1086	0.0184	1.37E-08	0.0000	0.0000	1.36E-08
68		*	0.00	0.000	0.000	0.3970	0.1184	0.0201	1.49E-08	0.0000	0.0000	1.48E-08
69	*	*	1.64	0.000	0.000	0.3970	0.1273	0.0216	1.60E-08	0.0000	0.0000	1.59E-08
70	*	*	0.05	0.000	0.005	0.3970	0.1362	0.0231	1.71E-08	0.0000	0.0000	1.70E-08
71	*	*	0.00	0.000	0.005	0.3970	0.1397	0.0237	1.76E-08	0.0000	0.0000	1.74E-08
72	*	*	0.00	0.000	0.000	0.3970	0.1335	0.0227	1.68E-08	0.0000	0.0000	1.67E-08
73	*	*	0.00	0.000	0.007	0.3970	0.1300	0.0221	1.64E-08	0.0000	0.0000	1.62E-08
74	*	*	0.03	0.000	0.000	0.3970	0.1207	0.0205	1.52E-08	0.0000	0.0000	1.51E-08
75	*	*	0.52	0.000	0.000	0.3970	0.1273	0.0216	1.60E-08	0.0000	0.0000	1.59E-08
76	*	*	0.06	0.000	0.005	0.3970	0.1383	0.0235	1.74E-08	0.0000	0.0000	1.73E-08
77	*	*	0.00	0.000	0.005	0.3970	0.1554	0.0264	1.96E-08	0.0000	0.0000	1.94E-08
78	*	*	0.00	0.000	0.000	0.3970	0.1629	0.0277	2.05E-08	0.0000	0.0000	2.04E-08
79	*	*	0.00	0.000	0.000	0.3970	0.1509	0.0256	1.90E-08	0.0000	0.0000	1.88E-08
80		*	0.00	0.000	0.000	0.3970	0.1112	0.0189	1.40E-08	0.0000	0.0000	1.39E-08
81		*	0.00	0.000	0.000	0.3970	0.0678	0.0115	8.64E-09	0.0000	0.0000	8.59E-09
82		*	0.00	0.000	0.000	0.3970	0.0557	0.0095	7.77E-09	0.0000	0.0000	7.73E-09
83		*	0.00	0.000	0.000	0.3970	0.0794	0.0135	9.98E-09	0.0000	0.0000	9.92E-09
84		*	0.00	0.000	0.000	0.3970	0.1967	0.0334	2.48E-08	0.0000	0.0000	2.46E-08
85		*	0.11	0.000	0.015	0.3970	0.3449	0.0586	4.37E-08	0.0000	0.0000	4.32E-08
86		*	0.06	0.000	0.002	0.3970	0.4213	0.0716	5.35E-08	0.0000	0.0000	5.27E-08
87		*	0.78	0.000	0.002	0.3970	0.4245	0.0721	5.39E-08	0.0000	0.0000	5.31E-08
88	*	*	0.85	0.000	0.015	0.3970	0.4296	0.0730	5.45E-08	0.0000	0.0000	5.38E-08
89	*	*	0.04	0.000	0.016	0.3970	0.4072	0.0692	5.17E-08	0.0000	0.0000	5.10E-08
90	*	*	0.00	0.000	0.009	0.3970	0.3274	0.0556	4.14E-08	0.0000	0.0000	4.10E-08
91		*	0.00	0.000	0.000	0.3970	0.3150	0.0535	3.98E-08	0.0000	0.0000	3.94E-08
92		*	0.00	0.000	0.032	0.3970	0.3192	0.0542	4.04E-08	0.0000	0.0000	3.99E-08
93		*	0.00	0.000	0.000	0.3970	0.2143	0.0364	2.70E-08	0.0000	0.0000	2.68E-08
94		*	0.05	0.000	0.002	0.3970	0.2880	0.0489	3.64E-08	0.0000	0.0000	3.60E-08

95	*	*	0.07	0.000	0.043	0.3970	0.5151	0.0875	6.55E-08	0.0000	0.0000	6.46E-08
96	*	*	0.00	0.000	0.022	0.3970	0.5182	0.0881	6.59E-08	0.0000	0.0000	6.50E-08
97		*	0.22	0.000	0.029	0.3970	0.3847	0.0654	4.88E-08	0.0000	0.0000	4.82E-08
98	*	*	0.00	0.000	0.000	0.3970	0.5562	0.0945	7.08E-08	0.0000	0.0000	6.98E-08
99	*	*	0.00	0.000	0.000	0.3970	0.8482	0.1441	1.09E-07	0.0000	0.0000	1.07E-07
100		*	0.00	0.000	0.000	0.3970	0.9776	0.1661	1.26E-07	0.0000	0.0000	1.23E-07
101	*	*	0.00	0.000	0.000	0.3970	0.9134	0.1552	1.17E-07	0.0000	0.0000	1.15E-07
102	*	*	0.07	0.000	0.040	0.3970	0.8989	0.1527	1.15E-07	0.0000	0.0000	1.13E-07
103	*	*	0.02	0.000	0.022	0.3970	0.9402	0.1598	1.21E-07	0.0000	0.0000	1.18E-07
104		*	0.08	0.000	0.000	0.3970	0.9781	0.1662	1.26E-07	0.0000	0.0000	1.23E-07
105		*	0.00	0.000	0.028	0.3970	0.9962	0.1693	1.28E-07	0.0000	0.0000	1.26E-07
106	*	*	0.27	0.000	0.012	0.3970	1.0027	0.1704	1.29E-07	0.0000	0.0000	1.26E-07
107	*	*	0.07	0.000	0.012	0.3970	1.0129	0.1721	1.30E-07	0.0000	0.0000	1.28E-07
108	*	*	0.15	0.000	0.025	0.3970	0.9715	0.1651	1.25E-07	0.0000	0.0000	1.22E-07
109		*	0.04	0.000	0.000	0.3970	0.9225	0.1568	1.19E-07	0.0000	0.0000	1.16E-07
110		*	0.00	0.000	0.072	0.3970	0.8903	0.1513	1.14E-07	0.0000	0.0000	1.12E-07
111		*	0.23	0.000	0.002	0.3970	0.8456	0.1437	1.08E-07	0.0000	0.0000	1.06E-07
112	*	*	0.06	0.000	0.049	0.3970	0.8838	0.1502	1.13E-07	0.0000	0.0000	1.11E-07
113	*	*	0.00	0.000	0.011	0.3970	0.8384	0.1425	1.08E-07	0.0000	0.0000	1.06E-07
114		*	0.02	0.000	0.002	0.3970	0.7817	0.1328	1.00E-07	0.0000	0.0000	9.83E-08
115		*	0.00	0.000	0.000	0.3970	0.7370	0.1252	9.43E-08	0.0000	0.0000	9.26E-08
116		*	0.00	0.000	0.000	0.3970	0.6574	0.1117	8.39E-08	0.0000	0.0000	8.25E-08
117		*	0.00	0.000	0.000	0.3970	0.4694	0.0798	5.96E-08	0.0000	0.0000	5.88E-08
118		*	0.00	0.000	0.000	0.3970	0.3153	0.0536	3.99E-08	0.0000	0.0000	3.95E-08
119		*	0.00	0.000	0.000	0.3970	0.3453	0.0587	4.37E-08	0.0000	0.0000	4.32E-08
120		*	0.01	0.000	0.002	0.3970	0.4591	0.0780	5.83E-08	0.0000	0.0000	5.75E-08
121		*	0.00	0.000	0.000	0.3970	0.5588	0.0950	7.12E-08	0.0000	0.0000	7.01E-08
122		*	0.16	0.000	0.002	0.3970	0.6157	0.1046	7.85E-08	0.0000	0.0000	7.73E-08
123		*	0.00	0.000	0.000	0.3970	0.6674	0.1134	8.52E-08	0.0000	0.0000	8.38E-08
124		*	0.00	0.000	0.000	0.3970	0.6711	0.1140	8.57E-08	0.0000	0.0000	8.43E-08
125		*	0.00	0.000	0.000	0.3970	0.7092	0.1205	9.07E-08	0.0000	0.0000	8.91E-08
126		*	0.00	0.000	0.000	0.3970	0.7035	0.1195	8.99E-08	0.0000	0.0000	8.84E-08
127			0.00	0.000	0.042	0.0130	0.6637	0.1128	8.47E-08	0.0000	0.0000	8.33E-08
128			0.00	0.000	0.000	0.0130	0.5693	0.0967	7.25E-08	0.0000	0.0000	7.14E-08

129		0.47	0.000	0.081	0.0779	0.6305	0.1071	8.04E-08	0.0000	0.0000	7.91E-08
130		0.18	0.000	0.145	0.0562	0.4932	0.0838	6.27E-08	0.0000	0.0000	6.18E-08
131		0.00	0.000	0.123	0.0357	0.6086	0.1034	7.76E-08	0.0000	0.0000	7.64E-08
132		0.11	0.000	0.159	0.0256	0.8072	0.1372	1.03E-07	0.0000	0.0000	1.02E-07
133		0.02	0.000	0.046	0.0212	0.9168	0.1558	1.18E-07	0.0000	0.0000	1.15E-07
134		0.04	0.000	0.049	0.0198	0.9290	0.1579	1.19E-07	0.0000	0.0000	1.17E-07
135		0.17	0.000	0.022	0.0444	0.9315	0.1583	1.20E-07	0.0000	0.0000	1.17E-07
136		0.00	0.000	0.050	0.0360	0.9146	0.1554	1.17E-07	0.0000	0.0000	1.15E-07
137		0.00	0.000	0.123	0.0155	0.8928	0.1517	1.15E-07	0.0000	0.0000	1.12E-07
138		0.00	0.000	0.014	0.0131	0.8730	0.1483	1.12E-07	0.0000	0.0000	1.10E-07
139		0.00	0.000	0.001	0.0130	0.8543	0.1452	1.10E-07	0.0000	0.0000	1.08E-07
140	*	0.00	0.000	0.000	0.0130	0.8357	0.1420	1.07E-07	0.0000	0.0000	1.05E-07
141		0.00	0.000	0.000	0.0130	0.8177	0.1389	1.05E-07	0.0000	0.0000	1.03E-07
142		0.00	0.000	0.000	0.0130	0.7977	0.1356	1.02E-07	0.0000	0.0000	1.00E-07
143		0.36	0.000	0.019	0.0698	0.7770	0.1320	9.95E-08	0.0000	0.0000	9.77E-08
144		0.07	0.000	0.072	0.0445	0.7565	0.1285	9.68E-08	0.0000	0.0000	9.51E-08
145		0.05	0.000	0.049	0.0446	0.7380	0.1254	9.44E-08	0.0000	0.0000	9.28E-08
146		0.06	0.000	0.099	0.0375	0.7096	0.1206	9.07E-08	0.0000	0.0000	8.91E-08
147		0.00	0.000	0.043	0.0294	0.7059	0.1199	9.02E-08	0.0000	0.0000	8.87E-08
148		0.00	0.000	0.081	0.0139	0.6879	0.1169	8.79E-08	0.0000	0.0000	8.64E-08
149		0.35	0.000	0.061	0.0620	0.6485	0.1102	8.28E-08	0.0000	0.0000	8.14E-08
150		0.00	0.000	0.050	0.0429	0.6016	0.1022	7.67E-08	0.0000	0.0000	7.55E-08
151		0.00	0.000	0.076	0.0222	0.5782	0.0982	7.37E-08	0.0000	0.0000	7.25E-08
152		0.03	0.000	0.057	0.0159	0.5725	0.0973	7.29E-08	0.0000	0.0000	7.18E-08
153		0.00	0.000	0.012	0.0138	0.5420	0.0921	6.90E-08	0.0000	0.0000	6.80E-08
154		0.24	0.000	0.024	0.0498	0.5372	0.0913	6.84E-08	0.0000	0.0000	6.74E-08
155		0.00	0.000	0.078	0.0367	0.5530	0.0940	7.04E-08	0.0000	0.0000	6.93E-08
156		0.00	0.000	0.036	0.0307	0.5390	0.0916	6.86E-08	0.0000	0.0000	6.76E-08
157		0.00	0.000	0.032	0.0253	0.5033	0.0855	6.40E-08	0.0000	0.0000	6.31E-08
158		0.00	0.000	0.023	0.0198	0.4641	0.0789	5.89E-08	0.0000	0.0000	5.81E-08
159		0.00	0.000	0.027	0.0139	0.4362	0.0741	5.54E-08	0.0000	0.0000	5.46E-08
160		0.50	0.000	0.025	0.0931	0.4259	0.0724	5.40E-08	0.0000	0.0000	5.33E-08
161		0.00	0.000	0.044	0.0462	0.4124	0.0701	5.23E-08	0.0000	0.0000	5.16E-08
162		0.00	0.000	0.161	0.0130	0.4228	0.0719	5.37E-08	0.0000	0.0000	5.29E-08

163	0.22	0.000	0.057	0.0401	0.4418	0.0751	5.61E-08	0.0000	0.0000	5.53E-08
164	0.00	0.000	0.098	0.0238	0.4169	0.0708	5.29E-08	0.0000	0.0000	5.22E-08
165	0.00	0.000	0.047	0.0159	0.4623	0.0786	5.87E-08	0.0000	0.0000	5.79E-08
166	0.05	0.000	0.019	0.0211	0.4901	0.0833	6.23E-08	0.0000	0.0000	6.14E-08
167	0.28	0.000	0.022	0.0642	0.4754	0.0808	6.04E-08	0.0000	0.0000	5.96E-08
168	0.98	0.000	0.046	0.1985	0.4329	0.0736	5.49E-08	0.0000	0.0000	5.42E-08
169	0.13	0.000	0.162	0.0458	0.3628	0.0616	4.60E-08	0.0000	0.0000	4.54E-08
170	0.01	0.000	0.101	0.0303	0.3278	0.0557	4.15E-08	0.0000	0.0000	4.10E-08
171	0.26	0.000	0.174	0.0436	0.2491	0.0423	3.15E-08	0.0000	0.0000	3.11E-08
172	0.80	0.000	0.181	0.1468	0.2044	0.0347	2.58E-08	0.0000	0.0000	2.55E-08
173	0.36	0.000	0.172	0.1038	0.2685	0.0456	3.39E-08	0.0000	0.0000	3.36E-08
174	0.47	0.000	0.204	0.0969	0.3406	0.0579	4.31E-08	0.0000	0.0000	4.26E-08
175	0.50	0.000	0.099	0.1145	0.3960	0.0673	5.02E-08	0.0000	0.0000	4.96E-08
176	0.05	0.000	0.188	0.0340	0.3377	0.0574	4.28E-08	0.0000	0.0000	4.22E-08
177	0.00	0.000	0.106	0.0159	0.2652	0.0451	3.35E-08	0.0000	0.0000	3.32E-08
178	0.40	0.000	0.057	0.0731	0.2455	0.0417	3.10E-08	0.0000	0.0000	3.07E-08
179	0.00	0.000	0.128	0.0297	0.2409	0.0409	3.04E-08	0.0000	0.0000	3.01E-08
180	0.00	0.000	0.090	0.0148	0.2539	0.0431	3.21E-08	0.0000	0.0000	3.17E-08
181	0.02	0.000	0.025	0.0140	0.2901	0.0493	3.67E-08	0.0000	0.0000	3.63E-08
182	0.00	0.000	0.003	0.0134	0.3047	0.0518	3.85E-08	0.0000	0.0000	3.81E-08
183	0.00	0.000	0.002	0.0131	0.3025	0.0514	3.83E-08	0.0000	0.0000	3.78E-08
184	1.35	0.000	0.063	0.2276	0.2580	0.0438	3.26E-08	0.0000	0.0000	3.23E-08
185	0.16	0.000	0.154	0.0348	0.1707	0.0290	2.15E-08	0.0000	0.0000	2.13E-08
186	0.00	0.000	0.061	0.0246	0.1163	0.0198	1.46E-08	0.0000	0.0000	1.45E-08
187	0.00	0.000	0.059	0.0139	0.1861	0.0316	2.35E-08	0.0000	0.0000	2.33E-08
188	0.00	0.000	0.004	0.0132	0.4169	0.0708	5.29E-08	0.0000	0.0000	5.22E-08
189	0.00	0.000	0.001	0.0130	0.5340	0.0907	6.80E-08	0.0000	0.0000	6.69E-08
190	1.43	0.000	0.160	0.2246	0.4788	0.0814	6.08E-08	0.0000	0.0000	6.00E-08
191	0.31	0.000	0.186	0.0558	0.3431	0.0583	4.34E-08	0.0000	0.0000	4.29E-08
192	0.00	0.000	0.052	0.0424	0.3471	0.0590	4.40E-08	0.0000	0.0000	4.34E-08
193	0.00	0.000	0.056	0.0307	0.5278	0.0897	6.72E-08	0.0000	0.0000	6.62E-08
194	0.00	0.000	0.050	0.0192	0.6793	0.1154	8.68E-08	0.0000	0.0000	8.53E-08
195	0.07	0.000	0.051	0.0207	0.6861	0.1166	8.76E-08	0.0000	0.0000	8.62E-08
196	0.00	0.000	0.031	0.0156	0.5275	0.0896	6.71E-08	0.0000	0.0000	6.61E-08

197	0.00	0.000	0.012	0.0136	0.4409	0.0749	5.60E-08	0.0000	0.0000	5.52E-08
198	0.00	0.000	0.003	0.0132	0.5448	0.0926	6.93E-08	0.0000	0.0000	6.83E-08
199	0.00	0.000	0.000	0.0130	0.6636	0.1128	8.47E-08	0.0000	0.0000	8.33E-08
200	0.00	0.000	0.000	0.0130	0.7528	0.1279	9.63E-08	0.0000	0.0000	9.46E-08
201	0.00	0.000	0.000	0.0130	0.8102	0.1377	1.04E-07	0.0000	0.0000	1.02E-07
202	0.08	0.000	0.021	0.0228	0.8416	0.1430	1.08E-07	0.0000	0.0000	1.06E-07
203	0.00	0.000	0.034	0.0171	0.8532	0.1450	1.09E-07	0.0000	0.0000	1.07E-07
204	0.02	0.000	0.025	0.0162	0.8518	0.1447	1.09E-07	0.0000	0.0000	1.07E-07
205	0.00	0.000	0.014	0.0138	0.8420	0.1431	1.08E-07	0.0000	0.0000	1.06E-07
206	0.00	0.000	0.003	0.0131	0.8269	0.1405	1.06E-07	0.0000	0.0000	1.04E-07
207	0.00	0.000	0.000	0.0130	0.8090	0.1375	1.04E-07	0.0000	0.0000	1.02E-07
208	0.25	0.000	0.046	0.0471	0.7889	0.1341	1.01E-07	0.0000	0.0000	9.92E-08
209	0.09	0.000	0.040	0.0554	0.7691	0.1307	9.85E-08	0.0000	0.0000	9.67E-08
210	0.01	0.000	0.046	0.0467	0.7490	0.1273	9.58E-08	0.0000	0.0000	9.41E-08
211	0.01	0.000	0.045	0.0394	0.7295	0.1240	9.33E-08	0.0000	0.0000	9.17E-08
212	0.00	0.000	0.039	0.0318	0.7053	0.1198	9.01E-08	0.0000	0.0000	8.86E-08
213	0.00	0.000	0.040	0.0243	0.6864	0.1166	8.77E-08	0.0000	0.0000	8.63E-08
214	0.41	0.000	0.049	0.0828	0.6718	0.1141	8.58E-08	0.0000	0.0000	8.44E-08
215	0.00	0.000	0.140	0.0312	0.6661	0.1132	8.50E-08	0.0000	0.0000	8.36E-08
216	0.00	0.000	0.066	0.0197	0.6471	0.1100	8.26E-08	0.0000	0.0000	8.12E-08
217	0.00	0.000	0.024	0.0157	0.6153	0.1046	7.85E-08	0.0000	0.0000	7.72E-08
218	0.00	0.000	0.016	0.0130	0.6167	0.1048	7.86E-08	0.0000	0.0000	7.74E-08
219	0.00	0.000	0.000	0.0130	0.6150	0.1045	7.84E-08	0.0000	0.0000	7.72E-08
220	0.33	0.000	0.052	0.0593	0.5797	0.0985	7.39E-08	0.0000	0.0000	7.27E-08
221	0.00	0.000	0.055	0.0405	0.5276	0.0896	6.71E-08	0.0000	0.0000	6.61E-08
222	0.26	0.000	0.150	0.0535	0.4737	0.0805	6.02E-08	0.0000	0.0000	5.93E-08
223	0.00	0.000	0.049	0.0443	0.4457	0.0757	5.66E-08	0.0000	0.0000	5.58E-08
224	0.00	0.000	0.141	0.0188	0.4146	0.0705	5.26E-08	0.0000	0.0000	5.19E-08
225	0.00	0.000	0.028	0.0130	0.3981	0.0676	5.05E-08	0.0000	0.0000	4.98E-08
226	0.11	0.000	0.059	0.0216	0.4401	0.0748	5.59E-08	0.0000	0.0000	5.51E-08
227	0.00	0.000	0.028	0.0170	0.4378	0.0744	5.56E-08	0.0000	0.0000	5.48E-08
228	0.29	0.000	0.057	0.0558	0.4347	0.0739	5.52E-08	0.0000	0.0000	5.44E-08
229	0.00	0.000	0.092	0.0406	0.4299	0.0730	5.46E-08	0.0000	0.0000	5.38E-08
230	0.21	0.000	0.047	0.0635	0.4158	0.0706	5.27E-08	0.0000	0.0000	5.21E-08

231	0.07	0.000	0.153	0.0435	0.3999	0.0679	5.07E-08	0.0000	0.0000	5.01E-08
232	0.00	0.000	0.110	0.0232	0.3839	0.0652	4.87E-08	0.0000	0.0000	4.81E-08
233	0.00	0.000	0.042	0.0132	0.3700	0.0629	4.69E-08	0.0000	0.0000	4.63E-08
234	0.00	0.000	0.001	0.0130	0.3641	0.0619	4.61E-08	0.0000	0.0000	4.56E-08
235	0.06	0.000	0.024	0.0190	0.3641	0.0619	4.61E-08	0.0000	0.0000	4.56E-08
236	0.00	0.000	0.020	0.0157	0.3782	0.0643	4.79E-08	0.0000	0.0000	4.73E-08
237	0.00	0.000	0.014	0.0134	0.3956	0.0672	5.02E-08	0.0000	0.0000	4.95E-08
238	0.00	0.000	0.002	0.0130	0.3979	0.0676	5.04E-08	0.0000	0.0000	4.98E-08
239	0.04	0.000	0.024	0.0157	0.3856	0.0655	4.89E-08	0.0000	0.0000	4.83E-08
240	0.00	0.000	0.012	0.0138	0.3677	0.0625	4.66E-08	0.0000	0.0000	4.60E-08
241	0.00	0.000	0.004	0.0132	0.3488	0.0593	4.42E-08	0.0000	0.0000	4.36E-08
242	0.06	0.000	0.021	0.0196	0.3342	0.0568	4.23E-08	0.0000	0.0000	4.18E-08
243	0.00	0.000	0.023	0.0158	0.3260	0.0554	4.13E-08	0.0000	0.0000	4.08E-08
244	0.04	0.000	0.038	0.0161	0.3223	0.0548	4.08E-08	0.0000	0.0000	4.03E-08
245	0.04	0.000	0.033	0.0173	0.3207	0.0545	4.06E-08	0.0000	0.0000	4.01E-08
246	0.01	0.000	0.023	0.0151	0.3211	0.0546	4.06E-08	0.0000	0.0000	4.02E-08
247	0.03	0.000	0.032	0.0148	0.3226	0.0548	4.08E-08	0.0000	0.0000	4.03E-08
248	0.01	0.000	0.016	0.0137	0.3236	0.0550	4.10E-08	0.0000	0.0000	4.05E-08
249	0.00	0.000	0.003	0.0132	0.3230	0.0549	4.09E-08	0.0000	0.0000	4.04E-08
250	0.00	0.000	0.001	0.0130	0.3226	0.0548	4.08E-08	0.0000	0.0000	4.03E-08
251	0.00	0.000	0.000	0.0130	0.3219	0.0547	4.07E-08	0.0000	0.0000	4.03E-08
252	0.06	0.000	0.015	0.0206	0.3203	0.0544	4.05E-08	0.0000	0.0000	4.01E-08
253	0.01	0.000	0.034	0.0165	0.3179	0.0540	4.02E-08	0.0000	0.0000	3.98E-08
254	0.02	0.000	0.029	0.0150	0.3156	0.0536	3.99E-08	0.0000	0.0000	3.95E-08
255	0.00	0.000	0.009	0.0135	0.3130	0.0532	3.96E-08	0.0000	0.0000	3.92E-08
256	0.28	0.000	0.040	0.0534	0.3101	0.0527	3.92E-08	0.0000	0.0000	3.88E-08
257	0.00	0.000	0.016	0.0443	0.3071	0.0522	3.88E-08	0.0000	0.0000	3.84E-08
258	0.19	0.000	0.071	0.0564	0.3038	0.0516	3.84E-08	0.0000	0.0000	3.80E-08
259	0.06	0.000	0.058	0.0549	0.2997	0.0509	3.79E-08	0.0000	0.0000	3.75E-08
260	0.00	0.000	0.059	0.0446	0.2980	0.0506	3.77E-08	0.0000	0.0000	3.73E-08
261	0.00	0.000	0.052	0.0347	0.2938	0.0499	3.72E-08	0.0000	0.0000	3.67E-08
262	0.00	0.000	0.062	0.0226	0.2852	0.0485	3.61E-08	0.0000	0.0000	3.57E-08
263	0.00	0.000	0.028	0.0160	0.2832	0.0481	3.58E-08	0.0000	0.0000	3.54E-08
264	0.02	0.000	0.030	0.0144	0.2846	0.0484	3.60E-08	0.0000	0.0000	3.56E-08

265		0.20	0.000	0.026	0.0434	0.2883	0.0490	3.65E-08	0.0000	0.0000	3.61E-08
266		0.00	0.000	0.026	0.0391	0.2789	0.0474	3.53E-08	0.0000	0.0000	3.49E-08
267		0.14	0.000	0.072	0.0503	0.2739	0.0465	3.46E-08	0.0000	0.0000	3.42E-08
268		0.16	0.000	0.063	0.0665	0.2735	0.0465	3.46E-08	0.0000	0.0000	3.42E-08
269	*	0.00	0.000	0.020	0.0529	0.2729	0.0464	3.45E-08	0.0000	0.0000	3.41E-08
270		0.00	0.000	0.073	0.0383	0.2647	0.0450	3.34E-08	0.0000	0.0000	3.31E-08
271		0.00	0.000	0.063	0.0268	0.2624	0.0446	3.31E-08	0.0000	0.0000	3.28E-08
272		0.00	0.000	0.054	0.0150	0.2591	0.0440	3.27E-08	0.0000	0.0000	3.24E-08
273		0.00	0.000	0.012	0.0130	0.2342	0.0398	2.96E-08	0.0000	0.0000	2.93E-08
274		0.00	0.000	0.000	0.0130	0.2301	0.0391	2.90E-08	0.0000	0.0000	2.88E-08
275		0.00	0.000	0.000	0.0130	0.2163	0.0367	2.73E-08	0.0000	0.0000	2.70E-08
276		0.05	0.000	0.019	0.0181	0.2111	0.0359	2.66E-08	0.0000	0.0000	2.64E-08
277		0.00	0.000	0.021	0.0146	0.2169	0.0369	2.74E-08	0.0000	0.0000	2.71E-08
278	*	0.00	0.000	0.007	0.0134	0.2250	0.0382	2.84E-08	0.0000	0.0000	2.81E-08
279		0.00	0.000	0.002	0.0130	0.2291	0.0389	2.89E-08	0.0000	0.0000	2.86E-08
280	*	0.19	0.000	0.035	0.0163	0.2274	0.0386	2.87E-08	0.0000	0.0000	2.84E-08
281		0.65	0.000	0.000	0.1303	0.2216	0.0376	2.80E-08	0.0000	0.0000	2.77E-08
282		0.04	0.000	0.000	0.0809	0.2143	0.0364	2.70E-08	0.0000	0.0000	2.68E-08
283		0.00	0.000	0.032	0.0437	0.1953	0.0332	2.46E-08	0.0000	0.0000	2.44E-08
284	*	0.00	0.000	0.015	0.0411	0.2050	0.0348	2.59E-08	0.0000	0.0000	2.56E-08
285	*	0.00	0.000	0.013	0.0390	0.2001	0.0340	2.52E-08	0.0000	0.0000	2.50E-08
286		0.00	0.000	0.028	0.0344	0.1706	0.0290	2.15E-08	0.0000	0.0000	2.13E-08
287		0.15	0.000	0.031	0.0541	0.1522	0.0259	1.92E-08	0.0000	0.0000	1.90E-08
288		0.30	0.000	0.064	0.0832	0.1574	0.0268	1.98E-08	0.0000	0.0000	1.97E-08
289		0.10	0.000	0.040	0.0618	0.1822	0.0310	2.30E-08	0.0000	0.0000	2.28E-08
290		0.10	0.000	0.033	0.0608	0.1959	0.0333	2.47E-08	0.0000	0.0000	2.45E-08
291		0.00	0.000	0.017	0.0549	0.2336	0.0397	2.95E-08	0.0000	0.0000	2.92E-08
292		0.00	0.000	0.024	0.0479	0.2502	0.0425	3.16E-08	0.0000	0.0000	3.13E-08
293		0.00	0.000	0.035	0.0403	0.2320	0.0394	2.93E-08	0.0000	0.0000	2.90E-08
294		0.00	0.000	0.045	0.0320	0.2010	0.0342	2.54E-08	0.0000	0.0000	2.51E-08
295		0.00	0.000	0.013	0.0284	0.1665	0.0283	2.10E-08	0.0000	0.0000	2.08E-08
296		0.00	0.000	0.032	0.0210	0.1356	0.0230	1.71E-08	0.0000	0.0000	1.69E-08
297		0.31	0.000	0.031	0.0660	0.1187	0.0202	1.49E-08	0.0000	0.0000	1.48E-08
298		0.01	0.000	0.024	0.0412	0.1212	0.0206	1.52E-08	0.0000	0.0000	1.51E-08

299			0.00	0.000	0.019	0.0362	0.1375	0.0234	1.73E-08	0.0000	0.0000	1.72E-08
300			0.02	0.000	0.027	0.0336	0.1459	0.0248	1.84E-08	0.0000	0.0000	1.82E-08
301			0.13	0.000	0.029	0.0498	0.1666	0.0283	2.10E-08	0.0000	0.0000	2.08E-08
302			0.01	0.000	0.015	0.0481	0.1591	0.0270	2.00E-08	0.0000	0.0000	1.99E-08
303			0.00	0.000	0.020	0.0440	0.1300	0.0221	1.64E-08	0.0000	0.0000	1.62E-08
304			0.00	0.000	0.022	0.0397	0.0997	0.0169	1.25E-08	0.0000	0.0000	1.25E-08
305			0.01	0.000	0.020	0.0377	0.0848	0.0144	1.07E-08	0.0000	0.0000	1.06E-08
306			0.06	0.000	0.030	0.0424	0.0854	0.0145	1.07E-08	0.0000	0.0000	1.07E-08
307			0.35	0.000	0.032	0.0952	0.0939	0.0160	1.18E-08	0.0000	0.0000	1.17E-08
308			0.00	0.000	0.018	0.0400	0.1059	0.0180	1.33E-08	0.0000	0.0000	1.32E-08
309	*		0.00	0.000	0.010	0.0354	0.0926	0.0157	1.16E-08	0.0000	0.0000	1.16E-08
310			0.00	0.000	0.015	0.0317	0.1063	0.0181	1.34E-08	0.0000	0.0000	1.33E-08
311			0.16	0.000	0.022	0.0542	0.1106	0.0188	1.39E-08	0.0000	0.0000	1.38E-08
312			0.40	0.000	0.018	0.1042	0.0766	0.0130	9.63E-09	0.0000	0.0000	9.57E-09
313	*		0.00	0.000	0.009	0.0482	0.0467	0.0079	7.37E-09	0.0000	0.0000	7.33E-09
314	*		0.00	0.000	0.008	0.0408	0.0353	0.0060	7.23E-09	0.0000	0.0000	7.19E-09
315			0.03	0.000	0.012	0.0424	0.0866	0.0147	1.09E-08	0.0000	0.0000	1.08E-08
316	*		0.00	0.000	0.009	0.0400	0.1343	0.0228	1.69E-08	0.0000	0.0000	1.68E-08
317	*		0.07	0.000	0.010	0.0426	0.1420	0.0241	1.79E-08	0.0000	0.0000	1.78E-08
318			0.14	0.000	0.000	0.0721	0.1240	0.0211	1.56E-08	0.0000	0.0000	1.55E-08
319	*		0.74	0.000	0.009	0.0549	0.1217	0.0207	1.53E-08	0.0000	0.0000	1.52E-08
320	*		0.10	0.000	0.007	0.0550	0.1247	0.0212	1.57E-08	0.0000	0.0000	1.56E-08
321	*		0.16	0.000	0.009	0.0562	0.1601	0.0272	2.02E-08	0.0000	0.0000	2.00E-08
322	*		0.17	0.000	0.007	0.0583	0.1905	0.0324	2.40E-08	0.0000	0.0000	2.38E-08
323	*		0.09	0.000	0.006	0.0598	0.1824	0.0310	2.30E-08	0.0000	0.0000	2.28E-08
324	*		0.13	0.000	0.007	0.0598	0.1605	0.0273	2.02E-08	0.0000	0.0000	2.00E-08
325	*		0.72	0.000	0.007	0.0598	0.1276	0.0217	1.61E-08	0.0000	0.0000	1.59E-08
326	*		0.53	0.000	0.005	0.0598	0.1261	0.0214	1.59E-08	0.0000	0.0000	1.58E-08
327	*		0.05	0.000	0.006	0.0598	0.1379	0.0234	1.74E-08	0.0000	0.0000	1.72E-08
328	*		0.00	0.000	0.006	0.0598	0.1398	0.0238	1.76E-08	0.0000	0.0000	1.75E-08
329	*	*	0.00	0.000	0.007	0.0598	0.1214	0.0206	1.53E-08	0.0000	0.0000	1.52E-08
330	*	*	0.00	0.000	0.008	0.0598	0.1046	0.0178	1.31E-08	0.0000	0.0000	1.31E-08
331	*	*	0.00	0.000	0.000	0.0598	0.0695	0.0118	8.80E-09	0.0000	0.0000	8.76E-09
332	*	*	0.00	0.000	0.000	0.0598	0.0508	0.0086	7.42E-09	0.0000	0.0000	7.38E-09

333	*	*	0.03	0.000	0.000	0.0598	0.0678	0.0115	8.60E-09	0.0000	0.0000	8.56E-09
334	*	*	0.01	0.000	0.000	0.0598	0.1037	0.0176	1.30E-08	0.0000	0.0000	1.30E-08
335	*	*	0.05	0.000	0.000	0.0598	0.1374	0.0233	1.73E-08	0.0000	0.0000	1.72E-08
336	*	*	0.02	0.000	0.006	0.0598	0.1592	0.0271	2.01E-08	0.0000	0.0000	1.99E-08
337	*	*	0.00	0.000	0.003	0.0598	0.1696	0.0288	2.14E-08	0.0000	0.0000	2.12E-08
338	*	*	0.00	0.000	0.006	0.0598	0.1733	0.0295	2.18E-08	0.0000	0.0000	2.17E-08
339	*	*	0.00	0.000	0.000	0.0598	0.1757	0.0299	2.21E-08	0.0000	0.0000	2.20E-08
340	*	*	0.16	0.000	0.004	0.0598	0.1803	0.0306	2.27E-08	0.0000	0.0000	2.25E-08
341	*	*	0.07	0.000	0.004	0.0598	0.1882	0.0320	2.37E-08	0.0000	0.0000	2.35E-08
342	*	*	0.12	0.000	0.004	0.0598	0.1989	0.0338	2.51E-08	0.0000	0.0000	2.49E-08
343	*	*	0.13	0.000	0.000	0.0598	0.2107	0.0358	2.66E-08	0.0000	0.0000	2.63E-08
344	*	*	0.06	0.000	0.004	0.0598	0.2222	0.0378	2.80E-08	0.0000	0.0000	2.78E-08
345	*	*	0.16	0.000	0.004	0.0598	0.2322	0.0395	2.93E-08	0.0000	0.0000	2.90E-08
346	*	*	0.01	0.000	0.003	0.0598	0.2404	0.0408	3.04E-08	0.0000	0.0000	3.00E-08
347	*	*	0.06	0.000	0.003	0.0598	0.2466	0.0419	3.11E-08	0.0000	0.0000	3.08E-08
348	*	*	0.00	0.000	0.002	0.0598	0.2510	0.0427	3.17E-08	0.0000	0.0000	3.14E-08
349	*	*	0.07	0.000	0.000	0.0598	0.2539	0.0432	3.21E-08	0.0000	0.0000	3.17E-08
350	*	*	0.00	0.000	0.000	0.0598	0.2556	0.0434	3.23E-08	0.0000	0.0000	3.20E-08
351	*	*	0.20	0.000	0.000	0.0598	0.2563	0.0436	3.24E-08	0.0000	0.0000	3.20E-08
352	*	*	0.31	0.000	0.005	0.0598	0.2563	0.0435	3.24E-08	0.0000	0.0000	3.20E-08
353	*	*	0.06	0.000	0.004	0.0598	0.2557	0.0434	3.23E-08	0.0000	0.0000	3.20E-08
354	*	*	0.31	0.000	0.000	0.0598	0.2546	0.0433	3.22E-08	0.0000	0.0000	3.18E-08
355	*	*	0.07	0.000	0.005	0.0598	0.2532	0.0430	3.20E-08	0.0000	0.0000	3.17E-08
356	*	*	0.04	0.000	0.005	0.0598	0.2516	0.0428	3.18E-08	0.0000	0.0000	3.15E-08
357	*	*	0.45	0.000	0.005	0.0598	0.2498	0.0424	3.15E-08	0.0000	0.0000	3.12E-08
358	*	*	0.02	0.000	0.004	0.0598	0.2478	0.0421	3.13E-08	0.0000	0.0000	3.10E-08
359	*	*	0.22	0.000	0.000	0.0598	0.2458	0.0418	3.10E-08	0.0000	0.0000	3.08E-08
360	*	*	0.08	0.000	0.001	0.0598	0.2437	0.0414	3.08E-08	0.0000	0.0000	3.05E-08
361	*	*	0.01	0.000	0.000	0.0598	0.2415	0.0410	3.05E-08	0.0000	0.0000	3.02E-08
362	*	*	0.06	0.000	0.003	0.0598	0.2392	0.0407	3.02E-08	0.0000	0.0000	2.99E-08
363	*	*	0.01	0.000	0.002	0.0598	0.2370	0.0403	2.99E-08	0.0000	0.0000	2.96E-08
364	*	*	0.02	0.000	0.000	0.0598	0.2347	0.0399	2.96E-08	0.0000	0.0000	2.93E-08
365	*	*	0.05	0.000	0.000	0.0598	0.2324	0.0395	2.93E-08	0.0000	0.0000	2.91E-08

* = Frozen (air or soil)

Annual Totals for Year 1			
	inches	cubic feet	percent
Precipitation	31.40	854,865.0	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	9.445	257,145.4	30.08
Drainage Collected from Layer 3	21.7247	591,455.1	69.19
Percolation/Leakage through Layer 5	0.000016	0.4429	0.00
Average Head on Top of Layer 4	0.3503	---	---
Drainage Collected from Layer 6	0.0000	0.0062	0.00
Percolation/Leakage through Layer 7	0.000016	0.4366	0.00
Average Head on Top of Layer 7	0.0000	---	---
Change in Water Storage	0.2301	6,264.1	0.73
Soil Water at Start of Year	26.8220	730,229.5	85.42
Soil Water at End of Year	27.0521	736,493.6	86.15
Snow Water at Start of Year	5.1939	141,404.4	16.54
Snow Water at End of Year	5.1939	141,404.4	16.54
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 2

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 7
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 6
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 7

Title: WPC-Ore Pad Liner
Simulated On: 4/1/2026 23:24

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1	*	*	0.07	0.000	0.000	0.0598	0.2302	0.0391	2.91E-08	0.0000	0.0000	2.88E-08
2	*	*	0.00	0.000	0.004	0.0598	0.2279	0.0387	2.88E-08	0.0000	0.0000	2.85E-08
3	*	*	0.03	0.000	0.000	0.0598	0.2256	0.0383	2.85E-08	0.0000	0.0000	2.82E-08
4	*	*	0.03	0.000	0.000	0.0598	0.2234	0.0380	2.82E-08	0.0000	0.0000	2.79E-08
5	*	*	0.01	0.000	0.000	0.0598	0.2212	0.0376	2.79E-08	0.0000	0.0000	2.76E-08
6	*	*	0.02	0.000	0.000	0.0598	0.2190	0.0372	2.76E-08	0.0000	0.0000	2.74E-08
7	*	*	0.06	0.000	0.000	0.0598	0.2168	0.0368	2.73E-08	0.0000	0.0000	2.71E-08
8	*	*	0.16	0.000	0.004	0.0598	0.2146	0.0365	2.71E-08	0.0000	0.0000	2.68E-08
9	*	*	0.01	0.000	0.005	0.0598	0.2125	0.0361	2.68E-08	0.0000	0.0000	2.66E-08
10	*	*	0.00	0.000	0.000	0.0598	0.2104	0.0357	2.65E-08	0.0000	0.0000	2.63E-08
11	*	*	0.00	0.000	0.005	0.0598	0.2083	0.0354	2.63E-08	0.0000	0.0000	2.60E-08
12		*	0.00	0.000	0.000	0.0598	0.2062	0.0350	2.60E-08	0.0000	0.0000	2.58E-08
13	*	*	0.00	0.000	0.000	0.0598	0.2042	0.0347	2.57E-08	0.0000	0.0000	2.55E-08
14	*	*	0.00	0.000	0.000	0.0598	0.2022	0.0344	2.55E-08	0.0000	0.0000	2.53E-08
15	*	*	0.59	0.000	0.000	0.0598	0.2002	0.0340	2.52E-08	0.0000	0.0000	2.50E-08
16	*	*	0.20	0.000	0.006	0.0598	0.1982	0.0337	2.50E-08	0.0000	0.0000	2.48E-08
17	*	*	0.04	0.000	0.003	0.0598	0.1963	0.0334	2.48E-08	0.0000	0.0000	2.45E-08
18	*	*	0.02	0.000	0.006	0.0598	0.1944	0.0330	2.45E-08	0.0000	0.0000	2.43E-08
19	*	*	0.21	0.000	0.004	0.0598	0.1925	0.0327	2.43E-08	0.0000	0.0000	2.41E-08
20	*	*	0.01	0.000	0.003	0.0598	0.1907	0.0324	2.40E-08	0.0000	0.0000	2.38E-08
21	*	*	0.00	0.000	0.000	0.0598	0.1889	0.0321	2.38E-08	0.0000	0.0000	2.36E-08
22	*	*	0.01	0.000	0.000	0.0598	0.1871	0.0318	2.36E-08	0.0000	0.0000	2.34E-08
23	*	*	0.01	0.000	0.000	0.0598	0.1853	0.0315	2.34E-08	0.0000	0.0000	2.32E-08
24	*	*	0.21	0.000	0.000	0.0598	0.1836	0.0312	2.31E-08	0.0000	0.0000	2.29E-08
25	*	*	0.00	0.000	0.004	0.0598	0.1819	0.0309	2.29E-08	0.0000	0.0000	2.27E-08
26	*	*	0.00	0.000	0.006	0.0598	0.1802	0.0306	2.27E-08	0.0000	0.0000	2.25E-08

27	*	*	0.36	0.000	0.003	0.0598	0.1785	0.0303	2.25E-08	0.0000	0.0000	2.23E-08
28	*	*	0.00	0.000	0.000	0.0598	0.1769	0.0301	2.23E-08	0.0000	0.0000	2.21E-08
29	*	*	0.00	0.000	0.005	0.0598	0.1753	0.0298	2.21E-08	0.0000	0.0000	2.19E-08
30		*	0.51	0.000	0.000	0.0598	0.1737	0.0295	2.19E-08	0.0000	0.0000	2.17E-08
31	*	*	0.10	0.000	0.000	0.0598	0.1721	0.0292	2.17E-08	0.0000	0.0000	2.15E-08
32	*	*	0.05	0.000	0.004	0.0598	0.1706	0.0290	2.15E-08	0.0000	0.0000	2.13E-08
33	*	*	0.18	0.000	0.004	0.0598	0.1691	0.0287	2.13E-08	0.0000	0.0000	2.11E-08
34	*	*	0.01	0.000	0.003	0.0598	0.1676	0.0285	2.11E-08	0.0000	0.0000	2.09E-08
35	*	*	0.03	0.000	0.000	0.0598	0.1661	0.0282	2.09E-08	0.0000	0.0000	2.08E-08
36	*	*	0.01	0.000	0.000	0.0598	0.1646	0.0280	2.07E-08	0.0000	0.0000	2.06E-08
37	*	*	0.00	0.000	0.000	0.0598	0.1632	0.0277	2.06E-08	0.0000	0.0000	2.04E-08
38	*	*	0.00	0.000	0.003	0.0598	0.1618	0.0275	2.04E-08	0.0000	0.0000	2.02E-08
39	*	*	0.13	0.000	0.000	0.0598	0.1604	0.0273	2.02E-08	0.0000	0.0000	2.00E-08
40	*	*	0.43	0.000	0.000	0.0598	0.1591	0.0270	2.00E-08	0.0000	0.0000	1.99E-08
41	*	*	0.44	0.000	0.002	0.0598	0.1577	0.0268	1.99E-08	0.0000	0.0000	1.97E-08
42	*	*	0.00	0.000	0.001	0.0598	0.1564	0.0266	1.97E-08	0.0000	0.0000	1.95E-08
43	*	*	0.08	0.000	0.000	0.0598	0.1551	0.0263	1.95E-08	0.0000	0.0000	1.94E-08
44	*	*	0.04	0.000	0.000	0.0598	0.1538	0.0261	1.94E-08	0.0000	0.0000	1.92E-08
45	*	*	0.01	0.000	0.000	0.0598	0.1525	0.0259	1.92E-08	0.0000	0.0000	1.91E-08
46	*	*	0.03	0.000	0.002	0.0598	0.1513	0.0257	1.90E-08	0.0000	0.0000	1.89E-08
47	*	*	0.00	0.000	0.004	0.0598	0.1500	0.0255	1.89E-08	0.0000	0.0000	1.87E-08
48	*	*	0.04	0.000	0.002	0.0598	0.1488	0.0253	1.87E-08	0.0000	0.0000	1.86E-08
49	*	*	0.00	0.000	0.003	0.0598	0.1476	0.0251	1.86E-08	0.0000	0.0000	1.84E-08
50	*	*	0.04	0.000	0.000	0.0598	0.1464	0.0249	1.84E-08	0.0000	0.0000	1.83E-08
51	*	*	0.02	0.000	0.004	0.0598	0.1453	0.0247	1.83E-08	0.0000	0.0000	1.81E-08
52	*	*	0.00	0.000	0.002	0.0598	0.1441	0.0245	1.81E-08	0.0000	0.0000	1.80E-08
53	*	*	0.02	0.000	0.000	0.0598	0.1430	0.0243	1.80E-08	0.0000	0.0000	1.79E-08
54	*	*	0.02	0.000	0.000	0.0598	0.1418	0.0241	1.79E-08	0.0000	0.0000	1.77E-08
55	*	*	0.10	0.000	0.000	0.0598	0.1407	0.0239	1.77E-08	0.0000	0.0000	1.76E-08
56	*	*	0.44	0.000	0.000	0.0598	0.1397	0.0237	1.76E-08	0.0000	0.0000	1.74E-08
57	*	*	0.17	0.000	0.000	0.0598	0.1386	0.0235	1.74E-08	0.0000	0.0000	1.73E-08
58	*	*	0.04	0.000	0.003	0.0598	0.1375	0.0234	1.73E-08	0.0000	0.0000	1.72E-08
59	*	*	0.00	0.000	0.003	0.0598	0.1365	0.0232	1.72E-08	0.0000	0.0000	1.70E-08
60	*	*	0.00	0.000	0.000	0.0598	0.1354	0.0230	1.70E-08	0.0000	0.0000	1.69E-08

61	*	*	0.00	0.000	0.000	0.0598	0.1344	0.0228	1.69E-08	0.0000	0.0000	1.68E-08
62	*	*	0.00	0.000	0.000	0.0598	0.1334	0.0227	1.68E-08	0.0000	0.0000	1.67E-08
63	*	*	0.04	0.000	0.004	0.0598	0.1324	0.0225	1.67E-08	0.0000	0.0000	1.65E-08
64	*	*	0.13	0.000	0.005	0.0598	0.1315	0.0223	1.65E-08	0.0000	0.0000	1.64E-08
65	*	*	0.02	0.000	0.000	0.0598	0.1305	0.0222	1.64E-08	0.0000	0.0000	1.63E-08
66	*	*	0.00	0.000	0.006	0.0598	0.1295	0.0220	1.63E-08	0.0000	0.0000	1.62E-08
67	*	*	0.26	0.000	0.000	0.0598	0.1286	0.0219	1.62E-08	0.0000	0.0000	1.61E-08
68	*	*	0.12	0.000	0.003	0.0598	0.1277	0.0217	1.61E-08	0.0000	0.0000	1.59E-08
69	*	*	0.00	0.000	0.006	0.0598	0.1268	0.0215	1.60E-08	0.0000	0.0000	1.58E-08
70	*	*	0.06	0.000	0.005	0.0598	0.1259	0.0214	1.58E-08	0.0000	0.0000	1.57E-08
71	*	*	0.06	0.000	0.000	0.0598	0.1250	0.0212	1.57E-08	0.0000	0.0000	1.56E-08
72	*	*	0.30	0.000	0.000	0.0598	0.1241	0.0211	1.56E-08	0.0000	0.0000	1.55E-08
73	*	*	0.07	0.000	0.000	0.0598	0.1232	0.0209	1.55E-08	0.0000	0.0000	1.54E-08
74	*	*	0.00	0.000	0.006	0.0598	0.1224	0.0208	1.54E-08	0.0000	0.0000	1.53E-08
75	*	*	0.00	0.000	0.007	0.0598	0.1215	0.0206	1.53E-08	0.0000	0.0000	1.52E-08
76	*	*	0.00	0.000	0.004	0.0598	0.1207	0.0205	1.52E-08	0.0000	0.0000	1.51E-08
77	*	*	0.00	0.000	0.005	0.0598	0.1198	0.0204	1.51E-08	0.0000	0.0000	1.50E-08
78	*	*	0.00	0.000	0.000	0.0598	0.1190	0.0202	1.50E-08	0.0000	0.0000	1.49E-08
79	*	*	0.00	0.000	0.000	0.0598	0.1182	0.0201	1.49E-08	0.0000	0.0000	1.48E-08
80	*	*	0.08	0.000	0.000	0.0598	0.1174	0.0200	1.48E-08	0.0000	0.0000	1.47E-08
81	*	*	0.00	0.000	0.011	0.0598	0.1166	0.0198	1.47E-08	0.0000	0.0000	1.46E-08
82	*	*	0.00	0.000	0.007	0.0598	0.1159	0.0197	1.46E-08	0.0000	0.0000	1.45E-08
83	*	*	0.01	0.000	0.004	0.0598	0.1151	0.0196	1.45E-08	0.0000	0.0000	1.44E-08
84	*	*	0.09	0.000	0.005	0.0598	0.1143	0.0194	1.44E-08	0.0000	0.0000	1.43E-08
85	*	*	0.29	0.000	0.010	0.0598	0.1136	0.0193	1.43E-08	0.0000	0.0000	1.42E-08
86	*	*	0.01	0.000	0.000	0.0598	0.1128	0.0192	1.42E-08	0.0000	0.0000	1.41E-08
87	*	*	0.00	0.000	0.000	0.0598	0.1121	0.0190	1.41E-08	0.0000	0.0000	1.40E-08
88		*	0.00	0.000	0.000	0.0598	0.1114	0.0189	1.40E-08	0.0000	0.0000	1.39E-08
89		*	0.00	0.000	0.011	0.0620	0.1107	0.0188	1.39E-08	0.0000	0.0000	1.38E-08
90		*	0.00	0.000	0.000	0.0825	0.1100	0.0187	1.38E-08	0.0000	0.0000	1.37E-08
91	*	*	0.01	0.000	0.010	0.0901	0.1093	0.0186	1.37E-08	0.0000	0.0000	1.36E-08
92	*	*	0.00	0.000	0.016	0.0901	0.1086	0.0184	1.37E-08	0.0000	0.0000	1.36E-08
93	*	*	0.14	0.000	0.009	0.0901	0.1079	0.0183	1.36E-08	0.0000	0.0000	1.35E-08
94	*	*	0.00	0.000	0.010	0.0901	0.1072	0.0182	1.35E-08	0.0000	0.0000	1.34E-08

95		*	0.00	0.000	0.000	0.1277	0.1065	0.0181	1.34E-08	0.0000	0.0000	1.33E-08
96		*	0.25	0.000	0.000	0.2069	0.1059	0.0180	1.33E-08	0.0000	0.0000	1.32E-08
97		*	0.27	0.000	0.000	0.3970	0.1052	0.0179	1.32E-08	0.0000	0.0000	1.31E-08
98		*	0.16	0.000	0.000	0.3970	0.1048	0.0178	1.32E-08	0.0000	0.0000	1.31E-08
99		*	0.00	0.000	0.002	0.3970	0.0969	0.0165	1.22E-08	0.0000	0.0000	1.21E-08
100		*	0.00	0.000	0.000	0.3970	0.1096	0.0186	1.38E-08	0.0000	0.0000	1.37E-08
101		*	0.07	0.000	0.000	0.3970	0.1154	0.0196	1.45E-08	0.0000	0.0000	1.44E-08
102		*	0.38	0.000	0.000	0.3970	0.1085	0.0184	1.36E-08	0.0000	0.0000	1.35E-08
103	*	*	0.02	0.000	0.010	0.3970	0.0970	0.0165	1.22E-08	0.0000	0.0000	1.21E-08
104		*	0.01	0.000	0.000	0.3970	0.0893	0.0152	1.12E-08	0.0000	0.0000	1.11E-08
105		*	0.30	0.000	0.000	0.3970	0.0818	0.0139	1.03E-08	0.0000	0.0000	1.02E-08
106	*	*	0.62	0.000	0.000	0.3970	0.0868	0.0148	1.09E-08	0.0000	0.0000	1.08E-08
107	*	*	0.07	0.000	0.011	0.3970	0.0955	0.0162	1.20E-08	0.0000	0.0000	1.19E-08
108	*	*	0.00	0.000	0.025	0.3970	0.1072	0.0182	1.35E-08	0.0000	0.0000	1.34E-08
109		*	0.00	0.000	0.000	0.3970	0.1057	0.0180	1.33E-08	0.0000	0.0000	1.32E-08
110		*	0.01	0.000	0.000	0.3970	0.0947	0.0161	1.19E-08	0.0000	0.0000	1.18E-08
111		*	0.24	0.000	0.000	0.3970	0.0970	0.0165	1.22E-08	0.0000	0.0000	1.21E-08
112		*	0.55	0.000	0.000	0.3970	0.1214	0.0206	1.53E-08	0.0000	0.0000	1.52E-08
113		*	1.38	0.000	0.000	0.3970	0.1274	0.0216	1.60E-08	0.0000	0.0000	1.59E-08
114	*	*	0.56	0.000	0.011	0.3970	0.1410	0.0240	1.77E-08	0.0000	0.0000	1.76E-08
115		*	0.01	0.000	0.000	0.3970	0.1335	0.0227	1.68E-08	0.0000	0.0000	1.67E-08
116		*	0.00	0.000	0.000	0.3970	0.1211	0.0206	1.52E-08	0.0000	0.0000	1.51E-08
117		*	0.00	0.000	0.000	0.3970	0.1024	0.0174	1.29E-08	0.0000	0.0000	1.28E-08
118		*	0.00	0.000	0.000	0.3970	0.0932	0.0158	1.17E-08	0.0000	0.0000	1.16E-08
119		*	0.07	0.000	0.001	0.3970	0.6917	0.1175	8.90E-08	0.0000	0.0000	8.75E-08
120		*	0.00	0.000	0.000	0.3970	1.9222	0.3266	2.53E-07	0.0000	0.0000	2.46E-07
121		*	0.37	0.000	0.001	0.3970	2.4176	0.4108	3.21E-07	0.0000	0.0000	3.11E-07
122			0.00	0.000	0.047	0.0130	2.6507	0.4504	3.54E-07	0.0000	0.0000	3.42E-07
123			0.00	0.000	0.000	0.0130	2.6794	0.4553	3.58E-07	0.0000	0.0000	3.46E-07
124			0.00	0.000	0.000	0.0130	3.1632	0.5375	4.27E-07	0.0000	0.0000	4.11E-07
125			0.00	0.000	0.000	0.0130	3.4586	0.5877	4.69E-07	0.0000	0.0000	4.51E-07
126			0.01	0.000	0.010	0.0130	3.4476	0.5858	4.68E-07	0.0000	0.0000	4.50E-07
127			0.07	0.000	0.008	0.0233	3.2952	0.5599	4.46E-07	0.0000	0.0000	4.29E-07
128			0.00	0.000	0.025	0.0191	3.0811	0.5235	4.15E-07	0.0000	0.0000	4.00E-07

129	0.00	0.000	0.026	0.0148	2.8493	0.4842	3.82E-07	0.0000	0.0000	3.69E-07
130	0.66	0.000	0.027	0.1202	2.6225	0.4456	3.50E-07	0.0000	0.0000	3.38E-07
131	0.00	0.000	0.060	0.0571	2.4116	0.4098	3.20E-07	0.0000	0.0000	3.10E-07
132	0.00	0.000	0.046	0.0252	2.2216	0.3775	2.94E-07	0.0000	0.0000	2.85E-07
133	0.27	0.000	0.043	0.0618	2.0744	0.3525	2.74E-07	0.0000	0.0000	2.66E-07
134	0.00	0.000	0.063	0.0415	1.8671	0.3173	2.45E-07	0.0000	0.0000	2.38E-07
135	0.00	0.000	0.146	0.0138	1.4816	0.2518	1.93E-07	0.0000	0.0000	1.88E-07
136	0.08	0.000	0.030	0.0222	1.3404	0.2278	1.74E-07	0.0000	0.0000	1.70E-07
137	0.00	0.000	0.036	0.0161	1.3371	0.2272	1.73E-07	0.0000	0.0000	1.69E-07
138	0.00	0.000	0.014	0.0138	1.2801	0.2175	1.66E-07	0.0000	0.0000	1.62E-07
139	0.00	0.000	0.003	0.0132	1.2490	0.2122	1.62E-07	0.0000	0.0000	1.58E-07
140	0.00	0.000	0.001	0.0130	1.2341	0.2097	1.60E-07	0.0000	0.0000	1.56E-07
141	0.02	0.000	0.006	0.0154	1.2167	0.2067	1.57E-07	0.0000	0.0000	1.54E-07
142	0.44	0.000	0.029	0.0839	1.1933	0.2028	1.54E-07	0.0000	0.0000	1.51E-07
143	0.06	0.000	0.103	0.0419	1.1634	0.1977	1.50E-07	0.0000	0.0000	1.47E-07
144	0.25	0.000	0.062	0.0728	1.1294	0.1919	1.46E-07	0.0000	0.0000	1.43E-07
145	0.16	0.000	0.144	0.0613	1.0945	0.1860	1.41E-07	0.0000	0.0000	1.38E-07
146	0.50	0.000	0.155	0.1048	1.0741	0.1825	1.39E-07	0.0000	0.0000	1.36E-07
147	0.42	0.000	0.147	0.0995	0.9702	0.1649	1.25E-07	0.0000	0.0000	1.22E-07
148	0.00	0.000	0.093	0.0410	0.9015	0.1532	1.16E-07	0.0000	0.0000	1.14E-07
149	0.00	0.000	0.147	0.0144	0.8654	0.1471	1.11E-07	0.0000	0.0000	1.09E-07
150	0.00	0.000	0.008	0.0130	0.8653	0.1470	1.11E-07	0.0000	0.0000	1.09E-07
151	0.00	0.000	0.000	0.0130	0.8210	0.1395	1.05E-07	0.0000	0.0000	1.03E-07
152	0.09	0.000	0.037	0.0218	0.7681	0.1305	9.83E-08	0.0000	0.0000	9.66E-08
153	0.17	0.000	0.056	0.0409	0.6502	0.1105	8.30E-08	0.0000	0.0000	8.16E-08
154	0.26	0.000	0.078	0.0712	0.4279	0.0727	5.43E-08	0.0000	0.0000	5.36E-08
155	0.00	0.000	0.099	0.0438	0.3442	0.0585	4.36E-08	0.0000	0.0000	4.31E-08
156	0.00	0.000	0.047	0.0342	0.4827	0.0820	6.13E-08	0.0000	0.0000	6.05E-08
157	0.00	0.000	0.112	0.0130	0.6156	0.1046	7.85E-08	0.0000	0.0000	7.73E-08
158	0.00	0.000	0.000	0.0130	0.7165	0.1218	9.16E-08	0.0000	0.0000	9.00E-08
159	0.00	0.000	0.000	0.0130	0.7665	0.1302	9.81E-08	0.0000	0.0000	9.64E-08
160	0.01	0.000	0.005	0.0139	0.7864	0.1336	1.01E-07	0.0000	0.0000	9.89E-08
161	0.34	0.000	0.016	0.0679	0.7672	0.1304	9.82E-08	0.0000	0.0000	9.65E-08
162	0.21	0.000	0.030	0.0711	0.7417	0.1260	9.49E-08	0.0000	0.0000	9.32E-08

163	0.27	0.000	0.217	0.0689	0.7235	0.1229	9.25E-08	0.0000	0.0000	9.09E-08
164	0.05	0.000	0.205	0.0383	0.7020	0.1193	8.97E-08	0.0000	0.0000	8.82E-08
165	0.30	0.000	0.074	0.0743	0.6991	0.1188	8.93E-08	0.0000	0.0000	8.78E-08
166	0.01	0.000	0.099	0.0396	0.7081	0.1203	9.05E-08	0.0000	0.0000	8.90E-08
167	0.00	0.000	0.143	0.0134	0.7114	0.1209	9.09E-08	0.0000	0.0000	8.94E-08
168	0.18	0.000	0.060	0.0335	0.6317	0.1073	8.06E-08	0.0000	0.0000	7.94E-08
169	0.06	0.000	0.039	0.0370	0.5454	0.0927	6.94E-08	0.0000	0.0000	6.85E-08
170	0.25	0.000	0.040	0.0720	0.5591	0.0950	7.12E-08	0.0000	0.0000	7.02E-08
171	0.00	0.000	0.067	0.0437	0.5380	0.0914	6.85E-08	0.0000	0.0000	6.75E-08
172	0.15	0.000	0.064	0.0544	0.4759	0.0809	6.05E-08	0.0000	0.0000	5.96E-08
173	0.01	0.000	0.146	0.0297	0.4114	0.0699	5.22E-08	0.0000	0.0000	5.15E-08
174	0.00	0.000	0.082	0.0142	0.3744	0.0636	4.75E-08	0.0000	0.0000	4.69E-08
175	0.00	0.000	0.005	0.0133	0.4365	0.0742	5.54E-08	0.0000	0.0000	5.47E-08
176	0.00	0.000	0.001	0.0131	0.4590	0.0780	5.83E-08	0.0000	0.0000	5.75E-08
177	0.00	0.000	0.000	0.0130	0.4761	0.0809	6.05E-08	0.0000	0.0000	5.96E-08
178	0.00	0.000	0.000	0.0130	0.4752	0.0807	6.04E-08	0.0000	0.0000	5.95E-08
179	0.10	0.000	0.015	0.0272	0.4612	0.0784	5.86E-08	0.0000	0.0000	5.78E-08
180	0.00	0.000	0.024	0.0233	0.4501	0.0765	5.71E-08	0.0000	0.0000	5.64E-08
181	0.19	0.000	0.028	0.0503	0.4489	0.0763	5.70E-08	0.0000	0.0000	5.62E-08
182	0.00	0.000	0.028	0.0455	0.4559	0.0775	5.79E-08	0.0000	0.0000	5.71E-08
183	0.00	0.000	0.028	0.0407	0.4654	0.0791	5.91E-08	0.0000	0.0000	5.83E-08
184	0.14	0.000	0.029	0.0579	0.4735	0.0805	6.02E-08	0.0000	0.0000	5.93E-08
185	0.11	0.000	0.025	0.0634	0.4815	0.0818	6.12E-08	0.0000	0.0000	6.03E-08
186	0.01	0.000	0.159	0.0341	0.4814	0.0818	6.12E-08	0.0000	0.0000	6.03E-08
187	0.00	0.000	0.030	0.0269	0.4794	0.0815	6.09E-08	0.0000	0.0000	6.01E-08
188	0.01	0.000	0.025	0.0227	0.4789	0.0814	6.09E-08	0.0000	0.0000	6.00E-08
189	0.00	0.000	0.032	0.0158	0.4804	0.0816	6.10E-08	0.0000	0.0000	6.02E-08
190	0.00	0.000	0.013	0.0131	0.4918	0.0836	6.25E-08	0.0000	0.0000	6.16E-08
191	0.00	0.000	0.001	0.0130	0.4886	0.0830	6.21E-08	0.0000	0.0000	6.12E-08
192	0.00	0.000	0.000	0.0130	0.4780	0.0812	6.07E-08	0.0000	0.0000	5.99E-08
193	0.00	0.000	0.000	0.0130	0.4669	0.0793	5.93E-08	0.0000	0.0000	5.85E-08
194	0.00	0.000	0.000	0.0130	0.4494	0.0764	5.71E-08	0.0000	0.0000	5.63E-08
195	0.00	0.000	0.000	0.0130	0.4262	0.0724	5.41E-08	0.0000	0.0000	5.34E-08
196	0.15	0.000	0.015	0.0355	0.4027	0.0684	5.11E-08	0.0000	0.0000	5.04E-08

197	0.00	0.000	0.031	0.0303	0.3833	0.0651	4.86E-08	0.0000	0.0000	4.80E-08
198	0.01	0.000	0.042	0.0250	0.3695	0.0628	4.68E-08	0.0000	0.0000	4.62E-08
199	0.13	0.000	0.046	0.0390	0.3614	0.0614	4.58E-08	0.0000	0.0000	4.52E-08
200	0.44	0.000	0.180	0.0823	0.3570	0.0607	4.52E-08	0.0000	0.0000	4.47E-08
201	0.16	0.000	0.144	0.0626	0.3552	0.0604	4.50E-08	0.0000	0.0000	4.44E-08
202	0.32	0.000	0.229	0.0705	0.3518	0.0598	4.46E-08	0.0000	0.0000	4.40E-08
203	0.41	0.000	0.150	0.0913	0.3586	0.0609	4.54E-08	0.0000	0.0000	4.49E-08
204	0.00	0.000	0.071	0.0437	0.3446	0.0585	4.36E-08	0.0000	0.0000	4.31E-08
205	0.00	0.000	0.143	0.0169	0.3654	0.0621	4.63E-08	0.0000	0.0000	4.57E-08
206	0.00	0.000	0.012	0.0130	0.3335	0.0567	4.22E-08	0.0000	0.0000	4.17E-08
207	0.00	0.000	0.000	0.0130	0.3370	0.0573	4.27E-08	0.0000	0.0000	4.22E-08
208	0.00	0.000	0.000	0.0130	0.3599	0.0612	4.56E-08	0.0000	0.0000	4.50E-08
209	1.05	0.000	0.054	0.1790	0.3803	0.0646	4.82E-08	0.0000	0.0000	4.76E-08
210	0.12	0.000	0.148	0.0735	0.3895	0.0662	4.94E-08	0.0000	0.0000	4.88E-08
211	0.00	0.000	0.096	0.0170	0.3774	0.0641	4.78E-08	0.0000	0.0000	4.72E-08
212	0.43	0.000	0.147	0.0642	0.3730	0.0634	4.73E-08	0.0000	0.0000	4.67E-08
213	2.03	0.000	0.223	0.2147	0.3337	0.0567	4.22E-08	0.0000	0.0000	4.17E-08
214	0.04	0.000	0.171	0.0379	0.2402	0.0408	3.03E-08	0.0000	0.0000	3.00E-08
215	0.00	0.000	0.041	0.0278	0.2166	0.0368	2.73E-08	0.0000	0.0000	2.71E-08
216	0.00	0.000	0.073	0.0131	0.1998	0.0339	2.52E-08	0.0000	0.0000	2.50E-08
217	0.00	0.000	0.000	0.0130	0.1593	0.0271	2.01E-08	0.0000	0.0000	1.99E-08
218	0.00	0.000	0.000	0.0130	0.1371	0.0233	1.73E-08	0.0000	0.0000	1.71E-08
219	0.00	0.000	0.000	0.0130	0.1638	0.0278	2.06E-08	0.0000	0.0000	2.05E-08
220	0.00	0.000	0.000	0.0130	0.2068	0.0351	2.61E-08	0.0000	0.0000	2.58E-08
221	0.00	0.000	0.000	0.0130	0.2165	0.0368	2.73E-08	0.0000	0.0000	2.71E-08
222	0.00	0.000	0.000	0.0130	0.1692	0.0287	2.13E-08	0.0000	0.0000	2.11E-08
223	0.00	0.000	0.000	0.0130	0.1031	0.0175	1.30E-08	0.0000	0.0000	1.29E-08
224	0.00	0.000	0.000	0.0130	0.1149	0.0195	1.45E-08	0.0000	0.0000	1.44E-08
225	0.21	0.000	0.064	0.0373	0.2654	0.0451	3.35E-08	0.0000	0.0000	3.32E-08
226	0.00	0.000	0.071	0.0255	0.4117	0.0700	5.22E-08	0.0000	0.0000	5.15E-08
227	0.00	0.000	0.047	0.0178	0.5077	0.0863	6.46E-08	0.0000	0.0000	6.36E-08
228	0.41	0.000	0.085	0.0719	0.5634	0.0957	7.17E-08	0.0000	0.0000	7.07E-08
229	0.67	0.000	0.108	0.1372	0.5927	0.1007	7.55E-08	0.0000	0.0000	7.44E-08
230	0.38	0.000	0.117	0.1087	0.6051	0.1028	7.71E-08	0.0000	0.0000	7.59E-08

231	0.35	0.000	0.046	0.0959	0.6145	0.1044	7.84E-08	0.0000	0.0000	7.71E-08
232	0.00	0.000	0.042	0.0388	0.5824	0.0990	7.42E-08	0.0000	0.0000	7.31E-08
233	0.00	0.000	0.115	0.0185	0.6131	0.1042	7.82E-08	0.0000	0.0000	7.69E-08
234	0.00	0.000	0.027	0.0130	0.6342	0.1078	8.09E-08	0.0000	0.0000	7.96E-08
235	0.00	0.000	0.000	0.0130	0.6071	0.1032	7.74E-08	0.0000	0.0000	7.62E-08
236	0.00	0.000	0.000	0.0130	0.5718	0.0972	7.28E-08	0.0000	0.0000	7.17E-08
237	0.00	0.000	0.000	0.0130	0.5416	0.0920	6.89E-08	0.0000	0.0000	6.79E-08
238	0.00	0.000	0.000	0.0130	0.5016	0.0852	6.38E-08	0.0000	0.0000	6.29E-08
239	0.04	0.000	0.019	0.0165	0.4106	0.0698	5.21E-08	0.0000	0.0000	5.14E-08
240	0.00	0.000	0.014	0.0141	0.2676	0.0455	3.38E-08	0.0000	0.0000	3.35E-08
241	0.00	0.000	0.005	0.0133	0.1817	0.0309	2.29E-08	0.0000	0.0000	2.27E-08
242	0.21	0.000	0.044	0.0408	0.2430	0.0413	3.07E-08	0.0000	0.0000	3.04E-08
243	0.28	0.000	0.101	0.0707	0.3642	0.0619	4.61E-08	0.0000	0.0000	4.56E-08
244	0.00	0.000	0.052	0.0453	0.4597	0.0781	5.84E-08	0.0000	0.0000	5.76E-08
245	0.00	0.000	0.117	0.0220	0.5234	0.0889	6.66E-08	0.0000	0.0000	6.56E-08
246	0.00	0.000	0.041	0.0134	0.5524	0.0939	7.03E-08	0.0000	0.0000	6.93E-08
247	0.00	0.000	0.002	0.0130	0.5708	0.0970	7.27E-08	0.0000	0.0000	7.16E-08
248	0.00	0.000	0.000	0.0130	0.5835	0.0991	7.43E-08	0.0000	0.0000	7.32E-08
249	0.00	0.000	0.000	0.0130	0.5989	0.1018	7.63E-08	0.0000	0.0000	7.51E-08
250	0.42	0.000	0.044	0.0757	0.5845	0.0993	7.45E-08	0.0000	0.0000	7.33E-08
251	0.23	0.000	0.043	0.0760	0.5521	0.0938	7.03E-08	0.0000	0.0000	6.92E-08
252	0.86	0.000	0.048	0.1780	0.5134	0.0872	6.53E-08	0.0000	0.0000	6.43E-08
253	0.03	0.000	0.070	0.0778	0.5050	0.0858	6.42E-08	0.0000	0.0000	6.33E-08
254	0.01	0.000	0.031	0.0310	0.4622	0.0785	5.87E-08	0.0000	0.0000	5.79E-08
255	0.00	0.000	0.097	0.0148	0.4762	0.0809	6.05E-08	0.0000	0.0000	5.97E-08
256	0.00	0.000	0.008	0.0131	0.5017	0.0853	6.38E-08	0.0000	0.0000	6.29E-08
257	0.06	0.000	0.018	0.0201	0.5144	0.0874	6.54E-08	0.0000	0.0000	6.45E-08
258	0.02	0.000	0.032	0.0180	0.5152	0.0875	6.55E-08	0.0000	0.0000	6.46E-08
259	0.00	0.000	0.025	0.0139	0.4986	0.0847	6.34E-08	0.0000	0.0000	6.25E-08
260	0.02	0.000	0.018	0.0142	0.4435	0.0754	5.63E-08	0.0000	0.0000	5.55E-08
261	0.00	0.000	0.003	0.0136	0.3280	0.0557	4.15E-08	0.0000	0.0000	4.10E-08
262	0.00	0.000	0.003	0.0131	0.2039	0.0346	2.57E-08	0.0000	0.0000	2.55E-08
263	0.00	0.000	0.001	0.0130	0.1753	0.0298	2.21E-08	0.0000	0.0000	2.19E-08
264	0.00	0.000	0.000	0.0130	0.2544	0.0432	3.21E-08	0.0000	0.0000	3.18E-08

265			0.00	0.000	0.000	0.0130	0.3545	0.0602	4.49E-08	0.0000	0.0000	4.44E-08
266			0.60	0.000	0.036	0.1070	0.4302	0.0731	5.46E-08	0.0000	0.0000	5.39E-08
267			0.06	0.000	0.027	0.0659	0.4785	0.0813	6.08E-08	0.0000	0.0000	6.00E-08
268	*		0.03	0.000	0.018	0.0382	0.5022	0.0853	6.39E-08	0.0000	0.0000	6.30E-08
269			0.00	0.000	0.033	0.0324	0.5291	0.0899	6.73E-08	0.0000	0.0000	6.64E-08
270			0.00	0.000	0.048	0.0241	0.4997	0.0849	6.35E-08	0.0000	0.0000	6.26E-08
271			0.00	0.000	0.020	0.0209	0.5563	0.0945	7.08E-08	0.0000	0.0000	6.98E-08
272			0.00	0.000	0.047	0.0130	0.5871	0.0998	7.48E-08	0.0000	0.0000	7.36E-08
273			0.00	0.000	0.000	0.0130	0.5601	0.0952	7.13E-08	0.0000	0.0000	7.02E-08
274			0.00	0.000	0.000	0.0130	0.4975	0.0845	6.32E-08	0.0000	0.0000	6.23E-08
275			0.00	0.000	0.000	0.0130	0.4126	0.0701	5.23E-08	0.0000	0.0000	5.17E-08
276			0.33	0.000	0.019	0.0648	0.3269	0.0555	4.14E-08	0.0000	0.0000	4.09E-08
277			0.10	0.000	0.022	0.0536	0.2763	0.0469	3.49E-08	0.0000	0.0000	3.45E-08
278			0.04	0.000	0.052	0.0491	0.2768	0.0470	3.50E-08	0.0000	0.0000	3.46E-08
279	*		0.49	0.000	0.010	0.0513	0.3091	0.0525	3.91E-08	0.0000	0.0000	3.87E-08
280	*		0.00	0.000	0.009	0.0541	0.3439	0.0584	4.35E-08	0.0000	0.0000	4.30E-08
281			0.00	0.000	0.000	0.1096	0.3961	0.0673	5.02E-08	0.0000	0.0000	4.96E-08
282			0.05	0.000	0.026	0.0540	0.4250	0.0722	5.39E-08	0.0000	0.0000	5.32E-08
283			0.15	0.000	0.050	0.0617	0.4469	0.0759	5.67E-08	0.0000	0.0000	5.60E-08
284			0.03	0.000	0.051	0.0519	0.4138	0.0703	5.25E-08	0.0000	0.0000	5.18E-08
285			0.00	0.000	0.018	0.0480	0.3559	0.0605	4.51E-08	0.0000	0.0000	4.45E-08
286			0.00	0.000	0.030	0.0419	0.3901	0.0663	4.95E-08	0.0000	0.0000	4.88E-08
287			0.63	0.000	0.021	0.1373	0.4149	0.0705	5.26E-08	0.0000	0.0000	5.19E-08
288			0.12	0.000	0.044	0.0774	0.4283	0.0728	5.44E-08	0.0000	0.0000	5.36E-08
289			0.08	0.000	0.018	0.0552	0.4215	0.0716	5.35E-08	0.0000	0.0000	5.28E-08
290	*		0.10	0.000	0.012	0.0585	0.4135	0.0703	5.25E-08	0.0000	0.0000	5.18E-08
291			0.00	0.000	0.030	0.0625	0.3108	0.0528	3.93E-08	0.0000	0.0000	3.89E-08
292			0.24	0.000	0.032	0.0799	0.2065	0.0351	2.60E-08	0.0000	0.0000	2.58E-08
293			0.02	0.000	0.018	0.0484	0.2247	0.0382	2.84E-08	0.0000	0.0000	2.81E-08
294			0.03	0.000	0.017	0.0460	0.3092	0.0525	3.91E-08	0.0000	0.0000	3.87E-08
295	*		0.00	0.000	0.023	0.0405	0.3059	0.0520	3.87E-08	0.0000	0.0000	3.83E-08
296			0.18	0.000	0.039	0.0631	0.2041	0.0347	2.57E-08	0.0000	0.0000	2.55E-08
297			0.03	0.000	0.022	0.0557	0.2110	0.0359	2.66E-08	0.0000	0.0000	2.64E-08
298	*		0.06	0.000	0.012	0.0556	0.2718	0.0462	3.43E-08	0.0000	0.0000	3.40E-08

299	*	1.05	0.000	0.010	0.0566	0.3360	0.0571	4.25E-08	0.0000	0.0000	4.20E-08
300	*	0.01	0.000	0.010	0.0593	0.2968	0.0504	3.75E-08	0.0000	0.0000	3.71E-08
301		0.00	0.000	0.009	0.0610	0.2273	0.0386	2.87E-08	0.0000	0.0000	2.84E-08
302		0.00	0.000	0.000	0.0759	0.1973	0.0335	2.49E-08	0.0000	0.0000	2.46E-08
303	*	0.00	0.000	0.010	0.0535	0.2284	0.0388	2.88E-08	0.0000	0.0000	2.85E-08
304		0.02	0.000	0.000	0.1658	0.2835	0.0482	3.58E-08	0.0000	0.0000	3.55E-08
305		0.00	0.000	0.033	0.0764	0.2747	0.0467	3.47E-08	0.0000	0.0000	3.43E-08
306		0.00	0.000	0.023	0.0307	0.4190	0.0712	5.32E-08	0.0000	0.0000	5.25E-08
307	*	0.00	0.000	0.015	0.0273	0.4456	0.0757	5.66E-08	0.0000	0.0000	5.58E-08
308		0.00	0.000	0.014	0.0245	0.4380	0.0744	5.56E-08	0.0000	0.0000	5.48E-08
309		0.00	0.000	0.012	0.0223	0.4441	0.0755	5.64E-08	0.0000	0.0000	5.56E-08
310		0.00	0.000	0.015	0.0193	0.4599	0.0781	5.84E-08	0.0000	0.0000	5.76E-08
311		0.00	0.000	0.012	0.0162	0.4612	0.0784	5.86E-08	0.0000	0.0000	5.78E-08
312		0.10	0.000	0.017	0.0298	0.4203	0.0714	5.33E-08	0.0000	0.0000	5.26E-08
313		0.00	0.000	0.011	0.0280	0.3135	0.0533	3.97E-08	0.0000	0.0000	3.92E-08
314		0.00	0.000	0.011	0.0262	0.1939	0.0329	2.45E-08	0.0000	0.0000	2.42E-08
315	*	0.03	0.000	0.010	0.0295	0.1836	0.0312	2.31E-08	0.0000	0.0000	2.29E-08
316	*	0.00	0.000	0.010	0.0279	0.2838	0.0482	3.59E-08	0.0000	0.0000	3.55E-08
317		0.00	0.000	0.013	0.0257	0.3884	0.0660	4.92E-08	0.0000	0.0000	4.86E-08
318		0.00	0.000	0.016	0.0230	0.4623	0.0785	5.87E-08	0.0000	0.0000	5.79E-08
319		0.01	0.000	0.020	0.0214	0.5084	0.0864	6.47E-08	0.0000	0.0000	6.37E-08
320	*	0.00	0.000	0.009	0.0198	0.5346	0.0908	6.80E-08	0.0000	0.0000	6.70E-08
321		0.00	0.000	0.013	0.0177	0.5481	0.0931	6.98E-08	0.0000	0.0000	6.87E-08
322		0.00	0.000	0.015	0.0152	0.5526	0.0939	7.04E-08	0.0000	0.0000	6.93E-08
323	*	0.48	0.000	0.009	0.0185	0.5519	0.0938	7.03E-08	0.0000	0.0000	6.92E-08
324	*	0.02	0.000	0.009	0.0217	0.5478	0.0931	6.97E-08	0.0000	0.0000	6.87E-08
325	*	0.00	0.000	0.009	0.0250	0.5407	0.0919	6.88E-08	0.0000	0.0000	6.78E-08
326		0.00	0.000	0.010	0.0283	0.5328	0.0905	6.78E-08	0.0000	0.0000	6.68E-08
327		0.00	0.000	0.000	0.0925	0.5241	0.0891	6.67E-08	0.0000	0.0000	6.57E-08
328		0.23	0.000	0.016	0.0817	0.5146	0.0874	6.55E-08	0.0000	0.0000	6.45E-08
329		0.18	0.000	0.016	0.0714	0.5015	0.0852	6.38E-08	0.0000	0.0000	6.29E-08
330	*	0.24	0.000	0.009	0.0546	0.5030	0.0855	6.40E-08	0.0000	0.0000	6.30E-08
331	*	0.86	0.000	0.009	0.0557	0.4706	0.0800	5.98E-08	0.0000	0.0000	5.90E-08
332	*	0.32	0.000	0.008	0.0567	0.4744	0.0806	6.03E-08	0.0000	0.0000	5.94E-08

333	*			0.00	0.000	0.009	0.0593	0.4939	0.0839	6.28E-08	0.0000	0.0000	6.19E-08
334	*			0.00	0.000	0.010	0.0598	0.5099	0.0866	6.48E-08	0.0000	0.0000	6.39E-08
335	*			0.04	0.000	0.000	0.0598	0.4837	0.0822	6.15E-08	0.0000	0.0000	6.06E-08
336	*			0.00	0.000	0.008	0.0598	0.4592	0.0780	5.83E-08	0.0000	0.0000	5.75E-08
337	*			0.00	0.000	0.009	0.0598	0.4226	0.0718	5.36E-08	0.0000	0.0000	5.29E-08
338				0.00	0.000	0.000	0.1012	0.3556	0.0604	4.50E-08	0.0000	0.0000	4.45E-08
339				0.19	0.000	0.000	0.1748	0.2556	0.0434	3.23E-08	0.0000	0.0000	3.20E-08
340	*			0.23	0.000	0.009	0.0821	0.2160	0.0367	2.73E-08	0.0000	0.0000	2.70E-08
341	*			0.00	0.000	0.008	0.0420	0.1474	0.0250	1.86E-08	0.0000	0.0000	1.84E-08
342	*			0.01	0.000	0.000	0.0444	0.1599	0.0272	2.01E-08	0.0000	0.0000	2.00E-08
343	*			0.00	0.000	0.007	0.0472	0.2466	0.0419	3.11E-08	0.0000	0.0000	3.08E-08
344				0.00	0.000	0.010	0.0502	0.3224	0.0548	4.08E-08	0.0000	0.0000	4.03E-08
345	*			0.00	0.000	0.009	0.0532	0.3677	0.0625	4.66E-08	0.0000	0.0000	4.60E-08
346				0.00	0.000	0.010	0.0563	0.3928	0.0667	4.98E-08	0.0000	0.0000	4.92E-08
347	*			0.00	0.000	0.008	0.0595	0.3941	0.0670	5.00E-08	0.0000	0.0000	4.93E-08
348	*			0.00	0.000	0.007	0.0598	0.3449	0.0586	4.37E-08	0.0000	0.0000	4.32E-08
349	*	*		0.00	0.000	0.009	0.0598	0.2444	0.0415	3.09E-08	0.0000	0.0000	3.06E-08
350		*		0.00	0.000	0.000	0.0839	0.1525	0.0259	1.92E-08	0.0000	0.0000	1.91E-08
351	*	*		0.00	0.000	0.009	0.0839	0.1391	0.0236	1.75E-08	0.0000	0.0000	1.74E-08
352	*	*		0.01	0.000	0.008	0.0839	0.2437	0.0414	3.08E-08	0.0000	0.0000	3.05E-08
353	*	*		0.00	0.000	0.008	0.0839	0.3489	0.0593	4.42E-08	0.0000	0.0000	4.36E-08
354	*	*		0.08	0.000	0.006	0.0839	0.4156	0.0706	5.27E-08	0.0000	0.0000	5.20E-08
355	*	*		0.00	0.000	0.007	0.0839	0.4533	0.0770	5.76E-08	0.0000	0.0000	5.68E-08
356	*	*		0.00	0.000	0.000	0.0839	0.4740	0.0806	6.02E-08	0.0000	0.0000	5.94E-08
357	*	*		0.13	0.000	0.008	0.0839	0.4849	0.0824	6.16E-08	0.0000	0.0000	6.08E-08
358	*	*		0.55	0.000	0.006	0.0839	0.4897	0.0832	6.22E-08	0.0000	0.0000	6.14E-08
359	*	*		0.30	0.000	0.005	0.0839	0.4904	0.0833	6.23E-08	0.0000	0.0000	6.14E-08
360	*	*		0.22	0.000	0.005	0.0839	0.4883	0.0830	6.21E-08	0.0000	0.0000	6.12E-08
361	*	*		0.33	0.000	0.000	0.0839	0.4843	0.0823	6.16E-08	0.0000	0.0000	6.07E-08
362	*	*		0.25	0.000	0.005	0.0839	0.4790	0.0814	6.09E-08	0.0000	0.0000	6.00E-08
363	*	*		0.37	0.000	0.004	0.0839	0.4728	0.0803	6.01E-08	0.0000	0.0000	5.92E-08
364	*	*		0.10	0.000	0.000	0.0839	0.4660	0.0792	5.92E-08	0.0000	0.0000	5.84E-08
365	*	*		0.00	0.000	0.004	0.0839	0.4588	0.0780	5.83E-08	0.0000	0.0000	5.75E-08

* = Frozen (air or soil)

Annual Totals for Year 2			
	inches	cubic feet	percent
Precipitation	37.10	1,010,047.5	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	8.904	242,406.0	24.00
Drainage Collected from Layer 3	28.5636	777,645.2	76.99
Percolation/Leakage through Layer 5	0.000022	0.5895	0.00
Average Head on Top of Layer 4	0.4605	---	---
Drainage Collected from Layer 6	0.0000	0.0113	0.00
Percolation/Leakage through Layer 7	0.000021	0.5782	0.00
Average Head on Top of Layer 7	0.0000	---	---
Change in Water Storage	-0.3675	-10,004.3	-0.99
Soil Water at Start of Year	27.0521	736,493.6	72.92
Soil Water at End of Year	29.4934	802,957.9	79.50
Snow Water at Start of Year	5.1939	141,404.4	14.00
Snow Water at End of Year	2.3852	64,935.9	6.43
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 3

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 7
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 6
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 7

Title: WPC-Ore Pad Liner
Simulated On: 4/1/2026 23:24

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1	*	*	0.05	0.000	0.000	0.0839	0.4513	0.0767	5.73E-08	0.0000	0.0000	5.65E-08
2	*	*	0.03	0.000	0.003	0.0839	0.4438	0.0754	5.63E-08	0.0000	0.0000	5.56E-08
3	*	*	0.00	0.000	0.003	0.0839	0.4363	0.0741	5.54E-08	0.0000	0.0000	5.46E-08
4	*	*	0.00	0.000	0.000	0.0839	0.4288	0.0729	5.44E-08	0.0000	0.0000	5.37E-08
5	*	*	0.00	0.000	0.000	0.0839	0.4214	0.0716	5.35E-08	0.0000	0.0000	5.28E-08
6	*	*	0.12	0.000	0.000	0.0839	0.4141	0.0704	5.25E-08	0.0000	0.0000	5.18E-08
7	*	*	0.06	0.000	0.003	0.0839	0.4069	0.0691	5.16E-08	0.0000	0.0000	5.09E-08
8	*	*	0.00	0.000	0.000	0.0839	0.3998	0.0679	5.07E-08	0.0000	0.0000	5.00E-08
9		*	0.00	0.000	0.000	0.0839	0.3929	0.0668	4.98E-08	0.0000	0.0000	4.92E-08
10		*	0.00	0.000	0.009	0.0847	0.3862	0.0656	4.90E-08	0.0000	0.0000	4.83E-08
11	*	*	0.09	0.000	0.008	0.0847	0.3796	0.0645	4.81E-08	0.0000	0.0000	4.75E-08
12	*	*	0.09	0.000	0.008	0.0847	0.3732	0.0634	4.73E-08	0.0000	0.0000	4.67E-08
13	*	*	0.00	0.000	0.005	0.0847	0.3669	0.0624	4.65E-08	0.0000	0.0000	4.59E-08
14	*	*	0.07	0.000	0.006	0.0847	0.3608	0.0613	4.57E-08	0.0000	0.0000	4.52E-08
15	*	*	0.02	0.000	0.007	0.0847	0.3549	0.0603	4.50E-08	0.0000	0.0000	4.44E-08
16	*	*	0.11	0.000	0.005	0.0847	0.3491	0.0593	4.42E-08	0.0000	0.0000	4.37E-08
17	*	*	0.06	0.000	0.003	0.0847	0.3435	0.0584	4.35E-08	0.0000	0.0000	4.30E-08
18	*	*	0.02	0.000	0.003	0.0847	0.3380	0.0574	4.28E-08	0.0000	0.0000	4.23E-08
19	*	*	0.01	0.000	0.004	0.0847	0.3327	0.0565	4.21E-08	0.0000	0.0000	4.16E-08
20	*	*	0.00	0.000	0.005	0.0847	0.3274	0.0556	4.14E-08	0.0000	0.0000	4.10E-08
21	*	*	0.02	0.000	0.000	0.0847	0.3224	0.0548	4.08E-08	0.0000	0.0000	4.03E-08
22	*	*	0.01	0.000	0.000	0.0847	0.3174	0.0539	4.02E-08	0.0000	0.0000	3.97E-08
23	*	*	0.00	0.000	0.000	0.0847	0.3126	0.0531	3.95E-08	0.0000	0.0000	3.91E-08
24	*	*	0.01	0.000	0.005	0.0847	0.3079	0.0523	3.90E-08	0.0000	0.0000	3.85E-08
25	*	*	0.01	0.000	0.000	0.0847	0.3034	0.0515	3.84E-08	0.0000	0.0000	3.79E-08
26	*	*	0.00	0.000	0.000	0.0847	0.2989	0.0508	3.78E-08	0.0000	0.0000	3.74E-08

27	*	*	0.00	0.000	0.006	0.0847	0.2946	0.0501	3.72E-08	0.0000	0.0000	3.68E-08
28	*	*	0.01	0.000	0.006	0.0847	0.2903	0.0493	3.67E-08	0.0000	0.0000	3.63E-08
29	*	*	0.02	0.000	0.005	0.0847	0.2862	0.0486	3.62E-08	0.0000	0.0000	3.58E-08
30	*	*	0.02	0.000	0.005	0.0847	0.2822	0.0479	3.57E-08	0.0000	0.0000	3.53E-08
31	*	*	0.00	0.000	0.005	0.0847	0.2783	0.0473	3.52E-08	0.0000	0.0000	3.48E-08
32	*	*	0.30	0.000	0.000	0.0847	0.2744	0.0466	3.47E-08	0.0000	0.0000	3.43E-08
33	*	*	0.00	0.000	0.004	0.0847	0.2707	0.0460	3.42E-08	0.0000	0.0000	3.39E-08
34	*	*	0.18	0.000	0.000	0.0847	0.2670	0.0454	3.37E-08	0.0000	0.0000	3.34E-08
35	*	*	0.21	0.000	0.005	0.0847	0.2635	0.0448	3.33E-08	0.0000	0.0000	3.29E-08
36	*	*	0.00	0.000	0.005	0.0847	0.2600	0.0442	3.28E-08	0.0000	0.0000	3.25E-08
37	*	*	0.00	0.000	0.000	0.0847	0.2566	0.0436	3.24E-08	0.0000	0.0000	3.21E-08
38	*	*	0.00	0.000	0.000	0.0847	0.2533	0.0430	3.20E-08	0.0000	0.0000	3.17E-08
39	*	*	0.00	0.000	0.000	0.0847	0.2500	0.0425	3.16E-08	0.0000	0.0000	3.13E-08
40	*	*	0.00	0.000	0.000	0.0847	0.2468	0.0419	3.12E-08	0.0000	0.0000	3.09E-08
41	*	*	0.10	0.000	0.007	0.0847	0.2437	0.0414	3.08E-08	0.0000	0.0000	3.05E-08
42	*	*	0.06	0.000	0.005	0.0847	0.2407	0.0409	3.04E-08	0.0000	0.0000	3.01E-08
43	*	*	0.00	0.000	0.007	0.0847	0.2378	0.0404	3.00E-08	0.0000	0.0000	2.97E-08
44	*	*	0.04	0.000	0.005	0.0847	0.2349	0.0399	2.96E-08	0.0000	0.0000	2.94E-08
45	*	*	0.00	0.000	0.000	0.0847	0.2320	0.0394	2.93E-08	0.0000	0.0000	2.90E-08
46	*	*	0.03	0.000	0.000	0.0847	0.2292	0.0390	2.89E-08	0.0000	0.0000	2.87E-08
47	*	*	0.13	0.000	0.000	0.0847	0.2265	0.0385	2.86E-08	0.0000	0.0000	2.83E-08
48	*	*	0.06	0.000	0.003	0.0847	0.2239	0.0380	2.83E-08	0.0000	0.0000	2.80E-08
49	*	*	0.00	0.000	0.000	0.0847	0.2213	0.0376	2.79E-08	0.0000	0.0000	2.77E-08
50		*	0.13	0.000	0.000	0.0907	0.2187	0.0372	2.76E-08	0.0000	0.0000	2.73E-08
51	*	*	0.53	0.000	0.006	0.0926	0.2162	0.0367	2.73E-08	0.0000	0.0000	2.70E-08
52	*	*	0.38	0.000	0.006	0.0926	0.2138	0.0363	2.70E-08	0.0000	0.0000	2.67E-08
53	*	*	0.00	0.000	0.003	0.0926	0.2114	0.0359	2.67E-08	0.0000	0.0000	2.64E-08
54	*	*	0.00	0.000	0.000	0.0926	0.2090	0.0355	2.64E-08	0.0000	0.0000	2.61E-08
55	*	*	0.19	0.000	0.000	0.0926	0.2067	0.0351	2.61E-08	0.0000	0.0000	2.58E-08
56	*	*	1.01	0.000	0.006	0.0926	0.2045	0.0347	2.58E-08	0.0000	0.0000	2.56E-08
57	*	*	0.18	0.000	0.006	0.0926	0.2023	0.0344	2.55E-08	0.0000	0.0000	2.53E-08
58	*	*	0.10	0.000	0.005	0.0926	0.2001	0.0340	2.52E-08	0.0000	0.0000	2.50E-08
59	*	*	0.00	0.000	0.005	0.0926	0.1980	0.0336	2.50E-08	0.0000	0.0000	2.47E-08
60	*	*	0.11	0.000	0.003	0.0926	0.1959	0.0333	2.47E-08	0.0000	0.0000	2.45E-08

61	*	*	0.01	0.000	0.004	0.0926	0.1939	0.0329	2.44E-08	0.0000	0.0000	2.42E-08
62	*	*	0.18	0.000	0.003	0.0926	0.1919	0.0326	2.42E-08	0.0000	0.0000	2.40E-08
63	*	*	0.05	0.000	0.002	0.0926	0.1899	0.0323	2.39E-08	0.0000	0.0000	2.37E-08
64	*	*	0.00	0.000	0.000	0.0926	0.1880	0.0319	2.37E-08	0.0000	0.0000	2.35E-08
65	*	*	0.03	0.000	0.000	0.0926	0.1861	0.0316	2.35E-08	0.0000	0.0000	2.32E-08
66	*	*	0.01	0.000	0.003	0.0926	0.1842	0.0313	2.32E-08	0.0000	0.0000	2.30E-08
67	*	*	0.90	0.000	0.000	0.0926	0.1824	0.0310	2.30E-08	0.0000	0.0000	2.28E-08
68	*	*	1.03	0.000	0.000	0.0926	0.1806	0.0307	2.28E-08	0.0000	0.0000	2.26E-08
69	*	*	0.48	0.000	0.004	0.0926	0.1788	0.0304	2.25E-08	0.0000	0.0000	2.23E-08
70	*	*	0.02	0.000	0.005	0.0926	0.1771	0.0301	2.23E-08	0.0000	0.0000	2.21E-08
71	*	*	0.00	0.000	0.005	0.0926	0.1754	0.0298	2.21E-08	0.0000	0.0000	2.19E-08
72		*	0.02	0.000	0.000	0.0926	0.1737	0.0295	2.19E-08	0.0000	0.0000	2.17E-08
73	*	*	0.00	0.000	0.007	0.0926	0.1721	0.0292	2.17E-08	0.0000	0.0000	2.15E-08
74	*	*	0.78	0.000	0.000	0.0926	0.1705	0.0290	2.15E-08	0.0000	0.0000	2.13E-08
75	*	*	0.01	0.000	0.005	0.0926	0.1689	0.0287	2.13E-08	0.0000	0.0000	2.11E-08
76	*	*	0.00	0.000	0.000	0.0926	0.1673	0.0284	2.11E-08	0.0000	0.0000	2.09E-08
77	*	*	0.00	0.000	0.000	0.0926	0.1658	0.0282	2.09E-08	0.0000	0.0000	2.07E-08
78	*	*	0.01	0.000	0.000	0.0926	0.1643	0.0279	2.07E-08	0.0000	0.0000	2.05E-08
79	*	*	0.01	0.000	0.009	0.0926	0.1628	0.0277	2.05E-08	0.0000	0.0000	2.03E-08
80	*	*	0.32	0.000	0.004	0.0926	0.1613	0.0274	2.03E-08	0.0000	0.0000	2.02E-08
81	*	*	0.02	0.000	0.005	0.0926	0.1599	0.0272	2.01E-08	0.0000	0.0000	2.00E-08
82	*	*	0.00	0.000	0.009	0.0926	0.1585	0.0269	2.00E-08	0.0000	0.0000	1.98E-08
83	*	*	0.04	0.000	0.006	0.0926	0.1571	0.0267	1.98E-08	0.0000	0.0000	1.96E-08
84	*	*	0.01	0.000	0.007	0.0926	0.1557	0.0265	1.96E-08	0.0000	0.0000	1.95E-08
85	*	*	0.00	0.000	0.004	0.0926	0.1544	0.0262	1.94E-08	0.0000	0.0000	1.93E-08
86	*	*	0.00	0.000	0.005	0.0926	0.1530	0.0260	1.93E-08	0.0000	0.0000	1.91E-08
87		*	0.00	0.000	0.000	0.0926	0.1517	0.0258	1.91E-08	0.0000	0.0000	1.90E-08
88		*	0.01	0.000	0.000	0.0926	0.1505	0.0256	1.89E-08	0.0000	0.0000	1.88E-08
89	*	*	0.01	0.000	0.015	0.0926	0.1492	0.0254	1.88E-08	0.0000	0.0000	1.86E-08
90	*	*	0.04	0.000	0.014	0.0926	0.1480	0.0251	1.86E-08	0.0000	0.0000	1.85E-08
91	*	*	0.02	0.000	0.008	0.0926	0.1467	0.0249	1.85E-08	0.0000	0.0000	1.83E-08
92	*	*	0.01	0.000	0.017	0.0926	0.1455	0.0247	1.83E-08	0.0000	0.0000	1.82E-08
93	*	*	0.23	0.000	0.016	0.0926	0.1443	0.0245	1.82E-08	0.0000	0.0000	1.80E-08
94	*	*	0.01	0.000	0.013	0.0926	0.1432	0.0243	1.80E-08	0.0000	0.0000	1.79E-08

95	*	*	0.00	0.000	0.013	0.0926	0.1420	0.0241	1.79E-08	0.0000	0.0000	1.77E-08
96	*	*	0.00	0.000	0.012	0.0926	0.1409	0.0239	1.77E-08	0.0000	0.0000	1.76E-08
97		*	0.00	0.000	0.005	0.1092	0.1397	0.0237	1.76E-08	0.0000	0.0000	1.75E-08
98		*	0.00	0.000	0.000	0.1596	0.1386	0.0236	1.75E-08	0.0000	0.0000	1.73E-08
99	*	*	0.01	0.000	0.010	0.1747	0.1376	0.0234	1.73E-08	0.0000	0.0000	1.72E-08
100		*	0.30	0.000	0.000	0.2464	0.1365	0.0232	1.72E-08	0.0000	0.0000	1.71E-08
101		*	1.47	0.000	0.000	0.3970	0.1333	0.0227	1.68E-08	0.0000	0.0000	1.67E-08
102		*	0.85	0.000	0.000	0.3970	0.1323	0.0225	1.66E-08	0.0000	0.0000	1.65E-08
103		*	0.00	0.000	0.000	0.3970	0.1461	0.0248	1.84E-08	0.0000	0.0000	1.83E-08
104		*	0.03	0.000	0.000	0.3970	0.1403	0.0238	1.77E-08	0.0000	0.0000	1.75E-08
105		*	0.07	0.000	0.000	0.3970	0.1251	0.0213	1.57E-08	0.0000	0.0000	1.56E-08
106		*	0.00	0.000	0.000	0.3970	0.1146	0.0195	1.44E-08	0.0000	0.0000	1.43E-08
107		*	0.02	0.000	0.000	0.3970	0.1135	0.0193	1.43E-08	0.0000	0.0000	1.42E-08
108		*	0.33	0.000	0.000	0.3970	0.1197	0.0203	1.51E-08	0.0000	0.0000	1.50E-08
109		*	0.13	0.000	0.002	0.3970	0.1313	0.0223	1.65E-08	0.0000	0.0000	1.64E-08
110	*	*	0.00	0.000	0.000	0.3970	0.1279	0.0217	1.61E-08	0.0000	0.0000	1.60E-08
111	*	*	0.00	0.000	0.000	0.3970	0.1520	0.0258	1.91E-08	0.0000	0.0000	1.90E-08
112	*	*	0.32	0.000	0.023	0.3970	0.1959	0.0333	2.47E-08	0.0000	0.0000	2.45E-08
113	*	*	0.00	0.000	0.028	0.3970	1.0306	0.1751	1.33E-07	0.0000	0.0000	1.30E-07
114		*	0.17	0.000	0.047	0.3970	1.6862	0.2865	2.21E-07	0.0000	0.0000	2.15E-07
115	*	*	0.22	0.000	0.026	0.3970	2.0153	0.3424	2.65E-07	0.0000	0.0000	2.58E-07
116	*	*	0.01	0.000	0.027	0.3970	2.1235	0.3608	2.80E-07	0.0000	0.0000	2.72E-07
117		*	0.00	0.000	0.082	0.3970	1.7618	0.2994	2.31E-07	0.0000	0.0000	2.25E-07
118	*	*	0.14	0.000	0.086	0.3970	1.7595	0.2990	2.30E-07	0.0000	0.0000	2.24E-07
119		*	0.03	0.000	0.084	0.3970	1.8645	0.3168	2.45E-07	0.0000	0.0000	2.38E-07
120		*	0.12	0.000	0.001	0.3970	1.7645	0.2998	2.31E-07	0.0000	0.0000	2.25E-07
121		*	0.00	0.000	0.000	0.3970	1.6922	0.2875	2.21E-07	0.0000	0.0000	2.15E-07
122	*	*	0.02	0.000	0.020	0.3970	1.7077	0.2902	2.23E-07	0.0000	0.0000	2.17E-07
123	*	*	0.03	0.000	0.026	0.3970	1.5823	0.2689	2.06E-07	0.0000	0.0000	2.01E-07
124		*	0.00	0.000	0.004	0.3970	1.4631	0.2486	1.90E-07	0.0000	0.0000	1.86E-07
125	*	*	0.27	0.000	0.016	0.3970	1.4047	0.2387	1.83E-07	0.0000	0.0000	1.78E-07
126		*	0.24	0.000	0.000	0.3970	1.3653	0.2320	1.77E-07	0.0000	0.0000	1.73E-07
127		*	0.02	0.000	0.001	0.3970	1.3167	0.2237	1.71E-07	0.0000	0.0000	1.67E-07
128		*	0.48	0.000	0.001	0.3970	1.3435	0.2283	1.74E-07	0.0000	0.0000	1.70E-07

129		*	1.89	0.000	0.001	0.3970	1.3011	0.2211	1.69E-07	0.0000	0.0000	1.65E-07
130		*	0.01	0.000	0.001	0.3970	1.0106	0.1717	1.30E-07	0.0000	0.0000	1.28E-07
131		*	0.00	0.000	0.000	0.3970	0.8703	0.1479	1.12E-07	0.0000	0.0000	1.10E-07
132		*	0.19	0.000	0.001	0.3970	0.8580	0.1458	1.10E-07	0.0000	0.0000	1.08E-07
133		*	0.02	0.000	0.001	0.3970	0.6508	0.1106	8.31E-08	0.0000	0.0000	8.17E-08
134		*	0.04	0.000	0.001	0.3970	0.9826	0.1670	1.26E-07	0.0000	0.0000	1.24E-07
135		*	0.01	0.000	0.001	0.3970	1.1384	0.1934	1.47E-07	0.0000	0.0000	1.44E-07
136			0.10	0.000	0.072	0.0188	1.2918	0.2195	1.67E-07	0.0000	0.0000	1.64E-07
137			0.01	0.000	0.015	0.0179	1.4526	0.2468	1.89E-07	0.0000	0.0000	1.84E-07
138			0.00	0.000	0.024	0.0139	1.5702	0.2668	2.05E-07	0.0000	0.0000	2.00E-07
139			0.00	0.000	0.004	0.0132	2.0502	0.3484	2.70E-07	0.0000	0.0000	2.62E-07
140	*		0.00	0.000	0.001	0.0130	2.2401	0.3806	2.96E-07	0.0000	0.0000	2.87E-07
141			0.00	0.000	0.000	0.0130	2.2673	0.3853	3.00E-07	0.0000	0.0000	2.91E-07
142			0.00	0.000	0.000	0.0130	2.2094	0.3754	2.92E-07	0.0000	0.0000	2.83E-07
143			0.00	0.000	0.000	0.0130	2.1088	0.3583	2.78E-07	0.0000	0.0000	2.70E-07
144			0.00	0.000	0.000	0.0130	1.9917	0.3384	2.62E-07	0.0000	0.0000	2.55E-07
145			0.00	0.000	0.000	0.0130	1.8716	0.3180	2.46E-07	0.0000	0.0000	2.39E-07
146			0.02	0.000	0.004	0.0156	1.7557	0.2983	2.30E-07	0.0000	0.0000	2.24E-07
147			0.01	0.000	0.014	0.0149	1.6471	0.2799	2.15E-07	0.0000	0.0000	2.10E-07
148			0.00	0.000	0.009	0.0134	1.5472	0.2629	2.02E-07	0.0000	0.0000	1.97E-07
149			0.00	0.000	0.002	0.0131	1.4560	0.2474	1.89E-07	0.0000	0.0000	1.85E-07
150			0.03	0.000	0.003	0.0174	1.3732	0.2333	1.78E-07	0.0000	0.0000	1.74E-07
151			0.01	0.000	0.011	0.0173	1.2978	0.2205	1.68E-07	0.0000	0.0000	1.64E-07
152			0.00	0.000	0.013	0.0152	1.2303	0.2091	1.59E-07	0.0000	0.0000	1.56E-07
153			0.00	0.000	0.011	0.0134	1.1684	0.1985	1.51E-07	0.0000	0.0000	1.48E-07
154			0.00	0.000	0.001	0.0130	1.1115	0.1889	1.43E-07	0.0000	0.0000	1.40E-07
155			0.02	0.000	0.003	0.0158	1.0594	0.1800	1.37E-07	0.0000	0.0000	1.34E-07
156			0.36	0.000	0.009	0.0744	1.0117	0.1719	1.30E-07	0.0000	0.0000	1.28E-07
157			0.00	0.000	0.013	0.0409	0.9696	0.1648	1.25E-07	0.0000	0.0000	1.22E-07
158			0.07	0.000	0.019	0.0483	0.9303	0.1581	1.20E-07	0.0000	0.0000	1.17E-07
159			0.66	0.000	0.019	0.1472	0.8899	0.1512	1.14E-07	0.0000	0.0000	1.12E-07
160			0.00	0.000	0.136	0.0498	0.8626	0.1466	1.11E-07	0.0000	0.0000	1.09E-07
161			0.00	0.000	0.056	0.0259	0.8258	0.1403	1.06E-07	0.0000	0.0000	1.04E-07
162			0.08	0.000	0.097	0.0212	0.7513	0.1277	9.61E-08	0.0000	0.0000	9.44E-08

163	0.02	0.000	0.049	0.0163	0.7832	0.1331	1.00E-07	0.0000	0.0000	9.85E-08
164	0.06	0.000	0.029	0.0214	0.7762	0.1319	9.94E-08	0.0000	0.0000	9.76E-08
165	0.79	0.000	0.073	0.1409	0.7144	0.1214	9.13E-08	0.0000	0.0000	8.98E-08
166	0.09	0.000	0.178	0.0634	0.6028	0.1024	7.69E-08	0.0000	0.0000	7.56E-08
167	0.00	0.000	0.052	0.0277	0.4612	0.0784	5.86E-08	0.0000	0.0000	5.78E-08
168	0.00	0.000	0.054	0.0181	0.3404	0.0578	4.31E-08	0.0000	0.0000	4.26E-08
169	0.00	0.000	0.022	0.0131	0.3926	0.0667	4.98E-08	0.0000	0.0000	4.92E-08
170	0.07	0.000	0.023	0.0210	0.5369	0.0912	6.83E-08	0.0000	0.0000	6.73E-08
171	0.41	0.000	0.094	0.0736	0.5594	0.0950	7.12E-08	0.0000	0.0000	7.01E-08
172	0.00	0.000	0.052	0.0408	0.4921	0.0836	6.26E-08	0.0000	0.0000	6.17E-08
173	0.01	0.000	0.063	0.0286	0.3869	0.0657	4.90E-08	0.0000	0.0000	4.84E-08
174	0.04	0.000	0.051	0.0245	0.3333	0.0566	4.22E-08	0.0000	0.0000	4.17E-08
175	0.12	0.000	0.129	0.0221	0.3942	0.0670	5.00E-08	0.0000	0.0000	4.93E-08
176	0.25	0.000	0.092	0.0485	0.4875	0.0828	6.20E-08	0.0000	0.0000	6.11E-08
177	0.90	0.000	0.207	0.1641	0.5153	0.0876	6.55E-08	0.0000	0.0000	6.46E-08
178	0.00	0.000	0.119	0.0640	0.5184	0.0881	6.59E-08	0.0000	0.0000	6.50E-08
179	0.00	0.000	0.094	0.0141	0.5226	0.0888	6.65E-08	0.0000	0.0000	6.55E-08
180	0.00	0.000	0.005	0.0133	0.4767	0.0810	6.06E-08	0.0000	0.0000	5.97E-08
181	0.00	0.000	0.002	0.0130	0.5346	0.0908	6.80E-08	0.0000	0.0000	6.70E-08
182	0.00	0.000	0.000	0.0130	0.6100	0.1037	7.78E-08	0.0000	0.0000	7.65E-08
183	0.00	0.000	0.000	0.0130	0.6128	0.1041	7.81E-08	0.0000	0.0000	7.69E-08
184	1.40	0.000	0.060	0.2295	0.5412	0.0920	6.89E-08	0.0000	0.0000	6.79E-08
185	0.00	0.000	0.116	0.0200	0.4091	0.0695	5.19E-08	0.0000	0.0000	5.12E-08
186	0.00	0.000	0.042	0.0130	0.3078	0.0523	3.89E-08	0.0000	0.0000	3.85E-08
187	0.00	0.000	0.000	0.0130	0.3081	0.0524	3.90E-08	0.0000	0.0000	3.85E-08
188	0.00	0.000	0.000	0.0130	0.4719	0.0802	6.00E-08	0.0000	0.0000	5.91E-08
189	0.98	0.000	0.191	0.1445	0.5548	0.0943	7.06E-08	0.0000	0.0000	6.96E-08
190	0.02	0.000	0.135	0.0633	0.4910	0.0834	6.24E-08	0.0000	0.0000	6.15E-08
191	0.00	0.000	0.101	0.0138	0.3791	0.0644	4.80E-08	0.0000	0.0000	4.74E-08
192	0.00	0.000	0.004	0.0132	0.3673	0.0624	4.65E-08	0.0000	0.0000	4.60E-08
193	0.00	0.000	0.001	0.0130	0.5578	0.0948	7.10E-08	0.0000	0.0000	7.00E-08
194	0.00	0.000	0.000	0.0130	0.6749	0.1147	8.62E-08	0.0000	0.0000	8.48E-08
195	0.00	0.000	0.000	0.0130	0.6363	0.1081	8.12E-08	0.0000	0.0000	7.99E-08
196	0.00	0.000	0.000	0.0130	0.4899	0.0832	6.23E-08	0.0000	0.0000	6.14E-08

197	0.00	0.000	0.000	0.0130	0.4197	0.0713	5.33E-08	0.0000	0.0000	5.26E-08
198	0.00	0.000	0.000	0.0130	0.4917	0.0836	6.25E-08	0.0000	0.0000	6.16E-08
199	0.00	0.000	0.000	0.0130	0.5899	0.1002	7.52E-08	0.0000	0.0000	7.40E-08
200	0.00	0.000	0.000	0.0130	0.6601	0.1122	8.43E-08	0.0000	0.0000	8.29E-08
201	0.00	0.000	0.000	0.0130	0.7012	0.1192	8.96E-08	0.0000	0.0000	8.81E-08
202	1.92	0.000	0.040	0.1697	0.7215	0.1226	9.23E-08	0.0000	0.0000	9.07E-08
203	0.53	0.000	0.057	0.0973	0.7303	0.1241	9.34E-08	0.0000	0.0000	9.18E-08
204	0.00	0.000	0.115	0.0358	0.7086	0.1204	9.06E-08	0.0000	0.0000	8.90E-08
205	0.00	0.000	0.052	0.0266	0.7789	0.1324	9.97E-08	0.0000	0.0000	9.79E-08
206	0.33	0.000	0.150	0.0543	0.7675	0.1304	9.83E-08	0.0000	0.0000	9.65E-08
207	0.05	0.000	0.103	0.0426	0.6588	0.1119	8.41E-08	0.0000	0.0000	8.27E-08
208	0.00	0.000	0.150	0.0138	0.5807	0.0987	7.40E-08	0.0000	0.0000	7.28E-08
209	0.39	0.000	0.029	0.0741	0.4341	0.0738	5.51E-08	0.0000	0.0000	5.44E-08
210	0.02	0.000	0.056	0.0405	0.4214	0.0716	5.35E-08	0.0000	0.0000	5.28E-08
211	0.00	0.000	0.133	0.0171	0.5827	0.0990	7.42E-08	0.0000	0.0000	7.31E-08
212	0.00	0.000	0.025	0.0130	0.6793	0.1154	8.68E-08	0.0000	0.0000	8.53E-08
213	1.98	0.000	0.195	0.1739	0.7876	0.1338	1.01E-07	0.0000	0.0000	9.91E-08
214	0.00	0.000	0.085	0.0180	0.7800	0.1325	9.99E-08	0.0000	0.0000	9.81E-08
215	0.00	0.000	0.030	0.0130	0.7160	0.1217	9.15E-08	0.0000	0.0000	9.00E-08
216	0.18	0.000	0.085	0.0288	0.7721	0.1312	9.88E-08	0.0000	0.0000	9.71E-08
217	0.00	0.000	0.073	0.0165	0.8187	0.1391	1.05E-07	0.0000	0.0000	1.03E-07
218	0.00	0.000	0.017	0.0137	0.6773	0.1151	8.65E-08	0.0000	0.0000	8.51E-08
219	0.00	0.000	0.003	0.0132	0.4813	0.0818	6.12E-08	0.0000	0.0000	6.03E-08
220	0.00	0.000	0.000	0.0130	0.6485	0.1102	8.28E-08	0.0000	0.0000	8.14E-08
221	0.00	0.000	0.000	0.0130	0.8449	0.1436	1.08E-07	0.0000	0.0000	1.06E-07
222	0.00	0.000	0.000	0.0130	0.9605	0.1632	1.24E-07	0.0000	0.0000	1.21E-07
223	0.00	0.000	0.000	0.0130	1.0172	0.1728	1.31E-07	0.0000	0.0000	1.28E-07
224	0.04	0.000	0.019	0.0165	1.0369	0.1762	1.34E-07	0.0000	0.0000	1.31E-07
225	0.03	0.000	0.024	0.0175	1.0340	0.1757	1.33E-07	0.0000	0.0000	1.30E-07
226	0.00	0.000	0.015	0.0151	1.0178	0.1729	1.31E-07	0.0000	0.0000	1.28E-07
227	0.01	0.000	0.018	0.0137	0.9938	0.1689	1.28E-07	0.0000	0.0000	1.25E-07
228	0.40	0.000	0.036	0.0743	0.9659	0.1641	1.24E-07	0.0000	0.0000	1.22E-07
229	1.05	0.000	0.080	0.2058	0.9361	0.1591	1.20E-07	0.0000	0.0000	1.18E-07
230	0.00	0.000	0.115	0.0340	0.9095	0.1545	1.17E-07	0.0000	0.0000	1.15E-07

231	0.00	0.000	0.050	0.0256	0.8620	0.1465	1.11E-07	0.0000	0.0000	1.09E-07
232	0.00	0.000	0.066	0.0130	0.8731	0.1484	1.12E-07	0.0000	0.0000	1.10E-07
233	0.72	0.000	0.036	0.1271	0.8855	0.1505	1.14E-07	0.0000	0.0000	1.11E-07
234	0.45	0.000	0.141	0.1225	0.8339	0.1417	1.07E-07	0.0000	0.0000	1.05E-07
235	0.01	0.000	0.125	0.0352	0.7022	0.1193	8.97E-08	0.0000	0.0000	8.82E-08
236	0.00	0.000	0.116	0.0149	0.5188	0.0882	6.60E-08	0.0000	0.0000	6.50E-08
237	0.00	0.000	0.011	0.0130	0.4152	0.0706	5.27E-08	0.0000	0.0000	5.20E-08
238	0.00	0.000	0.000	0.0130	0.5243	0.0891	6.67E-08	0.0000	0.0000	6.57E-08
239	0.00	0.000	0.000	0.0130	0.5968	0.1014	7.61E-08	0.0000	0.0000	7.49E-08
240	0.00	0.000	0.000	0.0130	0.4950	0.0841	6.29E-08	0.0000	0.0000	6.20E-08
241	0.00	0.000	0.000	0.0130	0.3449	0.0586	4.37E-08	0.0000	0.0000	4.32E-08
242	0.00	0.000	0.000	0.0130	0.4205	0.0714	5.34E-08	0.0000	0.0000	5.27E-08
243	0.00	0.000	0.000	0.0130	0.5771	0.0981	7.35E-08	0.0000	0.0000	7.24E-08
244	0.00	0.000	0.000	0.0130	0.6907	0.1174	8.82E-08	0.0000	0.0000	8.68E-08
245	0.50	0.000	0.031	0.0912	0.7570	0.1286	9.69E-08	0.0000	0.0000	9.52E-08
246	0.81	0.000	0.094	0.1721	0.7906	0.1343	1.01E-07	0.0000	0.0000	9.94E-08
247	0.00	0.000	0.086	0.0624	0.8010	0.1361	1.03E-07	0.0000	0.0000	1.01E-07
248	0.07	0.000	0.119	0.0252	0.7948	0.1351	1.02E-07	0.0000	0.0000	1.00E-07
249	0.56	0.000	0.047	0.1104	0.8050	0.1368	1.03E-07	0.0000	0.0000	1.01E-07
250	0.06	0.000	0.140	0.0475	0.8396	0.1427	1.08E-07	0.0000	0.0000	1.06E-07
251	0.00	0.000	0.080	0.0239	0.8248	0.1401	1.06E-07	0.0000	0.0000	1.04E-07
252	0.00	0.000	0.041	0.0148	0.7323	0.1244	9.37E-08	0.0000	0.0000	9.20E-08
253	1.10	0.000	0.040	0.1910	0.5263	0.0894	6.70E-08	0.0000	0.0000	6.60E-08
254	0.06	0.000	0.081	0.0311	0.4645	0.0789	5.90E-08	0.0000	0.0000	5.82E-08
255	0.00	0.000	0.088	0.0157	0.4718	0.0802	5.99E-08	0.0000	0.0000	5.91E-08
256	0.00	0.000	0.013	0.0132	0.3428	0.0583	4.34E-08	0.0000	0.0000	4.29E-08
257	0.02	0.000	0.019	0.0133	0.4295	0.0730	5.45E-08	0.0000	0.0000	5.38E-08
258	0.02	0.000	0.012	0.0146	0.5254	0.0893	6.68E-08	0.0000	0.0000	6.59E-08
259	0.00	0.000	0.008	0.0133	0.4102	0.0697	5.20E-08	0.0000	0.0000	5.14E-08
260	0.00	0.000	0.001	0.0131	0.3792	0.0644	4.81E-08	0.0000	0.0000	4.75E-08
261	0.00	0.000	0.000	0.0130	0.5443	0.0925	6.93E-08	0.0000	0.0000	6.83E-08
262	1.17	0.000	0.037	0.2018	0.6982	0.1186	8.92E-08	0.0000	0.0000	8.77E-08
263	0.05	0.000	0.086	0.0223	0.7919	0.1346	1.01E-07	0.0000	0.0000	9.96E-08
264	0.48	0.000	0.085	0.0882	0.8384	0.1425	1.07E-07	0.0000	0.0000	1.05E-07

265		0.00	0.000	0.038	0.0443	0.8973	0.1525	1.15E-07	0.0000	0.0000	1.13E-07
266		0.17	0.000	0.023	0.0618	0.9555	0.1624	1.23E-07	0.0000	0.0000	1.20E-07
267		0.77	0.000	0.059	0.1606	0.8533	0.1450	1.09E-07	0.0000	0.0000	1.07E-07
268		0.00	0.000	0.029	0.0737	0.6775	0.1151	8.65E-08	0.0000	0.0000	8.51E-08
269		0.64	0.000	0.069	0.1333	0.6099	0.1036	7.78E-08	0.0000	0.0000	7.65E-08
270	*	0.10	0.000	0.047	0.0663	0.4744	0.0806	6.03E-08	0.0000	0.0000	5.94E-08
271		0.00	0.000	0.070	0.0260	0.6084	0.1034	7.76E-08	0.0000	0.0000	7.63E-08
272		0.00	0.000	0.061	0.0158	0.5813	0.0988	7.41E-08	0.0000	0.0000	7.29E-08
273		0.06	0.000	0.028	0.0207	0.5065	0.0861	6.44E-08	0.0000	0.0000	6.35E-08
274		0.60	0.000	0.059	0.1108	0.5806	0.0987	7.40E-08	0.0000	0.0000	7.28E-08
275		0.00	0.000	0.047	0.0535	0.4619	0.0785	5.87E-08	0.0000	0.0000	5.79E-08
276	*	0.00	0.000	0.047	0.0264	0.4231	0.0719	5.37E-08	0.0000	0.0000	5.30E-08
277		0.54	0.000	0.028	0.1108	0.7357	0.1250	9.41E-08	0.0000	0.0000	9.26E-08
278		1.92	0.000	0.033	0.2206	0.9805	0.1666	1.26E-07	0.0000	0.0000	1.24E-07
279		0.70	0.000	0.053	0.1647	0.9123	0.1550	1.17E-07	0.0000	0.0000	1.15E-07
280	*	0.92	0.000	0.009	0.0718	0.7579	0.1288	9.70E-08	0.0000	0.0000	9.53E-08
281		0.06	0.000	0.000	0.1304	0.8212	0.1395	1.05E-07	0.0000	0.0000	1.03E-07
282		0.01	0.000	0.000	0.1247	0.7034	0.1195	8.99E-08	0.0000	0.0000	8.84E-08
283		0.00	0.000	0.034	0.0395	0.7041	0.1196	9.00E-08	0.0000	0.0000	8.85E-08
284		0.00	0.000	0.054	0.0301	0.6137	0.1043	7.83E-08	0.0000	0.0000	7.70E-08
285		0.01	0.000	0.047	0.0213	0.7394	0.1256	9.46E-08	0.0000	0.0000	9.29E-08
286	*	0.31	0.000	0.009	0.0238	0.7868	0.1337	1.01E-07	0.0000	0.0000	9.90E-08
287	*	0.00	0.000	0.009	0.0266	1.3688	0.2326	1.78E-07	0.0000	0.0000	1.74E-07
288		0.00	0.000	0.003	0.0679	1.7369	0.2951	2.27E-07	0.0000	0.0000	2.21E-07
289	*	0.00	0.000	0.000	0.0468	1.9088	0.3243	2.51E-07	0.0000	0.0000	2.44E-07
290	*	0.00	0.000	0.012	0.0394	1.9604	0.3331	2.58E-07	0.0000	0.0000	2.51E-07
291		0.00	0.000	0.028	0.0328	1.9683	0.3345	2.59E-07	0.0000	0.0000	2.52E-07
292		0.42	0.000	0.023	0.0980	1.8535	0.3150	2.43E-07	0.0000	0.0000	2.37E-07
293	*	0.30	0.000	0.009	0.0500	1.7178	0.2919	2.25E-07	0.0000	0.0000	2.19E-07
294	*	0.04	0.000	0.009	0.0427	1.6104	0.2736	2.10E-07	0.0000	0.0000	2.05E-07
295	*	0.31	0.000	0.009	0.0451	1.6246	0.2761	2.12E-07	0.0000	0.0000	2.07E-07
296	*	0.04	0.000	0.009	0.0477	1.5241	0.2590	1.99E-07	0.0000	0.0000	1.94E-07
297	*	0.00	0.000	0.007	0.0505	1.1843	0.2012	1.53E-07	0.0000	0.0000	1.50E-07
298		0.00	0.000	0.000	0.0533	1.0020	0.1703	1.29E-07	0.0000	0.0000	1.26E-07

299			0.05	0.000	0.000	0.0628	1.0642	0.1808	1.37E-07	0.0000	0.0000	1.34E-07
300	*		0.00	0.000	0.010	0.0589	1.1314	0.1922	1.46E-07	0.0000	0.0000	1.43E-07
301	*		0.00	0.000	0.009	0.0597	1.1580	0.1968	1.50E-07	0.0000	0.0000	1.46E-07
302			0.00	0.000	0.000	0.0705	1.1846	0.2013	1.53E-07	0.0000	0.0000	1.50E-07
303			0.06	0.000	0.000	0.0758	1.1783	0.2002	1.52E-07	0.0000	0.0000	1.49E-07
304	*		0.05	0.000	0.009	0.0558	1.1137	0.1893	1.44E-07	0.0000	0.0000	1.41E-07
305	*		0.02	0.000	0.014	0.0564	1.1102	0.1887	1.43E-07	0.0000	0.0000	1.40E-07
306	*		0.00	0.000	0.014	0.0573	1.1052	0.1878	1.43E-07	0.0000	0.0000	1.40E-07
307	*	*	0.00	0.000	0.014	0.0573	1.0352	0.1759	1.33E-07	0.0000	0.0000	1.31E-07
308	*	*	0.00	0.000	0.014	0.0573	0.8556	0.1454	1.10E-07	0.0000	0.0000	1.08E-07
309	*	*	0.00	0.000	0.014	0.0573	0.6123	0.1040	7.81E-08	0.0000	0.0000	7.68E-08
310	*	*	0.00	0.000	0.014	0.0573	0.5168	0.0878	6.57E-08	0.0000	0.0000	6.48E-08
311	*	*	0.00	0.000	0.013	0.0573	0.5906	0.1004	7.53E-08	0.0000	0.0000	7.41E-08
312	*	*	0.00	0.000	0.013	0.0573	0.6883	0.1170	8.79E-08	0.0000	0.0000	8.65E-08
313		*	0.00	0.000	0.011	0.0585	0.7567	0.1286	9.68E-08	0.0000	0.0000	9.51E-08
314		*	0.26	0.000	0.006	0.1008	0.7955	0.1352	1.02E-07	0.0000	0.0000	1.00E-07
315	*	*	0.12	0.000	0.009	0.1008	0.8129	0.1381	1.04E-07	0.0000	0.0000	1.02E-07
316	*	*	0.00	0.000	0.008	0.1008	0.8158	0.1386	1.05E-07	0.0000	0.0000	1.03E-07
317	*	*	0.02	0.000	0.006	0.1008	0.8093	0.1375	1.04E-07	0.0000	0.0000	1.02E-07
318	*	*	0.06	0.000	0.008	0.1008	0.7969	0.1354	1.02E-07	0.0000	0.0000	1.00E-07
319	*	*	0.05	0.000	0.007	0.1008	0.7809	0.1327	1.00E-07	0.0000	0.0000	9.82E-08
320	*	*	0.00	0.000	0.007	0.1008	0.7629	0.1296	9.76E-08	0.0000	0.0000	9.59E-08
321	*	*	0.00	0.000	0.007	0.1008	0.7440	0.1264	9.52E-08	0.0000	0.0000	9.35E-08
322	*	*	0.00	0.000	0.008	0.1008	0.7246	0.1231	9.27E-08	0.0000	0.0000	9.11E-08
323		*	0.00	0.000	0.010	0.1008	0.7054	0.1199	9.01E-08	0.0000	0.0000	8.86E-08
324	*	*	0.00	0.000	0.009	0.1008	0.6864	0.1166	8.77E-08	0.0000	0.0000	8.62E-08
325	*	*	0.07	0.000	0.009	0.1008	0.6680	0.1135	8.53E-08	0.0000	0.0000	8.39E-08
326	*	*	0.18	0.000	0.008	0.1008	0.6501	0.1105	8.30E-08	0.0000	0.0000	8.16E-08
327	*	*	0.03	0.000	0.000	0.1008	0.6328	0.1075	8.07E-08	0.0000	0.0000	7.94E-08
328	*	*	0.01	0.000	0.007	0.1008	0.6162	0.1047	7.86E-08	0.0000	0.0000	7.73E-08
329	*	*	0.27	0.000	0.006	0.1008	0.6003	0.1020	7.65E-08	0.0000	0.0000	7.53E-08
330	*	*	0.04	0.000	0.006	0.1008	0.5850	0.0994	7.45E-08	0.0000	0.0000	7.34E-08
331	*	*	0.11	0.000	0.005	0.1008	0.5703	0.0969	7.26E-08	0.0000	0.0000	7.15E-08
332	*	*	0.00	0.000	0.006	0.1008	0.5562	0.0945	7.08E-08	0.0000	0.0000	6.97E-08

333		*	0.00	0.000	0.010	0.1028	0.5427	0.0922	6.91E-08	0.0000	0.0000	6.80E-08
334	*	*	0.33	0.000	0.006	0.1029	0.5297	0.0900	6.74E-08	0.0000	0.0000	6.64E-08
335	*	*	0.16	0.000	0.006	0.1029	0.5173	0.0879	6.58E-08	0.0000	0.0000	6.48E-08
336	*	*	0.17	0.000	0.005	0.1029	0.5053	0.0859	6.43E-08	0.0000	0.0000	6.33E-08
337	*	*	0.13	0.000	0.003	0.1029	0.4939	0.0839	6.28E-08	0.0000	0.0000	6.19E-08
338	*	*	0.00	0.000	0.004	0.1029	0.4828	0.0820	6.14E-08	0.0000	0.0000	6.05E-08
339	*	*	0.00	0.000	0.004	0.1029	0.4722	0.0802	6.00E-08	0.0000	0.0000	5.92E-08
340	*	*	0.01	0.000	0.000	0.1029	0.4620	0.0785	5.87E-08	0.0000	0.0000	5.79E-08
341	*	*	0.00	0.000	0.000	0.1029	0.4522	0.0768	5.74E-08	0.0000	0.0000	5.66E-08
342	*	*	0.02	0.000	0.005	0.1029	0.4428	0.0752	5.62E-08	0.0000	0.0000	5.55E-08
343	*	*	0.01	0.000	0.000	0.1029	0.4337	0.0737	5.50E-08	0.0000	0.0000	5.43E-08
344	*	*	0.00	0.000	0.000	0.1029	0.4249	0.0722	5.39E-08	0.0000	0.0000	5.32E-08
345	*	*	0.00	0.000	0.000	0.1029	0.4164	0.0708	5.28E-08	0.0000	0.0000	5.21E-08
346		*	0.00	0.000	0.000	0.1029	0.4083	0.0694	5.18E-08	0.0000	0.0000	5.11E-08
347	*	*	0.00	0.000	0.000	0.1029	0.4004	0.0680	5.08E-08	0.0000	0.0000	5.01E-08
348	*	*	0.00	0.000	0.009	0.1029	0.3928	0.0667	4.98E-08	0.0000	0.0000	4.92E-08
349	*	*	0.01	0.000	0.000	0.1029	0.3855	0.0655	4.89E-08	0.0000	0.0000	4.82E-08
350	*	*	0.00	0.000	0.006	0.1029	0.3784	0.0643	4.80E-08	0.0000	0.0000	4.74E-08
351	*	*	0.04	0.000	0.000	0.1029	0.3715	0.0631	4.71E-08	0.0000	0.0000	4.65E-08
352		*	0.04	0.000	0.000	0.1029	0.3648	0.0620	4.62E-08	0.0000	0.0000	4.57E-08
353		*	0.02	0.000	0.000	0.1073	0.3584	0.0609	4.54E-08	0.0000	0.0000	4.48E-08
354	*	*	0.03	0.000	0.008	0.1079	0.3522	0.0598	4.46E-08	0.0000	0.0000	4.41E-08
355	*	*	0.06	0.000	0.007	0.1079	0.3461	0.0588	4.38E-08	0.0000	0.0000	4.33E-08
356	*	*	0.00	0.000	0.006	0.1079	0.3403	0.0578	4.31E-08	0.0000	0.0000	4.26E-08
357	*	*	0.02	0.000	0.005	0.1079	0.3346	0.0569	4.24E-08	0.0000	0.0000	4.19E-08
358	*	*	0.03	0.000	0.006	0.1079	0.3291	0.0559	4.17E-08	0.0000	0.0000	4.12E-08
359	*	*	0.00	0.000	0.007	0.1079	0.3238	0.0550	4.10E-08	0.0000	0.0000	4.05E-08
360	*	*	0.01	0.000	0.005	0.1079	0.3186	0.0541	4.03E-08	0.0000	0.0000	3.98E-08
361	*	*	0.00	0.000	0.007	0.1079	0.3136	0.0533	3.97E-08	0.0000	0.0000	3.92E-08
362	*	*	0.00	0.000	0.000	0.1079	0.3087	0.0525	3.90E-08	0.0000	0.0000	3.86E-08
363	*	*	0.00	0.000	0.006	0.1079	0.3039	0.0516	3.84E-08	0.0000	0.0000	3.80E-08
364		*	0.00	0.000	0.000	0.1079	0.2993	0.0509	3.79E-08	0.0000	0.0000	3.74E-08
365	*	*	0.00	0.000	0.005	0.1079	0.2948	0.0501	3.73E-08	0.0000	0.0000	3.69E-08

* = Frozen (air or soil)

Annual Totals for Year 3			
	inches	cubic feet	percent
Precipitation	46.22	1,258,339.5	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	8.168	222,386.9	17.67
Drainage Collected from Layer 3	40.2545	1,095,929.3	87.09
Percolation/Leakage through Layer 5	0.000030	0.8298	0.00
Average Head on Top of Layer 4	0.6490	---	---
Drainage Collected from Layer 6	0.0000	0.0162	0.00
Percolation/Leakage through Layer 7	0.000030	0.8136	0.00
Average Head on Top of Layer 7	0.0000	---	---
Change in Water Storage	-2.2030	-59,977.6	-4.77
Soil Water at Start of Year	29.4934	802,957.9	63.81
Soil Water at End of Year	27.9130	759,931.1	60.39
Snow Water at Start of Year	2.3852	64,935.9	5.16
Snow Water at End of Year	1.7625	47,985.0	3.81
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 4

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 7 | Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 6 | Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 7

Title: WPC-Ore Pad Liner

Simulated On: 4/1/2026 23:24

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1	*	*	0.01	0.000	0.005	0.1079	0.2904	0.0494	3.67E-08	0.0000	0.0000	3.63E-08
2	*	*	0.01	0.000	0.005	0.1079	0.2862	0.0486	3.62E-08	0.0000	0.0000	3.58E-08
3	*	*	0.00	0.000	0.003	0.1079	0.2820	0.0479	3.57E-08	0.0000	0.0000	3.53E-08
4	*	*	0.00	0.000	0.000	0.1079	0.2780	0.0472	3.51E-08	0.0000	0.0000	3.48E-08
5	*	*	0.01	0.000	0.000	0.1079	0.2741	0.0466	3.46E-08	0.0000	0.0000	3.43E-08
6	*	*	0.02	0.000	0.000	0.1079	0.2703	0.0459	3.42E-08	0.0000	0.0000	3.38E-08
7	*	*	0.00	0.000	0.000	0.1079	0.2665	0.0453	3.37E-08	0.0000	0.0000	3.33E-08
8	*	*	0.00	0.000	0.000	0.1079	0.2629	0.0447	3.32E-08	0.0000	0.0000	3.29E-08
9	*	*	0.19	0.000	0.000	0.1079	0.2593	0.0441	3.28E-08	0.0000	0.0000	3.24E-08
10	*	*	0.16	0.000	0.004	0.1079	0.2559	0.0435	3.23E-08	0.0000	0.0000	3.20E-08
11	*	*	0.04	0.000	0.003	0.1079	0.2525	0.0429	3.19E-08	0.0000	0.0000	3.16E-08
12	*	*	0.13	0.000	0.003	0.1079	0.2492	0.0423	3.15E-08	0.0000	0.0000	3.12E-08
13	*	*	0.01	0.000	0.003	0.1079	0.2460	0.0418	3.11E-08	0.0000	0.0000	3.08E-08
14	*	*	0.02	0.000	0.003	0.1079	0.2429	0.0413	3.07E-08	0.0000	0.0000	3.04E-08
15	*	*	0.01	0.000	0.003	0.1079	0.2398	0.0407	3.03E-08	0.0000	0.0000	3.00E-08
16	*	*	0.00	0.000	0.000	0.1079	0.2368	0.0402	2.99E-08	0.0000	0.0000	2.96E-08
17	*	*	0.05	0.000	0.003	0.1079	0.2339	0.0397	2.95E-08	0.0000	0.0000	2.92E-08
18	*	*	0.15	0.000	0.000	0.1079	0.2310	0.0393	2.92E-08	0.0000	0.0000	2.89E-08
19	*	*	0.28	0.000	0.003	0.1079	0.2282	0.0388	2.88E-08	0.0000	0.0000	2.85E-08
20	*	*	0.07	0.000	0.003	0.1079	0.2255	0.0383	2.85E-08	0.0000	0.0000	2.82E-08
21	*	*	0.02	0.000	0.002	0.1079	0.2228	0.0379	2.81E-08	0.0000	0.0000	2.78E-08
22	*	*	0.02	0.000	0.003	0.1079	0.2202	0.0374	2.78E-08	0.0000	0.0000	2.75E-08
23	*	*	0.03	0.000	0.002	0.1079	0.2176	0.0370	2.75E-08	0.0000	0.0000	2.72E-08
24	*	*	0.00	0.000	0.002	0.1079	0.2151	0.0365	2.71E-08	0.0000	0.0000	2.69E-08
25	*	*	0.05	0.000	0.000	0.1079	0.2126	0.0361	2.68E-08	0.0000	0.0000	2.66E-08
26	*	*	0.06	0.000	0.002	0.1079	0.2102	0.0357	2.65E-08	0.0000	0.0000	2.63E-08

27	*	*	0.00	0.000	0.003	0.1079	0.2079	0.0353	2.62E-08	0.0000	0.0000	2.60E-08
28	*	*	0.05	0.000	0.000	0.1079	0.2056	0.0349	2.59E-08	0.0000	0.0000	2.57E-08
29	*	*	0.07	0.000	0.000	0.1079	0.2033	0.0345	2.56E-08	0.0000	0.0000	2.54E-08
30	*	*	0.00	0.000	0.000	0.1079	0.2011	0.0342	2.54E-08	0.0000	0.0000	2.51E-08
31	*	*	0.00	0.000	0.000	0.1079	0.1989	0.0338	2.51E-08	0.0000	0.0000	2.49E-08
32	*	*	0.00	0.000	0.000	0.1079	0.1968	0.0334	2.48E-08	0.0000	0.0000	2.46E-08
33	*	*	0.01	0.000	0.000	0.1079	0.1947	0.0331	2.46E-08	0.0000	0.0000	2.43E-08
34	*	*	0.28	0.000	0.000	0.1079	0.1927	0.0327	2.43E-08	0.0000	0.0000	2.41E-08
35	*	*	0.65	0.000	0.003	0.1079	0.1907	0.0324	2.40E-08	0.0000	0.0000	2.38E-08
36	*	*	0.21	0.000	0.002	0.1079	0.1887	0.0321	2.38E-08	0.0000	0.0000	2.36E-08
37	*	*	0.03	0.000	0.004	0.1079	0.1868	0.0317	2.35E-08	0.0000	0.0000	2.33E-08
38	*	*	0.06	0.000	0.001	0.1079	0.1849	0.0314	2.33E-08	0.0000	0.0000	2.31E-08
39	*	*	0.17	0.000	0.000	0.1079	0.1830	0.0311	2.31E-08	0.0000	0.0000	2.29E-08
40	*	*	0.03	0.000	0.002	0.1079	0.1812	0.0308	2.28E-08	0.0000	0.0000	2.26E-08
41	*	*	0.05	0.000	0.003	0.1079	0.1794	0.0305	2.26E-08	0.0000	0.0000	2.24E-08
42	*	*	0.01	0.000	0.003	0.1079	0.1776	0.0302	2.24E-08	0.0000	0.0000	2.22E-08
43	*	*	0.03	0.000	0.002	0.1079	0.1759	0.0299	2.22E-08	0.0000	0.0000	2.20E-08
44	*	*	0.00	0.000	0.003	0.1079	0.1742	0.0296	2.20E-08	0.0000	0.0000	2.18E-08
45	*	*	0.00	0.000	0.000	0.1079	0.1725	0.0293	2.17E-08	0.0000	0.0000	2.16E-08
46	*	*	0.00	0.000	0.001	0.1079	0.1709	0.0290	2.15E-08	0.0000	0.0000	2.14E-08
47	*	*	0.00	0.000	0.002	0.1079	0.1693	0.0288	2.13E-08	0.0000	0.0000	2.12E-08
48	*	*	0.00	0.000	0.000	0.1079	0.1677	0.0285	2.11E-08	0.0000	0.0000	2.10E-08
49	*	*	0.00	0.000	0.000	0.1079	0.1662	0.0282	2.09E-08	0.0000	0.0000	2.08E-08
50	*	*	0.01	0.000	0.000	0.1079	0.1646	0.0280	2.07E-08	0.0000	0.0000	2.06E-08
51	*	*	0.00	0.000	0.000	0.1079	0.1631	0.0277	2.05E-08	0.0000	0.0000	2.04E-08
52	*	*	0.00	0.000	0.006	0.1079	0.1616	0.0275	2.04E-08	0.0000	0.0000	2.02E-08
53	*	*	0.04	0.000	0.004	0.1079	0.1602	0.0272	2.02E-08	0.0000	0.0000	2.00E-08
54	*	*	0.01	0.000	0.003	0.1079	0.1588	0.0270	2.00E-08	0.0000	0.0000	1.98E-08
55	*	*	0.01	0.000	0.003	0.1079	0.1574	0.0267	1.98E-08	0.0000	0.0000	1.97E-08
56	*	*	0.00	0.000	0.001	0.1079	0.1560	0.0265	1.96E-08	0.0000	0.0000	1.95E-08
57	*	*	0.00	0.000	0.003	0.1079	0.1546	0.0263	1.95E-08	0.0000	0.0000	1.93E-08
58	*	*	0.00	0.000	0.000	0.1079	0.1533	0.0260	1.93E-08	0.0000	0.0000	1.91E-08
59	*	*	0.00	0.000	0.000	0.1079	0.1520	0.0258	1.91E-08	0.0000	0.0000	1.90E-08
60	*	*	0.00	0.000	0.005	0.1079	0.1507	0.0256	1.90E-08	0.0000	0.0000	1.88E-08

61	*	*	0.23	0.000	0.002	0.1079	0.1494	0.0254	1.88E-08	0.0000	0.0000	1.87E-08
62	*	*	0.00	0.000	0.001	0.1079	0.1481	0.0252	1.87E-08	0.0000	0.0000	1.85E-08
63	*	*	0.10	0.000	0.000	0.1079	0.1469	0.0250	1.85E-08	0.0000	0.0000	1.84E-08
64	*	*	0.00	0.000	0.002	0.1079	0.1457	0.0248	1.83E-08	0.0000	0.0000	1.82E-08
65	*	*	0.00	0.000	0.002	0.1079	0.1445	0.0245	1.82E-08	0.0000	0.0000	1.80E-08
66	*	*	0.08	0.000	0.000	0.1079	0.1433	0.0243	1.80E-08	0.0000	0.0000	1.79E-08
67	*	*	0.05	0.000	0.000	0.1079	0.1421	0.0242	1.79E-08	0.0000	0.0000	1.78E-08
68	*	*	0.00	0.000	0.002	0.1079	0.1410	0.0240	1.77E-08	0.0000	0.0000	1.76E-08
69	*	*	0.00	0.000	0.003	0.1079	0.1399	0.0238	1.76E-08	0.0000	0.0000	1.75E-08
70	*	*	0.02	0.000	0.000	0.1079	0.1387	0.0236	1.75E-08	0.0000	0.0000	1.73E-08
71	*	*	0.00	0.000	0.000	0.1079	0.1376	0.0234	1.73E-08	0.0000	0.0000	1.72E-08
72	*	*	0.00	0.000	0.003	0.1079	0.1366	0.0232	1.72E-08	0.0000	0.0000	1.71E-08
73		*	0.00	0.000	0.000	0.1079	0.1355	0.0230	1.71E-08	0.0000	0.0000	1.69E-08
74	*	*	0.00	0.000	0.000	0.1079	0.1344	0.0228	1.69E-08	0.0000	0.0000	1.68E-08
75		*	0.00	0.000	0.000	0.1992	0.1334	0.0227	1.68E-08	0.0000	0.0000	1.67E-08
76		*	0.00	0.000	0.000	0.2298	0.1324	0.0225	1.67E-08	0.0000	0.0000	1.65E-08
77		*	0.00	0.000	0.006	0.2362	0.1314	0.0223	1.65E-08	0.0000	0.0000	1.64E-08
78	*	*	0.00	0.000	0.010	0.2362	0.1304	0.0222	1.64E-08	0.0000	0.0000	1.63E-08
79		*	0.03	0.000	0.000	0.2381	0.1294	0.0220	1.63E-08	0.0000	0.0000	1.62E-08
80	*	*	0.20	0.000	0.010	0.2381	0.1285	0.0218	1.62E-08	0.0000	0.0000	1.60E-08
81		*	0.46	0.000	0.000	0.2978	0.1275	0.0217	1.60E-08	0.0000	0.0000	1.59E-08
82		*	0.00	0.000	0.000	0.3408	0.1266	0.0215	1.59E-08	0.0000	0.0000	1.58E-08
83		*	0.00	0.000	0.000	0.3970	0.1257	0.0214	1.58E-08	0.0000	0.0000	1.57E-08
84		*	0.00	0.000	0.000	0.3970	0.1187	0.0202	1.49E-08	0.0000	0.0000	1.48E-08
85	*	*	0.00	0.000	0.004	0.3970	0.1296	0.0220	1.63E-08	0.0000	0.0000	1.62E-08
86	*	*	0.00	0.000	0.009	0.3970	0.1360	0.0231	1.71E-08	0.0000	0.0000	1.70E-08
87	*	*	0.79	0.000	0.015	0.3970	0.1260	0.0214	1.59E-08	0.0000	0.0000	1.57E-08
88	*	*	0.91	0.000	0.010	0.3970	0.1122	0.0191	1.41E-08	0.0000	0.0000	1.40E-08
89	*	*	0.00	0.000	0.008	0.3970	0.1047	0.0178	1.32E-08	0.0000	0.0000	1.31E-08
90	*	*	0.03	0.000	0.014	0.3970	0.1067	0.0181	1.34E-08	0.0000	0.0000	1.33E-08
91		*	0.07	0.000	0.000	0.3970	0.1112	0.0189	1.40E-08	0.0000	0.0000	1.39E-08
92	*	*	0.31	0.000	0.002	0.3970	0.1076	0.0183	1.35E-08	0.0000	0.0000	1.34E-08
93	*	*	0.02	0.000	0.017	0.3970	0.1201	0.0204	1.51E-08	0.0000	0.0000	1.50E-08
94	*	*	0.18	0.000	0.015	0.3970	0.1405	0.0239	1.77E-08	0.0000	0.0000	1.75E-08

95	*	*	0.22	0.000	0.015	0.3970	0.1499	0.0255	1.89E-08	0.0000	0.0000	1.87E-08
96	*	*	0.00	0.000	0.009	0.3970	0.1505	0.0256	1.90E-08	0.0000	0.0000	1.88E-08
97	*	*	0.00	0.000	0.013	0.3970	0.1464	0.0249	1.84E-08	0.0000	0.0000	1.83E-08
98	*	*	0.00	0.000	0.006	0.3970	0.1326	0.0225	1.67E-08	0.0000	0.0000	1.66E-08
99	*	*	0.00	0.000	0.000	0.3970	0.1173	0.0199	1.48E-08	0.0000	0.0000	1.47E-08
100		*	0.00	0.000	0.000	0.3970	0.1070	0.0182	1.35E-08	0.0000	0.0000	1.34E-08
101	*	*	0.00	0.000	0.022	0.3970	0.1017	0.0173	1.28E-08	0.0000	0.0000	1.27E-08
102	*	*	0.00	0.000	0.024	0.3970	0.0983	0.0167	1.24E-08	0.0000	0.0000	1.23E-08
103		*	0.00	0.000	0.011	0.3970	0.0989	0.0168	1.24E-08	0.0000	0.0000	1.23E-08
104		*	0.00	0.000	0.000	0.3970	0.0970	0.0165	1.22E-08	0.0000	0.0000	1.21E-08
105		*	0.00	0.000	0.000	0.3970	0.0941	0.0160	1.18E-08	0.0000	0.0000	1.18E-08
106	*	*	0.00	0.000	0.021	0.3970	0.0976	0.0166	1.23E-08	0.0000	0.0000	1.22E-08
107	*	*	0.28	0.000	0.015	0.3970	0.1037	0.0176	1.30E-08	0.0000	0.0000	1.29E-08
108	*	*	0.41	0.000	0.025	0.3970	0.1183	0.0201	1.49E-08	0.0000	0.0000	1.48E-08
109		*	0.01	0.000	0.000	0.3970	0.1142	0.0194	1.44E-08	0.0000	0.0000	1.43E-08
110		*	0.52	0.000	0.000	0.3970	0.0847	0.0144	1.06E-08	0.0000	0.0000	1.06E-08
111		*	1.23	0.000	0.000	0.3970	0.0711	0.0121	8.92E-09	0.0000	0.0000	8.88E-09
112	*	*	0.05	0.000	0.024	0.3970	0.0772	0.0131	9.70E-09	0.0000	0.0000	9.64E-09
113	*	*	0.00	0.000	0.029	0.3970	0.0856	0.0146	1.08E-08	0.0000	0.0000	1.07E-08
114		*	0.00	0.000	0.000	0.3970	0.0827	0.0140	1.04E-08	0.0000	0.0000	1.03E-08
115		*	0.00	0.000	0.000	0.3970	0.0552	0.0094	7.63E-09	0.0000	0.0000	7.60E-09
116	*	*	0.00	0.000	0.030	0.3970	0.0503	0.0085	7.41E-09	0.0000	0.0000	7.38E-09
117		*	0.01	0.000	0.000	0.3970	0.0580	0.0098	7.66E-09	0.0000	0.0000	7.62E-09
118		*	0.00	0.000	0.000	0.3970	0.0507	0.0086	7.42E-09	0.0000	0.0000	7.38E-09
119		*	0.00	0.000	0.000	0.3970	0.0635	0.0108	7.98E-09	0.0000	0.0000	7.94E-09
120		*	0.00	0.000	0.000	0.3970	0.0475	0.0081	7.38E-09	0.0000	0.0000	7.34E-09
121		*	0.00	0.000	0.000	0.3970	0.0480	0.0082	7.39E-09	0.0000	0.0000	7.35E-09
122	*	*	0.00	0.000	0.000	0.3970	0.0673	0.0114	8.45E-09	0.0000	0.0000	8.41E-09
123		*	0.00	0.000	0.000	0.3970	0.0471	0.0080	7.37E-09	0.0000	0.0000	7.34E-09
124		*	0.00	0.000	0.000	0.3970	0.0854	0.0145	1.22E-08	0.0000	0.0000	1.21E-08
125		*	0.00	0.000	0.000	0.3970	0.4125	0.0701	5.24E-08	0.0000	0.0000	5.17E-08
126		*	0.12	0.000	0.001	0.3970	0.6915	0.1175	8.84E-08	0.0000	0.0000	8.69E-08
127		*	0.00	0.000	0.000	0.3970	0.8489	0.1442	1.09E-07	0.0000	0.0000	1.07E-07
128		*	0.03	0.000	0.001	0.3970	0.9372	0.1593	1.20E-07	0.0000	0.0000	1.18E-07

129	*	0.28	0.000	0.001	0.3970	0.9844	0.1673	1.27E-07	0.0000	0.0000	1.24E-07
130	*	0.27	0.000	0.001	0.3970	0.9506	0.1615	1.22E-07	0.0000	0.0000	1.20E-07
131	*	0.62	0.000	0.001	0.3970	0.9422	0.1601	1.21E-07	0.0000	0.0000	1.19E-07
132	*	4.09	0.000	0.001	0.3970	0.9848	0.1673	1.27E-07	0.0000	0.0000	1.24E-07
133	*	0.00	0.000	0.000	0.3970	0.9194	0.1562	1.18E-07	0.0000	0.0000	1.16E-07
134		0.00	0.000	0.044	0.0130	0.7994	0.1358	1.02E-07	0.0000	0.0000	1.01E-07
135		0.00	0.000	0.000	0.0130	0.6731	0.1144	8.60E-08	0.0000	0.0000	8.45E-08
136		0.00	0.000	0.000	0.0130	1.8366	0.3121	2.41E-07	0.0000	0.0000	2.35E-07
137		0.00	0.000	0.000	0.0130	2.6967	0.4582	3.60E-07	0.0000	0.0000	3.48E-07
138		0.00	0.000	0.000	0.0130	3.0535	0.5189	4.11E-07	0.0000	0.0000	3.96E-07
139		0.00	0.000	0.000	0.0130	3.1161	0.5295	4.20E-07	0.0000	0.0000	4.05E-07
140		1.01	0.000	0.032	0.1759	3.0217	0.5135	4.06E-07	0.0000	0.0000	3.92E-07
141		0.01	0.000	0.041	0.0670	2.8547	0.4851	3.83E-07	0.0000	0.0000	3.69E-07
142		0.00	0.000	0.066	0.0163	2.6678	0.4533	3.56E-07	0.0000	0.0000	3.44E-07
143		0.00	0.000	0.019	0.0132	2.4739	0.4204	3.29E-07	0.0000	0.0000	3.18E-07
144		0.00	0.000	0.001	0.0130	1.9726	0.3352	2.60E-07	0.0000	0.0000	2.52E-07
145		0.00	0.000	0.000	0.0130	1.5481	0.2631	2.02E-07	0.0000	0.0000	1.97E-07
146		0.00	0.000	0.000	0.0130	1.6686	0.2835	2.18E-07	0.0000	0.0000	2.12E-07
147		0.00	0.000	0.000	0.0130	1.7399	0.2957	2.28E-07	0.0000	0.0000	2.22E-07
148		0.05	0.000	0.004	0.0206	1.7488	0.2972	2.29E-07	0.0000	0.0000	2.23E-07
149		0.03	0.000	0.016	0.0230	1.7177	0.2919	2.25E-07	0.0000	0.0000	2.19E-07
150		0.08	0.000	0.022	0.0327	1.6632	0.2826	2.17E-07	0.0000	0.0000	2.12E-07
151		0.10	0.000	0.024	0.0454	1.5966	0.2713	2.08E-07	0.0000	0.0000	2.03E-07
152		0.00	0.000	0.024	0.0414	1.5252	0.2592	1.99E-07	0.0000	0.0000	1.94E-07
153		0.00	0.000	0.023	0.0375	1.4533	0.2469	1.89E-07	0.0000	0.0000	1.84E-07
154		0.00	0.000	0.022	0.0339	1.3833	0.2351	1.80E-07	0.0000	0.0000	1.75E-07
155		0.00	0.000	0.022	0.0302	1.3165	0.2237	1.71E-07	0.0000	0.0000	1.67E-07
156		0.00	0.000	0.020	0.0268	1.2539	0.2131	1.62E-07	0.0000	0.0000	1.59E-07
157		0.00	0.000	0.020	0.0236	1.1953	0.2031	1.55E-07	0.0000	0.0000	1.51E-07
158		0.33	0.000	0.020	0.0752	1.1406	0.1938	1.47E-07	0.0000	0.0000	1.44E-07
159		0.02	0.000	0.150	0.0366	1.0900	0.1852	1.41E-07	0.0000	0.0000	1.38E-07
160		0.00	0.000	0.020	0.0327	1.0436	0.1773	1.34E-07	0.0000	0.0000	1.32E-07
161		0.08	0.000	0.021	0.0404	0.9978	0.1696	1.28E-07	0.0000	0.0000	1.26E-07
162		0.57	0.000	0.021	0.1310	0.9628	0.1636	1.24E-07	0.0000	0.0000	1.21E-07

163	0.00	0.000	0.101	0.0477	0.9137	0.1553	1.17E-07	0.0000	0.0000	1.15E-07
164	0.00	0.000	0.091	0.0201	0.8888	0.1510	1.14E-07	0.0000	0.0000	1.12E-07
165	0.00	0.000	0.021	0.0130	0.8211	0.1395	1.05E-07	0.0000	0.0000	1.03E-07
166	0.00	0.000	0.000	0.0130	0.8641	0.1468	1.11E-07	0.0000	0.0000	1.09E-07
167	0.00	0.000	0.000	0.0130	0.8325	0.1415	1.07E-07	0.0000	0.0000	1.05E-07
168	0.00	0.000	0.000	0.0130	0.7523	0.1278	9.63E-08	0.0000	0.0000	9.46E-08
169	0.03	0.000	0.006	0.0169	0.6294	0.1069	8.03E-08	0.0000	0.0000	7.90E-08
170	0.00	0.000	0.016	0.0143	0.4751	0.0807	6.04E-08	0.0000	0.0000	5.95E-08
171	0.00	0.000	0.006	0.0133	0.3864	0.0657	4.90E-08	0.0000	0.0000	4.84E-08
172	0.00	0.000	0.001	0.0130	0.4111	0.0699	5.22E-08	0.0000	0.0000	5.15E-08
173	0.00	0.000	0.000	0.0130	0.4818	0.0819	6.12E-08	0.0000	0.0000	6.04E-08
174	0.08	0.000	0.015	0.0238	0.5421	0.0921	6.90E-08	0.0000	0.0000	6.80E-08
175	0.05	0.000	0.023	0.0284	0.5840	0.0992	7.44E-08	0.0000	0.0000	7.33E-08
176	0.95	0.000	0.027	0.1823	0.6077	0.1033	7.75E-08	0.0000	0.0000	7.62E-08
177	0.17	0.000	0.128	0.0709	0.6157	0.1046	7.85E-08	0.0000	0.0000	7.73E-08
178	0.11	0.000	0.175	0.0302	0.6253	0.1063	7.98E-08	0.0000	0.0000	7.85E-08
179	0.00	0.000	0.047	0.0223	0.5986	0.1017	7.63E-08	0.0000	0.0000	7.51E-08
180	0.05	0.000	0.069	0.0191	0.6368	0.1082	8.12E-08	0.0000	0.0000	7.99E-08
181	0.00	0.000	0.027	0.0146	0.6654	0.1131	8.50E-08	0.0000	0.0000	8.35E-08
182	0.00	0.000	0.007	0.0134	0.6428	0.1092	8.20E-08	0.0000	0.0000	8.07E-08
183	0.00	0.000	0.002	0.0132	0.5704	0.0969	7.27E-08	0.0000	0.0000	7.15E-08
184	0.75	0.000	0.044	0.1308	0.4409	0.0749	5.60E-08	0.0000	0.0000	5.52E-08
185	0.00	0.000	0.099	0.0566	0.3082	0.0524	3.90E-08	0.0000	0.0000	3.85E-08
186	0.00	0.000	0.051	0.0238	0.2785	0.0473	3.52E-08	0.0000	0.0000	3.48E-08
187	0.00	0.000	0.058	0.0137	0.3258	0.0554	4.12E-08	0.0000	0.0000	4.08E-08
188	0.00	0.000	0.004	0.0130	0.4224	0.0718	5.36E-08	0.0000	0.0000	5.29E-08
189	0.00	0.000	0.000	0.0130	0.5467	0.0929	6.96E-08	0.0000	0.0000	6.85E-08
190	0.00	0.000	0.000	0.0130	0.5776	0.0982	7.36E-08	0.0000	0.0000	7.25E-08
191	0.45	0.000	0.040	0.0813	0.5331	0.0906	6.78E-08	0.0000	0.0000	6.68E-08
192	0.95	0.000	0.164	0.1793	0.4364	0.0742	5.54E-08	0.0000	0.0000	5.47E-08
193	0.00	0.000	0.055	0.0617	0.3372	0.0573	4.27E-08	0.0000	0.0000	4.22E-08
194	0.00	0.000	0.057	0.0242	0.3295	0.0560	4.17E-08	0.0000	0.0000	4.12E-08
195	0.00	0.000	0.057	0.0146	0.3461	0.0588	4.38E-08	0.0000	0.0000	4.33E-08
196	0.12	0.000	0.080	0.0212	0.4640	0.0788	5.89E-08	0.0000	0.0000	5.81E-08

197	0.02	0.000	0.039	0.0180	0.5584	0.0949	7.11E-08	0.0000	0.0000	7.00E-08
198	0.38	0.000	0.048	0.0733	0.5779	0.0982	7.36E-08	0.0000	0.0000	7.25E-08
199	0.00	0.000	0.110	0.0367	0.5159	0.0877	6.56E-08	0.0000	0.0000	6.47E-08
200	0.00	0.000	0.126	0.0146	0.3710	0.0630	4.70E-08	0.0000	0.0000	4.64E-08
201	0.86	0.000	0.060	0.1479	0.2627	0.0446	3.32E-08	0.0000	0.0000	3.28E-08
202	0.38	0.000	0.048	0.1359	0.3178	0.0540	4.02E-08	0.0000	0.0000	3.97E-08
203	0.00	0.000	0.137	0.0327	0.4432	0.0753	5.63E-08	0.0000	0.0000	5.55E-08
204	0.00	0.000	0.107	0.0138	0.4675	0.0794	5.94E-08	0.0000	0.0000	5.86E-08
205	0.00	0.000	0.005	0.0130	0.5275	0.0896	6.71E-08	0.0000	0.0000	6.61E-08
206	0.00	0.000	0.000	0.0130	0.5780	0.0982	7.36E-08	0.0000	0.0000	7.25E-08
207	0.00	0.000	0.000	0.0130	0.6028	0.1024	7.68E-08	0.0000	0.0000	7.56E-08
208	0.00	0.000	0.000	0.0130	0.5866	0.0997	7.48E-08	0.0000	0.0000	7.36E-08
209	0.00	0.000	0.000	0.0130	0.4822	0.0819	6.13E-08	0.0000	0.0000	6.04E-08
210	0.00	0.000	0.000	0.0130	0.3098	0.0526	3.92E-08	0.0000	0.0000	3.87E-08
211	0.11	0.000	0.030	0.0264	0.2566	0.0436	3.24E-08	0.0000	0.0000	3.21E-08
212	0.12	0.000	0.053	0.0375	0.3631	0.0617	4.60E-08	0.0000	0.0000	4.54E-08
213	1.95	0.000	0.056	0.1954	0.4850	0.0824	6.16E-08	0.0000	0.0000	6.08E-08
214	0.00	0.000	0.058	0.0315	0.5719	0.0972	7.28E-08	0.0000	0.0000	7.17E-08
215	0.09	0.000	0.141	0.0230	0.6013	0.1022	7.66E-08	0.0000	0.0000	7.54E-08
216	0.01	0.000	0.032	0.0189	0.6844	0.1163	8.74E-08	0.0000	0.0000	8.60E-08
217	0.00	0.000	0.030	0.0138	0.7456	0.1267	9.54E-08	0.0000	0.0000	9.37E-08
218	0.00	0.000	0.004	0.0132	0.6969	0.1184	8.91E-08	0.0000	0.0000	8.75E-08
219	0.00	0.000	0.001	0.0130	0.4817	0.0819	6.12E-08	0.0000	0.0000	6.04E-08
220	0.00	0.000	0.000	0.0130	0.3909	0.0664	4.96E-08	0.0000	0.0000	4.89E-08
221	0.00	0.000	0.000	0.0130	0.5277	0.0897	6.72E-08	0.0000	0.0000	6.62E-08
222	0.00	0.000	0.000	0.0130	0.6696	0.1138	8.55E-08	0.0000	0.0000	8.41E-08
223	0.00	0.000	0.000	0.0130	0.7580	0.1288	9.70E-08	0.0000	0.0000	9.53E-08
224	0.00	0.000	0.000	0.0130	0.8051	0.1368	1.03E-07	0.0000	0.0000	1.01E-07
225	0.00	0.000	0.000	0.0130	0.8255	0.1403	1.06E-07	0.0000	0.0000	1.04E-07
226	0.00	0.000	0.000	0.0130	0.8289	0.1409	1.06E-07	0.0000	0.0000	1.04E-07
227	0.00	0.000	0.000	0.0130	0.8218	0.1397	1.05E-07	0.0000	0.0000	1.03E-07
228	0.00	0.000	0.000	0.0130	0.8084	0.1374	1.04E-07	0.0000	0.0000	1.02E-07
229	0.00	0.000	0.000	0.0130	0.7914	0.1345	1.01E-07	0.0000	0.0000	9.95E-08
230	0.00	0.000	0.000	0.0130	0.7723	0.1312	9.89E-08	0.0000	0.0000	9.71E-08

231	0.00	0.000	0.000	0.0130	0.7523	0.1278	9.63E-08	0.0000	0.0000	9.46E-08
232	0.06	0.000	0.015	0.0206	0.7321	0.1244	9.36E-08	0.0000	0.0000	9.20E-08
233	0.05	0.000	0.034	0.0232	0.7120	0.1210	9.10E-08	0.0000	0.0000	8.95E-08
234	0.02	0.000	0.043	0.0193	0.6924	0.1177	8.85E-08	0.0000	0.0000	8.70E-08
235	0.00	0.000	0.025	0.0151	0.6734	0.1144	8.60E-08	0.0000	0.0000	8.46E-08
236	0.38	0.000	0.031	0.0733	0.6550	0.1113	8.36E-08	0.0000	0.0000	8.22E-08
237	0.00	0.000	0.048	0.0382	0.6374	0.1083	8.13E-08	0.0000	0.0000	8.00E-08
238	0.38	0.000	0.061	0.0914	0.6220	0.1057	7.93E-08	0.0000	0.0000	7.81E-08
239	0.00	0.000	0.040	0.0390	0.5978	0.1016	7.62E-08	0.0000	0.0000	7.50E-08
240	0.00	0.000	0.124	0.0174	0.6017	0.1022	7.67E-08	0.0000	0.0000	7.55E-08
241	0.07	0.000	0.031	0.0217	0.5689	0.0967	7.25E-08	0.0000	0.0000	7.14E-08
242	0.00	0.000	0.024	0.0177	0.5508	0.0936	7.01E-08	0.0000	0.0000	6.91E-08
243	0.01	0.000	0.033	0.0138	0.5699	0.0968	7.26E-08	0.0000	0.0000	7.15E-08
244	0.00	0.000	0.003	0.0132	0.5574	0.0947	7.10E-08	0.0000	0.0000	6.99E-08
245	0.00	0.000	0.001	0.0130	0.5168	0.0878	6.57E-08	0.0000	0.0000	6.48E-08
246	0.00	0.000	0.000	0.0130	0.4545	0.0772	5.77E-08	0.0000	0.0000	5.69E-08
247	0.03	0.000	0.012	0.0160	0.3781	0.0642	4.79E-08	0.0000	0.0000	4.73E-08
248	0.00	0.000	0.013	0.0139	0.3062	0.0520	3.87E-08	0.0000	0.0000	3.83E-08
249	0.00	0.000	0.004	0.0132	0.2675	0.0455	3.38E-08	0.0000	0.0000	3.34E-08
250	0.00	0.000	0.001	0.0130	0.2713	0.0461	3.43E-08	0.0000	0.0000	3.39E-08
251	0.00	0.000	0.000	0.0130	0.3022	0.0513	3.82E-08	0.0000	0.0000	3.78E-08
252	0.00	0.000	0.000	0.0130	0.3378	0.0574	4.28E-08	0.0000	0.0000	4.23E-08
253	0.00	0.000	0.000	0.0130	0.3684	0.0626	4.67E-08	0.0000	0.0000	4.61E-08
254	0.00	0.000	0.000	0.0130	0.3914	0.0665	4.96E-08	0.0000	0.0000	4.90E-08
255	0.00	0.000	0.000	0.0130	0.4062	0.0690	5.15E-08	0.0000	0.0000	5.09E-08
256	0.32	0.000	0.017	0.0635	0.4144	0.0704	5.26E-08	0.0000	0.0000	5.19E-08
257	0.02	0.000	0.025	0.0440	0.4182	0.0711	5.31E-08	0.0000	0.0000	5.24E-08
258	0.00	0.000	0.020	0.0373	0.4184	0.0711	5.31E-08	0.0000	0.0000	5.24E-08
259	0.00	0.000	0.013	0.0342	0.4168	0.0708	5.29E-08	0.0000	0.0000	5.22E-08
260	0.00	0.000	0.020	0.0303	0.4108	0.0698	5.21E-08	0.0000	0.0000	5.14E-08
261	0.00	0.000	0.019	0.0268	0.4073	0.0692	5.17E-08	0.0000	0.0000	5.10E-08
262	0.51	0.000	0.024	0.1073	0.4090	0.0695	5.19E-08	0.0000	0.0000	5.12E-08
263	0.19	0.000	0.072	0.0746	0.4093	0.0695	5.19E-08	0.0000	0.0000	5.12E-08
264	0.00	0.000	0.077	0.0414	0.3981	0.0676	5.05E-08	0.0000	0.0000	4.98E-08

265		0.28	0.000	0.092	0.0724	0.3945	0.0670	5.00E-08	0.0000	0.0000	4.94E-08
266		0.02	0.000	0.030	0.0469	0.3420	0.0581	4.33E-08	0.0000	0.0000	4.28E-08
267		0.00	0.000	0.030	0.0360	0.3240	0.0550	4.10E-08	0.0000	0.0000	4.05E-08
268		0.07	0.000	0.056	0.0368	0.3889	0.0661	4.93E-08	0.0000	0.0000	4.87E-08
269		0.11	0.000	0.065	0.0421	0.3833	0.0651	4.86E-08	0.0000	0.0000	4.80E-08
270		0.32	0.000	0.047	0.0861	0.3384	0.0575	4.28E-08	0.0000	0.0000	4.23E-08
271		0.95	0.000	0.063	0.1918	0.3191	0.0542	4.04E-08	0.0000	0.0000	3.99E-08
272	*	0.10	0.000	0.022	0.0505	0.3004	0.0510	3.80E-08	0.0000	0.0000	3.76E-08
273		0.08	0.000	0.004	0.0692	0.3132	0.0532	3.96E-08	0.0000	0.0000	3.92E-08
274	*	0.41	0.000	0.010	0.0600	0.3032	0.0515	3.83E-08	0.0000	0.0000	3.79E-08
275	*	0.00	0.000	0.008	0.0598	0.2461	0.0418	3.11E-08	0.0000	0.0000	3.08E-08
276		0.08	0.000	0.000	0.1097	0.1926	0.0327	2.43E-08	0.0000	0.0000	2.41E-08
277		0.02	0.000	0.044	0.0464	0.1392	0.0237	1.75E-08	0.0000	0.0000	1.74E-08
278	*	0.00	0.000	0.000	0.0388	0.1734	0.0295	2.19E-08	0.0000	0.0000	2.17E-08
279	*	0.00	0.000	0.038	0.0312	0.2200	0.0374	2.78E-08	0.0000	0.0000	2.75E-08
280		0.00	0.000	0.049	0.0217	0.1781	0.0303	2.24E-08	0.0000	0.0000	2.23E-08
281		0.00	0.000	0.033	0.0130	0.1204	0.0205	1.51E-08	0.0000	0.0000	1.50E-08
282		0.00	0.000	0.000	0.0130	0.1392	0.0236	1.75E-08	0.0000	0.0000	1.74E-08
283		0.00	0.000	0.000	0.0130	0.2081	0.0354	2.63E-08	0.0000	0.0000	2.60E-08
284		0.00	0.000	0.000	0.0130	0.2363	0.0401	2.98E-08	0.0000	0.0000	2.95E-08
285		0.56	0.000	0.017	0.1035	0.1976	0.0336	2.49E-08	0.0000	0.0000	2.47E-08
286		0.00	0.000	0.020	0.0552	0.1261	0.0214	1.59E-08	0.0000	0.0000	1.58E-08
287		0.00	0.000	0.041	0.0285	0.0939	0.0160	1.18E-08	0.0000	0.0000	1.17E-08
288		0.00	0.000	0.037	0.0211	0.1560	0.0265	1.97E-08	0.0000	0.0000	1.95E-08
289		0.00	0.000	0.032	0.0144	0.2371	0.0403	2.99E-08	0.0000	0.0000	2.96E-08
290	*	0.00	0.000	0.006	0.0130	0.4059	0.0690	5.15E-08	0.0000	0.0000	5.08E-08
291		0.00	0.000	0.000	0.0130	0.4853	0.0825	6.17E-08	0.0000	0.0000	6.08E-08
292		0.00	0.000	0.000	0.0130	0.4833	0.0821	6.14E-08	0.0000	0.0000	6.06E-08
293		0.00	0.000	0.000	0.0130	0.4339	0.0737	5.51E-08	0.0000	0.0000	5.43E-08
294		0.00	0.000	0.000	0.0130	0.3571	0.0607	4.52E-08	0.0000	0.0000	4.47E-08
295		0.00	0.000	0.000	0.0130	0.2921	0.0496	3.69E-08	0.0000	0.0000	3.65E-08
296		0.11	0.000	0.017	0.0285	0.2800	0.0476	3.54E-08	0.0000	0.0000	3.50E-08
297		0.05	0.000	0.012	0.0349	0.3166	0.0538	4.01E-08	0.0000	0.0000	3.96E-08
298	*	0.12	0.000	0.012	0.0382	0.3689	0.0627	4.67E-08	0.0000	0.0000	4.62E-08

299	*		0.32	0.000	0.009	0.0415	0.4146	0.0704	5.26E-08	0.0000	0.0000	5.19E-08
300	*		0.01	0.000	0.008	0.0448	0.4471	0.0760	5.68E-08	0.0000	0.0000	5.60E-08
301			0.20	0.000	0.000	0.0705	0.4677	0.0795	5.94E-08	0.0000	0.0000	5.86E-08
302			0.44	0.000	0.000	0.1163	0.4786	0.0813	6.08E-08	0.0000	0.0000	6.00E-08
303			0.03	0.000	0.000	0.0933	0.4852	0.0824	6.17E-08	0.0000	0.0000	6.08E-08
304			0.44	0.000	0.000	0.1458	0.4928	0.0837	6.26E-08	0.0000	0.0000	6.18E-08
305	*		0.01	0.000	0.018	0.0687	0.4590	0.0780	5.83E-08	0.0000	0.0000	5.75E-08
306	*		0.00	0.000	0.017	0.0300	0.4807	0.0817	6.11E-08	0.0000	0.0000	6.02E-08
307	*		0.00	0.000	0.016	0.0266	0.5198	0.0883	6.61E-08	0.0000	0.0000	6.52E-08
308	*		0.19	0.000	0.015	0.0296	0.5090	0.0865	6.47E-08	0.0000	0.0000	6.38E-08
309	*		0.23	0.000	0.009	0.0326	0.4807	0.0817	6.11E-08	0.0000	0.0000	6.02E-08
310	*		0.00	0.000	0.005	0.0357	0.4476	0.0761	5.68E-08	0.0000	0.0000	5.61E-08
311	*		0.00	0.000	0.006	0.0388	0.4288	0.0729	5.44E-08	0.0000	0.0000	5.37E-08
312	*		0.05	0.000	0.004	0.0420	0.4092	0.0695	5.19E-08	0.0000	0.0000	5.12E-08
313	*		0.00	0.000	0.006	0.0452	0.3615	0.0614	4.58E-08	0.0000	0.0000	4.52E-08
314			0.00	0.000	0.000	0.0643	0.2701	0.0459	3.41E-08	0.0000	0.0000	3.38E-08
315			0.02	0.000	0.000	0.0773	0.1660	0.0282	2.09E-08	0.0000	0.0000	2.07E-08
316			0.01	0.000	0.013	0.0522	0.1349	0.0229	1.70E-08	0.0000	0.0000	1.68E-08
317	*		0.44	0.000	0.008	0.0534	0.2210	0.0376	2.79E-08	0.0000	0.0000	2.76E-08
318	*		0.00	0.000	0.009	0.0549	0.3004	0.0510	3.80E-08	0.0000	0.0000	3.76E-08
319			0.00	0.000	0.000	0.0639	0.4562	0.0775	5.79E-08	0.0000	0.0000	5.71E-08
320			0.05	0.000	0.000	0.0792	0.5301	0.0901	6.74E-08	0.0000	0.0000	6.64E-08
321			0.01	0.000	0.000	0.0666	0.5390	0.0916	6.86E-08	0.0000	0.0000	6.76E-08
322			0.26	0.000	0.016	0.0827	0.5000	0.0850	6.36E-08	0.0000	0.0000	6.27E-08
323			0.07	0.000	0.012	0.0608	0.3595	0.0611	4.55E-08	0.0000	0.0000	4.50E-08
324			0.02	0.000	0.014	0.0563	0.3528	0.0600	4.47E-08	0.0000	0.0000	4.41E-08
325	*		0.00	0.000	0.008	0.0519	0.3905	0.0664	4.95E-08	0.0000	0.0000	4.89E-08
326	*		0.00	0.000	0.009	0.0485	0.4134	0.0702	5.24E-08	0.0000	0.0000	5.18E-08
327	*		0.24	0.000	0.009	0.0509	0.4141	0.0704	5.25E-08	0.0000	0.0000	5.18E-08
328	*		0.80	0.000	0.005	0.0533	0.4116	0.0699	5.22E-08	0.0000	0.0000	5.15E-08
329	*		0.08	0.000	0.006	0.0558	0.3961	0.0673	5.02E-08	0.0000	0.0000	4.96E-08
330	*		0.00	0.000	0.006	0.0582	0.3721	0.0632	4.72E-08	0.0000	0.0000	4.66E-08
331	*	*	0.02	0.000	0.000	0.0582	0.3112	0.0529	3.94E-08	0.0000	0.0000	3.89E-08
332	*	*	0.05	0.000	0.000	0.0582	0.2095	0.0356	2.64E-08	0.0000	0.0000	2.62E-08

333	*	*	0.18	0.000	0.007	0.0582	0.1292	0.0220	1.63E-08	0.0000	0.0000	1.61E-08
334	*	*	0.00	0.000	0.008	0.0582	0.1378	0.0234	1.73E-08	0.0000	0.0000	1.72E-08
335	*	*	0.00	0.000	0.008	0.0582	0.2354	0.0400	2.97E-08	0.0000	0.0000	2.94E-08
336	*	*	0.00	0.000	0.005	0.0582	0.3356	0.0570	4.25E-08	0.0000	0.0000	4.20E-08
337	*	*	0.00	0.000	0.006	0.0582	0.4086	0.0694	5.18E-08	0.0000	0.0000	5.11E-08
338	*	*	0.00	0.000	0.007	0.0582	0.4557	0.0774	5.79E-08	0.0000	0.0000	5.71E-08
339	*	*	0.00	0.000	0.007	0.0582	0.4839	0.0822	6.15E-08	0.0000	0.0000	6.06E-08
340	*	*	0.00	0.000	0.007	0.0582	0.4995	0.0849	6.35E-08	0.0000	0.0000	6.26E-08
341	*	*	0.00	0.000	0.008	0.0582	0.5064	0.0861	6.44E-08	0.0000	0.0000	6.35E-08
342		*	0.00	0.000	0.000	0.0582	0.5078	0.0863	6.46E-08	0.0000	0.0000	6.36E-08
343	*	*	0.34	0.000	0.000	0.0582	0.5055	0.0859	6.43E-08	0.0000	0.0000	6.34E-08
344	*	*	0.45	0.000	0.008	0.0582	0.5009	0.0851	6.37E-08	0.0000	0.0000	6.28E-08
345	*	*	0.39	0.000	0.004	0.0582	0.4947	0.0841	6.29E-08	0.0000	0.0000	6.20E-08
346	*	*	0.04	0.000	0.003	0.0582	0.4875	0.0828	6.20E-08	0.0000	0.0000	6.11E-08
347	*	*	0.00	0.000	0.004	0.0582	0.4798	0.0815	6.10E-08	0.0000	0.0000	6.01E-08
348	*	*	0.00	0.000	0.000	0.0582	0.4717	0.0802	5.99E-08	0.0000	0.0000	5.91E-08
349	*	*	0.00	0.000	0.000	0.0582	0.4635	0.0788	5.89E-08	0.0000	0.0000	5.81E-08
350	*	*	0.09	0.000	0.000	0.0582	0.4553	0.0774	5.78E-08	0.0000	0.0000	5.70E-08
351	*	*	0.32	0.000	0.006	0.0582	0.4471	0.0760	5.68E-08	0.0000	0.0000	5.60E-08
352	*	*	0.00	0.000	0.006	0.0582	0.4390	0.0746	5.57E-08	0.0000	0.0000	5.50E-08
353	*	*	0.08	0.000	0.006	0.0582	0.4310	0.0732	5.47E-08	0.0000	0.0000	5.40E-08
354	*	*	0.01	0.000	0.006	0.0582	0.4232	0.0719	5.37E-08	0.0000	0.0000	5.30E-08
355	*	*	0.00	0.000	0.006	0.0582	0.4155	0.0706	5.27E-08	0.0000	0.0000	5.20E-08
356	*	*	0.00	0.000	0.000	0.0582	0.4081	0.0693	5.18E-08	0.0000	0.0000	5.11E-08
357	*	*	0.20	0.000	0.007	0.0582	0.4008	0.0681	5.08E-08	0.0000	0.0000	5.02E-08
358	*	*	0.10	0.000	0.006	0.0582	0.3937	0.0669	4.99E-08	0.0000	0.0000	4.93E-08
359	*	*	0.00	0.000	0.003	0.0582	0.3868	0.0657	4.90E-08	0.0000	0.0000	4.84E-08
360	*	*	0.00	0.000	0.000	0.0582	0.3800	0.0646	4.82E-08	0.0000	0.0000	4.76E-08
361		*	0.00	0.000	0.000	0.0582	0.3735	0.0635	4.73E-08	0.0000	0.0000	4.67E-08
362		*	0.03	0.000	0.000	0.0994	0.3671	0.0624	4.65E-08	0.0000	0.0000	4.59E-08
363	*	*	0.00	0.000	0.004	0.1057	0.3609	0.0613	4.57E-08	0.0000	0.0000	4.52E-08
364	*	*	0.10	0.000	0.008	0.1057	0.3549	0.0603	4.50E-08	0.0000	0.0000	4.44E-08
365	*	*	0.00	0.000	0.006	0.1057	0.3490	0.0593	4.42E-08	0.0000	0.0000	4.37E-08

* = Frozen (air or soil)

Annual Totals for Year 4			
	inches	cubic feet	percent
Precipitation	36.35	989,628.8	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	5.666	154,244.7	15.59
Drainage Collected from Layer 3	28.7884	783,765.5	79.20
Percolation/Leakage through Layer 5	0.000022	0.5927	0.00
Average Head on Top of Layer 4	0.4629	---	---
Drainage Collected from Layer 6	0.0000	0.0108	0.00
Percolation/Leakage through Layer 7	0.000021	0.5819	0.00
Average Head on Top of Layer 7	0.0000	---	---
Change in Water Storage	1.8960	51,617.9	5.22
Soil Water at Start of Year	27.9130	759,931.1	76.79
Soil Water at End of Year	28.4695	775,081.6	78.32
Snow Water at Start of Year	1.7625	47,985.0	4.85
Snow Water at End of Year	3.1020	84,452.5	8.53
Annual Water Budget Balance	0.0000	0.0000	0.00

Daily Output for Year 5

Column key: Head #1: drainage from Layer 4 | Head #2: drainage from Layer 7
Drain #1: drainage from Layer 3 | Drain #2: drainage from Layer 6
Leak #1: leakage thru Layer 5 | Leak #2: leakage thru Layer 7

Title: WPC-Ore Pad Liner
Simulated On: 4/1/2026 23:24

Day	Freezing Status*		Rain	Runoff	ET	Evap. Zone Water	Head #1	Drain #1	Leak #1	Head #2	Drain #2	Leak #2
	Air	Soil	(inches)	(inches)	(inches)	(in/in)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)
1	*	*	0.00	0.000	0.005	0.1057	0.3378	0.0574	4.28E-08	0.0000	0.0000	4.23E-08
2	*	*	0.00	0.000	0.000	0.1057	0.3324	0.0565	4.21E-08	0.0000	0.0000	4.16E-08
3	*	*	0.34	0.000	0.005	0.1057	0.3272	0.0556	4.14E-08	0.0000	0.0000	4.09E-08
4	*	*	0.01	0.000	0.004	0.1057	0.3220	0.0547	4.08E-08	0.0000	0.0000	4.03E-08
5	*	*	0.07	0.000	0.003	0.1057	0.3171	0.0539	4.01E-08	0.0000	0.0000	3.97E-08
6	*	*	0.00	0.000	0.002	0.1057	0.3122	0.0531	3.95E-08	0.0000	0.0000	3.91E-08
7	*	*	0.01	0.000	0.003	0.1057	0.3075	0.0523	3.89E-08	0.0000	0.0000	3.85E-08
8	*	*	0.00	0.000	0.004	0.1057	0.3029	0.0515	3.83E-08	0.0000	0.0000	3.79E-08
9	*	*	0.01	0.000	0.000	0.1057	0.2985	0.0507	3.77E-08	0.0000	0.0000	3.73E-08
10	*	*	0.00	0.000	0.000	0.1057	0.2941	0.0500	3.72E-08	0.0000	0.0000	3.68E-08
11	*	*	0.03	0.000	0.000	0.1057	0.2899	0.0493	3.66E-08	0.0000	0.0000	3.62E-08
12	*	*	0.09	0.000	0.000	0.1057	0.2857	0.0485	3.61E-08	0.0000	0.0000	3.57E-08
13	*	*	0.08	0.000	0.005	0.1057	0.2817	0.0479	3.56E-08	0.0000	0.0000	3.52E-08
14	*	*	0.34	0.000	0.005	0.1057	0.2777	0.0472	3.51E-08	0.0000	0.0000	3.47E-08
15	*	*	0.07	0.000	0.004	0.1057	0.2739	0.0465	3.46E-08	0.0000	0.0000	3.42E-08
16	*	*	0.06	0.000	0.005	0.1057	0.2702	0.0459	3.41E-08	0.0000	0.0000	3.38E-08
17	*	*	0.02	0.000	0.000	0.1057	0.2665	0.0453	3.37E-08	0.0000	0.0000	3.33E-08
18	*	*	0.06	0.000	0.003	0.1057	0.2629	0.0447	3.32E-08	0.0000	0.0000	3.29E-08
19	*	*	0.22	0.000	0.003	0.1057	0.2595	0.0441	3.28E-08	0.0000	0.0000	3.24E-08
20	*	*	0.18	0.000	0.003	0.1057	0.2561	0.0435	3.23E-08	0.0000	0.0000	3.20E-08
21	*	*	0.06	0.000	0.000	0.1057	0.2527	0.0429	3.19E-08	0.0000	0.0000	3.16E-08
22	*	*	0.16	0.000	0.001	0.1057	0.2495	0.0424	3.15E-08	0.0000	0.0000	3.12E-08
23	*	*	0.02	0.000	0.002	0.1057	0.2463	0.0419	3.11E-08	0.0000	0.0000	3.08E-08
24	*	*	0.03	0.000	0.000	0.1057	0.2432	0.0413	3.07E-08	0.0000	0.0000	3.04E-08
25	*	*	0.00	0.000	0.002	0.1057	0.2402	0.0408	3.03E-08	0.0000	0.0000	3.00E-08
26	*	*	0.00	0.000	0.000	0.1057	0.2372	0.0403	2.99E-08	0.0000	0.0000	2.97E-08

27	*	*	0.03	0.000	0.000	0.1057	0.2343	0.0398	2.96E-08	0.0000	0.0000	2.93E-08
28	*	*	0.14	0.000	0.000	0.1057	0.2315	0.0393	2.92E-08	0.0000	0.0000	2.89E-08
29	*	*	0.01	0.000	0.001	0.1057	0.2287	0.0389	2.89E-08	0.0000	0.0000	2.86E-08
30	*	*	0.00	0.000	0.001	0.1057	0.2260	0.0384	2.85E-08	0.0000	0.0000	2.82E-08
31	*	*	0.00	0.000	0.002	0.1057	0.2234	0.0380	2.82E-08	0.0000	0.0000	2.79E-08
32	*	*	0.01	0.000	0.000	0.1057	0.2208	0.0375	2.79E-08	0.0000	0.0000	2.76E-08
33	*	*	0.19	0.000	0.000	0.1057	0.2182	0.0371	2.75E-08	0.0000	0.0000	2.73E-08
34	*	*	0.50	0.000	0.000	0.1057	0.2157	0.0367	2.72E-08	0.0000	0.0000	2.70E-08
35	*	*	0.00	0.000	0.002	0.1057	0.2133	0.0362	2.69E-08	0.0000	0.0000	2.67E-08
36	*	*	0.00	0.000	0.000	0.1057	0.2109	0.0358	2.66E-08	0.0000	0.0000	2.64E-08
37	*	*	0.00	0.000	0.000	0.1057	0.2086	0.0354	2.63E-08	0.0000	0.0000	2.61E-08
38	*	*	0.17	0.000	0.000	0.1057	0.2063	0.0350	2.60E-08	0.0000	0.0000	2.58E-08
39	*	*	0.01	0.000	0.000	0.1057	0.2040	0.0347	2.57E-08	0.0000	0.0000	2.55E-08
40	*	*	0.03	0.000	0.000	0.1057	0.2018	0.0343	2.55E-08	0.0000	0.0000	2.52E-08
41	*	*	0.13	0.000	0.005	0.1057	0.1996	0.0339	2.52E-08	0.0000	0.0000	2.49E-08
42	*	*	0.00	0.000	0.004	0.1057	0.1975	0.0336	2.49E-08	0.0000	0.0000	2.47E-08
43	*	*	0.06	0.000	0.000	0.1057	0.1955	0.0332	2.46E-08	0.0000	0.0000	2.44E-08
44	*	*	0.00	0.000	0.004	0.1057	0.1934	0.0329	2.44E-08	0.0000	0.0000	2.42E-08
45	*	*	0.00	0.000	0.004	0.1057	0.1914	0.0325	2.41E-08	0.0000	0.0000	2.39E-08
46	*	*	0.01	0.000	0.002	0.1057	0.1894	0.0322	2.39E-08	0.0000	0.0000	2.37E-08
47	*	*	0.00	0.000	0.004	0.1057	0.1875	0.0319	2.36E-08	0.0000	0.0000	2.34E-08
48	*	*	0.01	0.000	0.000	0.1057	0.1856	0.0315	2.34E-08	0.0000	0.0000	2.32E-08
49	*	*	0.00	0.000	0.000	0.1057	0.1838	0.0312	2.32E-08	0.0000	0.0000	2.30E-08
50	*	*	0.00	0.000	0.000	0.1057	0.1819	0.0309	2.29E-08	0.0000	0.0000	2.27E-08
51	*	*	0.25	0.000	0.000	0.1057	0.1802	0.0306	2.27E-08	0.0000	0.0000	2.25E-08
52	*	*	0.20	0.000	0.000	0.1057	0.1784	0.0303	2.25E-08	0.0000	0.0000	2.23E-08
53	*	*	0.00	0.000	0.005	0.1057	0.1767	0.0300	2.23E-08	0.0000	0.0000	2.21E-08
54	*	*	0.19	0.000	0.000	0.1057	0.1750	0.0297	2.20E-08	0.0000	0.0000	2.19E-08
55	*	*	0.01	0.000	0.000	0.1057	0.1733	0.0294	2.18E-08	0.0000	0.0000	2.17E-08
56	*	*	0.00	0.000	0.005	0.1057	0.1717	0.0292	2.16E-08	0.0000	0.0000	2.14E-08
57	*	*	0.00	0.000	0.006	0.1057	0.1701	0.0289	2.14E-08	0.0000	0.0000	2.12E-08
58	*	*	0.00	0.000	0.007	0.1057	0.1685	0.0286	2.12E-08	0.0000	0.0000	2.10E-08
59	*	*	0.00	0.000	0.000	0.1057	0.1669	0.0284	2.10E-08	0.0000	0.0000	2.09E-08
60	*	*	0.00	0.000	0.008	0.1057	0.1654	0.0281	2.08E-08	0.0000	0.0000	2.07E-08

61		*	0.00	0.000	0.000	0.1317	0.1639	0.0278	2.06E-08	0.0000	0.0000	2.05E-08
62		*	0.32	0.000	0.000	0.1855	0.1624	0.0276	2.05E-08	0.0000	0.0000	2.03E-08
63	*	*	0.08	0.000	0.000	0.1991	0.1610	0.0273	2.03E-08	0.0000	0.0000	2.01E-08
64	*	*	0.14	0.000	0.007	0.1996	0.1595	0.0271	2.01E-08	0.0000	0.0000	1.99E-08
65	*	*	0.17	0.000	0.008	0.1996	0.1581	0.0269	1.99E-08	0.0000	0.0000	1.98E-08
66	*	*	0.33	0.000	0.007	0.1996	0.1567	0.0266	1.97E-08	0.0000	0.0000	1.96E-08
67	*	*	0.15	0.000	0.000	0.1996	0.1554	0.0264	1.96E-08	0.0000	0.0000	1.94E-08
68	*	*	0.15	0.000	0.006	0.1996	0.1540	0.0262	1.94E-08	0.0000	0.0000	1.92E-08
69	*	*	0.00	0.000	0.004	0.1996	0.1527	0.0259	1.92E-08	0.0000	0.0000	1.91E-08
70		*	0.00	0.000	0.000	0.1996	0.1514	0.0257	1.91E-08	0.0000	0.0000	1.89E-08
71	*	*	0.18	0.000	0.007	0.1996	0.1501	0.0255	1.89E-08	0.0000	0.0000	1.88E-08
72	*	*	0.12	0.000	0.004	0.1996	0.1489	0.0253	1.87E-08	0.0000	0.0000	1.86E-08
73	*	*	0.00	0.000	0.006	0.1996	0.1476	0.0251	1.86E-08	0.0000	0.0000	1.84E-08
74	*	*	0.15	0.000	0.000	0.1996	0.1464	0.0249	1.84E-08	0.0000	0.0000	1.83E-08
75	*	*	0.07	0.000	0.000	0.1996	0.1452	0.0247	1.83E-08	0.0000	0.0000	1.81E-08
76	*	*	0.00	0.000	0.006	0.1996	0.1440	0.0245	1.81E-08	0.0000	0.0000	1.80E-08
77	*	*	0.03	0.000	0.000	0.1996	0.1428	0.0243	1.80E-08	0.0000	0.0000	1.78E-08
78	*	*	0.01	0.000	0.000	0.1996	0.1417	0.0241	1.78E-08	0.0000	0.0000	1.77E-08
79	*	*	0.01	0.000	0.000	0.1996	0.1406	0.0239	1.77E-08	0.0000	0.0000	1.76E-08
80		*	0.00	0.000	0.000	0.1996	0.1394	0.0237	1.76E-08	0.0000	0.0000	1.74E-08
81	*	*	0.04	0.000	0.008	0.1996	0.1383	0.0235	1.74E-08	0.0000	0.0000	1.73E-08
82	*	*	0.00	0.000	0.007	0.1996	0.1373	0.0233	1.73E-08	0.0000	0.0000	1.71E-08
83	*	*	0.00	0.000	0.000	0.1996	0.1362	0.0231	1.71E-08	0.0000	0.0000	1.70E-08
84	*	*	0.00	0.000	0.000	0.1996	0.1351	0.0230	1.70E-08	0.0000	0.0000	1.69E-08
85		*	0.00	0.000	0.001	0.2122	0.1341	0.0228	1.69E-08	0.0000	0.0000	1.68E-08
86		*	0.38	0.000	0.000	0.3886	0.1331	0.0226	1.67E-08	0.0000	0.0000	1.66E-08
87		*	0.00	0.000	0.000	0.3970	0.1322	0.0225	1.66E-08	0.0000	0.0000	1.65E-08
88		*	0.01	0.000	0.000	0.3970	0.1264	0.0215	1.59E-08	0.0000	0.0000	1.58E-08
89		*	0.06	0.000	0.000	0.3970	0.1322	0.0225	1.66E-08	0.0000	0.0000	1.65E-08
90	*	*	0.00	0.000	0.009	0.3970	0.1427	0.0242	1.80E-08	0.0000	0.0000	1.78E-08
91	*	*	0.06	0.000	0.009	0.3970	0.1341	0.0228	1.69E-08	0.0000	0.0000	1.67E-08
92	*	*	0.00	0.000	0.010	0.3970	0.1192	0.0203	1.50E-08	0.0000	0.0000	1.49E-08
93	*	*	0.00	0.000	0.019	0.3970	0.1114	0.0189	1.40E-08	0.0000	0.0000	1.39E-08
94		*	0.00	0.000	0.016	0.3970	0.1134	0.0193	1.43E-08	0.0000	0.0000	1.42E-08

95	*	*	0.02	0.000	0.009	0.3970	0.1087	0.0185	1.37E-08	0.0000	0.0000	1.36E-08
96	*	*	0.00	0.000	0.017	0.3970	0.1117	0.0190	1.40E-08	0.0000	0.0000	1.39E-08
97		*	0.01	0.000	0.000	0.3970	0.1423	0.0242	1.79E-08	0.0000	0.0000	1.78E-08
98	*	*	0.00	0.000	0.015	0.3970	0.1429	0.0243	1.80E-08	0.0000	0.0000	1.79E-08
99		*	0.10	0.000	0.000	0.3970	0.1535	0.0261	1.93E-08	0.0000	0.0000	1.92E-08
100	*	*	0.06	0.000	0.003	0.3970	0.1575	0.0268	1.98E-08	0.0000	0.0000	1.97E-08
101	*	*	0.04	0.000	0.022	0.3970	0.1590	0.0270	2.00E-08	0.0000	0.0000	1.99E-08
102	*	*	0.00	0.000	0.021	0.3970	0.1508	0.0256	1.90E-08	0.0000	0.0000	1.88E-08
103	*	*	0.00	0.000	0.010	0.3970	0.1421	0.0242	1.79E-08	0.0000	0.0000	1.78E-08
104	*	*	0.00	0.000	0.011	0.3970	0.1213	0.0206	1.53E-08	0.0000	0.0000	1.52E-08
105		*	0.00	0.000	0.021	0.3970	0.0958	0.0163	1.20E-08	0.0000	0.0000	1.20E-08
106		*	0.00	0.000	0.000	0.3970	0.0799	0.0136	1.00E-08	0.0000	0.0000	9.98E-09
107		*	0.00	0.000	0.000	0.3970	0.0642	0.0109	8.06E-09	0.0000	0.0000	8.02E-09
108		*	0.00	0.000	0.009	0.3970	0.0711	0.0121	8.93E-09	0.0000	0.0000	8.88E-09
109		*	0.38	0.000	0.000	0.3970	0.0944	0.0160	1.19E-08	0.0000	0.0000	1.18E-08
110		*	2.26	0.000	0.000	0.3970	0.1148	0.0195	1.44E-08	0.0000	0.0000	1.43E-08
111		*	0.01	0.000	0.000	0.3970	0.1215	0.0207	1.53E-08	0.0000	0.0000	1.52E-08
112		*	0.25	0.000	0.000	0.3970	0.1113	0.0189	1.40E-08	0.0000	0.0000	1.39E-08
113		*	0.03	0.000	0.000	0.3970	0.0849	0.0144	1.07E-08	0.0000	0.0000	1.06E-08
114		*	0.00	0.000	0.002	0.3970	0.0869	0.0148	1.09E-08	0.0000	0.0000	1.09E-08
115	*	*	0.00	0.000	0.000	0.3970	0.0625	0.0106	7.94E-09	0.0000	0.0000	7.90E-09
116		*	0.38	0.000	0.001	0.3970	0.0834	0.0142	1.05E-08	0.0000	0.0000	1.04E-08
117		*	0.11	0.000	0.001	0.3970	0.0634	0.0108	8.21E-09	0.0000	0.0000	8.17E-09
118	*	*	0.05	0.000	0.050	0.3970	0.4161	0.0707	5.29E-08	0.0000	0.0000	5.22E-08
119		*	0.02	0.000	0.001	0.3970	0.6818	0.1159	8.71E-08	0.0000	0.0000	8.56E-08
120		*	0.00	0.000	0.000	0.3970	0.7458	0.1267	9.54E-08	0.0000	0.0000	9.37E-08
121		*	0.00	0.000	0.000	0.3970	1.0345	0.1758	1.33E-07	0.0000	0.0000	1.31E-07
122		*	0.00	0.000	0.000	0.3970	1.2523	0.2128	1.62E-07	0.0000	0.0000	1.58E-07
123		*	0.00	0.000	0.000	0.3970	1.3709	0.2329	1.78E-07	0.0000	0.0000	1.74E-07
124	*	*	0.00	0.000	0.000	0.3970	1.4248	0.2421	1.85E-07	0.0000	0.0000	1.81E-07
125		*	0.00	0.000	0.000	0.3970	1.4337	0.2436	1.86E-07	0.0000	0.0000	1.82E-07
126		*	0.00	0.000	0.000	0.3970	1.4138	0.2402	1.84E-07	0.0000	0.0000	1.79E-07
127		*	0.01	0.000	0.001	0.3970	1.3772	0.2340	1.79E-07	0.0000	0.0000	1.75E-07
128			0.00	0.000	0.034	0.0130	1.3285	0.2257	1.72E-07	0.0000	0.0000	1.68E-07

129	0.00	0.000	0.000	0.0130	1.3443	0.2284	1.74E-07	0.0000	0.0000	1.70E-07
130	0.00	0.000	0.000	0.0130	1.1933	0.2028	1.54E-07	0.0000	0.0000	1.51E-07
131	0.01	0.000	0.010	0.0130	1.3563	0.2305	1.76E-07	0.0000	0.0000	1.72E-07
132	0.00	0.000	0.000	0.0130	1.5447	0.2625	2.01E-07	0.0000	0.0000	1.96E-07
133	0.00	0.000	0.000	0.0130	1.6108	0.2737	2.10E-07	0.0000	0.0000	2.05E-07
134	0.26	0.000	0.018	0.0533	1.6073	0.2731	2.10E-07	0.0000	0.0000	2.04E-07
135	0.84	0.000	0.048	0.1776	1.5665	0.2662	2.04E-07	0.0000	0.0000	1.99E-07
136	0.01	0.000	0.087	0.0689	1.5073	0.2561	1.96E-07	0.0000	0.0000	1.91E-07
137	0.00	0.000	0.118	0.0130	1.4316	0.2433	1.86E-07	0.0000	0.0000	1.82E-07
138	0.42	0.000	0.077	0.0702	1.4185	0.2410	1.84E-07	0.0000	0.0000	1.80E-07
139	0.16	0.000	0.120	0.0536	1.3534	0.2300	1.76E-07	0.0000	0.0000	1.71E-07
140	0.00	0.000	0.117	0.0341	1.1436	0.1943	1.48E-07	0.0000	0.0000	1.45E-07
141	0.13	0.000	0.076	0.0428	0.8032	0.1365	1.03E-07	0.0000	0.0000	1.01E-07
142	0.00	0.000	0.044	0.0347	0.7493	0.1273	9.59E-08	0.0000	0.0000	9.42E-08
143	0.01	0.000	0.064	0.0247	0.7617	0.1294	9.75E-08	0.0000	0.0000	9.58E-08
144	0.09	0.000	0.099	0.0219	0.8195	0.1393	1.05E-07	0.0000	0.0000	1.03E-07
145	1.15	0.000	0.036	0.2076	0.8944	0.1520	1.15E-07	0.0000	0.0000	1.13E-07
146	0.03	0.000	0.143	0.0233	0.9571	0.1626	1.23E-07	0.0000	0.0000	1.21E-07
147	0.07	0.000	0.066	0.0233	0.9714	0.1651	1.25E-07	0.0000	0.0000	1.22E-07
148	0.31	0.000	0.034	0.0692	1.0185	0.1731	1.31E-07	0.0000	0.0000	1.28E-07
149	0.07	0.000	0.129	0.0466	1.0458	0.1777	1.35E-07	0.0000	0.0000	1.32E-07
150	0.00	0.000	0.075	0.0290	0.9220	0.1567	1.18E-07	0.0000	0.0000	1.16E-07
151	0.25	0.000	0.053	0.0598	0.6444	0.1095	8.22E-08	0.0000	0.0000	8.09E-08
152	0.95	0.000	0.053	0.1951	0.6136	0.1043	7.82E-08	0.0000	0.0000	7.70E-08
153	0.05	0.000	0.155	0.0445	0.7212	0.1225	9.22E-08	0.0000	0.0000	9.06E-08
154	0.00	0.000	0.100	0.0148	0.7710	0.1310	9.87E-08	0.0000	0.0000	9.69E-08
155	0.00	0.000	0.008	0.0135	0.8872	0.1508	1.14E-07	0.0000	0.0000	1.12E-07
156	0.00	0.000	0.002	0.0131	0.9740	0.1655	1.25E-07	0.0000	0.0000	1.23E-07
157	0.00	0.000	0.000	0.0130	0.8902	0.1513	1.14E-07	0.0000	0.0000	1.12E-07
158	0.99	0.000	0.108	0.1599	0.6242	0.1061	7.96E-08	0.0000	0.0000	7.84E-08
159	0.00	0.000	0.149	0.0646	0.5987	0.1017	7.63E-08	0.0000	0.0000	7.51E-08
160	0.11	0.000	0.078	0.0255	0.7502	0.1275	9.60E-08	0.0000	0.0000	9.43E-08
161	0.66	0.000	0.123	0.1150	0.8814	0.1498	1.13E-07	0.0000	0.0000	1.11E-07
162	0.06	0.000	0.111	0.0565	0.9841	0.1672	1.27E-07	0.0000	0.0000	1.24E-07

163	0.00	0.000	0.171	0.0144	0.9380	0.1594	1.21E-07	0.0000	0.0000	1.18E-07
164	0.25	0.000	0.067	0.0447	0.7059	0.1199	9.02E-08	0.0000	0.0000	8.87E-08
165	0.07	0.000	0.069	0.0448	0.7770	0.1320	9.95E-08	0.0000	0.0000	9.77E-08
166	0.13	0.000	0.189	0.0347	0.7851	0.1334	1.01E-07	0.0000	0.0000	9.87E-08
167	0.03	0.000	0.112	0.0203	0.6195	0.1053	7.90E-08	0.0000	0.0000	7.77E-08
168	0.20	0.000	0.052	0.0450	0.5988	0.1018	7.63E-08	0.0000	0.0000	7.51E-08
169	0.01	0.000	0.071	0.0349	0.7376	0.1253	9.43E-08	0.0000	0.0000	9.27E-08
170	0.00	0.000	0.057	0.0254	0.8449	0.1436	1.08E-07	0.0000	0.0000	1.06E-07
171	0.00	0.000	0.045	0.0177	0.9015	0.1532	1.16E-07	0.0000	0.0000	1.14E-07
172	0.00	0.000	0.024	0.0130	0.9270	0.1575	1.19E-07	0.0000	0.0000	1.17E-07
173	0.00	0.000	0.000	0.0130	0.9334	0.1586	1.20E-07	0.0000	0.0000	1.18E-07
174	0.01	0.000	0.006	0.0136	0.9276	0.1576	1.19E-07	0.0000	0.0000	1.17E-07
175	0.24	0.000	0.020	0.0502	0.9170	0.1558	1.18E-07	0.0000	0.0000	1.16E-07
176	0.36	0.000	0.036	0.0981	0.8956	0.1522	1.15E-07	0.0000	0.0000	1.13E-07
177	0.04	0.000	0.106	0.0377	0.8704	0.1479	1.12E-07	0.0000	0.0000	1.10E-07
178	0.01	0.000	0.127	0.0171	0.8505	0.1445	1.09E-07	0.0000	0.0000	1.07E-07
179	0.00	0.000	0.018	0.0132	0.8026	0.1364	1.03E-07	0.0000	0.0000	1.01E-07
180	0.00	0.000	0.001	0.0131	0.8548	0.1452	1.10E-07	0.0000	0.0000	1.08E-07
181	0.00	0.000	0.000	0.0130	0.8084	0.1374	1.04E-07	0.0000	0.0000	1.02E-07
182	0.00	0.000	0.000	0.0130	0.7067	0.1201	9.03E-08	0.0000	0.0000	8.88E-08
183	0.17	0.000	0.017	0.0385	0.5872	0.0998	7.48E-08	0.0000	0.0000	7.37E-08
184	0.00	0.000	0.028	0.0338	0.5015	0.0852	6.38E-08	0.0000	0.0000	6.29E-08
185	0.00	0.000	0.032	0.0286	0.4815	0.0818	6.12E-08	0.0000	0.0000	6.03E-08
186	0.63	0.000	0.030	0.1286	0.5042	0.0857	6.41E-08	0.0000	0.0000	6.32E-08
187	0.27	0.000	0.046	0.1020	0.5357	0.0910	6.82E-08	0.0000	0.0000	6.72E-08
188	0.01	0.000	0.096	0.0395	0.5713	0.0971	7.28E-08	0.0000	0.0000	7.16E-08
189	0.27	0.000	0.083	0.0665	0.5568	0.0946	7.09E-08	0.0000	0.0000	6.98E-08
190	0.01	0.000	0.044	0.0443	0.6020	0.1023	7.67E-08	0.0000	0.0000	7.55E-08
191	0.00	0.000	0.055	0.0290	0.6459	0.1098	8.24E-08	0.0000	0.0000	8.11E-08
192	0.00	0.000	0.082	0.0131	0.6654	0.1131	8.50E-08	0.0000	0.0000	8.36E-08
193	0.00	0.000	0.000	0.0130	0.5576	0.0948	7.10E-08	0.0000	0.0000	6.99E-08
194	0.06	0.000	0.019	0.0199	0.4757	0.0808	6.05E-08	0.0000	0.0000	5.96E-08
195	0.03	0.000	0.033	0.0194	0.4286	0.0728	5.44E-08	0.0000	0.0000	5.37E-08
196	0.16	0.000	0.036	0.0401	0.3790	0.0644	4.80E-08	0.0000	0.0000	4.74E-08

197	0.00	0.000	0.049	0.0319	0.2935	0.0499	3.71E-08	0.0000	0.0000	3.67E-08
198	0.00	0.000	0.038	0.0256	0.2250	0.0382	2.84E-08	0.0000	0.0000	2.81E-08
199	0.00	0.000	0.043	0.0185	0.2452	0.0417	3.10E-08	0.0000	0.0000	3.06E-08
200	0.00	0.000	0.028	0.0137	0.3266	0.0555	4.13E-08	0.0000	0.0000	4.09E-08
201	0.00	0.000	0.003	0.0130	0.4108	0.0698	5.21E-08	0.0000	0.0000	5.14E-08
202	0.00	0.000	0.000	0.0130	0.4733	0.0804	6.01E-08	0.0000	0.0000	5.93E-08
203	0.00	0.000	0.000	0.0130	0.5108	0.0868	6.50E-08	0.0000	0.0000	6.40E-08
204	0.00	0.000	0.000	0.0130	0.5340	0.0907	6.80E-08	0.0000	0.0000	6.69E-08
205	0.01	0.000	0.006	0.0137	0.5455	0.0927	6.94E-08	0.0000	0.0000	6.84E-08
206	0.00	0.000	0.002	0.0133	0.5486	0.0932	6.98E-08	0.0000	0.0000	6.88E-08
207	0.00	0.000	0.001	0.0131	0.5462	0.0928	6.95E-08	0.0000	0.0000	6.85E-08
208	0.00	0.000	0.000	0.0130	0.5408	0.0919	6.88E-08	0.0000	0.0000	6.78E-08
209	0.00	0.000	0.000	0.0130	0.5335	0.0907	6.79E-08	0.0000	0.0000	6.69E-08
210	0.00	0.000	0.000	0.0130	0.5253	0.0893	6.68E-08	0.0000	0.0000	6.58E-08
211	1.07	0.000	0.040	0.1847	0.5163	0.0877	6.57E-08	0.0000	0.0000	6.47E-08
212	0.00	0.000	0.094	0.0596	0.5034	0.0855	6.40E-08	0.0000	0.0000	6.31E-08
213	0.36	0.000	0.137	0.0597	0.5049	0.0858	6.42E-08	0.0000	0.0000	6.33E-08
214	0.00	0.000	0.045	0.0418	0.4796	0.0815	6.10E-08	0.0000	0.0000	6.01E-08
215	0.02	0.000	0.170	0.0138	0.4682	0.0796	5.95E-08	0.0000	0.0000	5.87E-08
216	0.00	0.000	0.005	0.0130	0.5199	0.0883	6.61E-08	0.0000	0.0000	6.52E-08
217	0.00	0.000	0.000	0.0130	0.4912	0.0835	6.24E-08	0.0000	0.0000	6.16E-08
218	0.00	0.000	0.000	0.0130	0.4616	0.0784	5.86E-08	0.0000	0.0000	5.78E-08
219	0.00	0.000	0.000	0.0130	0.4426	0.0752	5.62E-08	0.0000	0.0000	5.54E-08
220	0.00	0.000	0.000	0.0130	0.4149	0.0705	5.26E-08	0.0000	0.0000	5.19E-08
221	0.03	0.000	0.012	0.0161	0.3632	0.0617	4.60E-08	0.0000	0.0000	4.54E-08
222	0.17	0.000	0.041	0.0376	0.2812	0.0478	3.56E-08	0.0000	0.0000	3.52E-08
223	1.12	0.000	0.042	0.2173	0.1974	0.0335	2.49E-08	0.0000	0.0000	2.47E-08
224	0.99	0.000	0.134	0.1835	0.1611	0.0274	2.03E-08	0.0000	0.0000	2.01E-08
225	0.49	0.000	0.111	0.1216	0.2022	0.0344	2.55E-08	0.0000	0.0000	2.53E-08
226	0.00	0.000	0.094	0.0394	0.2350	0.0399	2.97E-08	0.0000	0.0000	2.94E-08
227	0.00	0.000	0.037	0.0321	0.3359	0.0571	4.25E-08	0.0000	0.0000	4.20E-08
228	0.00	0.000	0.095	0.0130	0.4037	0.0686	5.12E-08	0.0000	0.0000	5.05E-08
229	0.00	0.000	0.000	0.0130	0.4222	0.0717	5.36E-08	0.0000	0.0000	5.29E-08
230	0.07	0.000	0.017	0.0218	0.4233	0.0719	5.37E-08	0.0000	0.0000	5.30E-08

231	0.00	0.000	0.021	0.0183	0.4278	0.0727	5.43E-08	0.0000	0.0000	5.36E-08
232	0.37	0.000	0.026	0.0757	0.4186	0.0711	5.31E-08	0.0000	0.0000	5.24E-08
233	0.00	0.000	0.034	0.0397	0.3482	0.0592	4.41E-08	0.0000	0.0000	4.36E-08
234	0.00	0.000	0.112	0.0203	0.2284	0.0388	2.88E-08	0.0000	0.0000	2.86E-08
235	0.32	0.000	0.047	0.0646	0.1693	0.0288	2.13E-08	0.0000	0.0000	2.12E-08
236	0.02	0.000	0.053	0.0424	0.3278	0.0557	4.15E-08	0.0000	0.0000	4.10E-08
237	0.00	0.000	0.112	0.0197	0.4597	0.0781	5.84E-08	0.0000	0.0000	5.76E-08
238	0.00	0.000	0.030	0.0131	0.4960	0.0843	6.31E-08	0.0000	0.0000	6.22E-08
239	1.60	0.000	0.050	0.2031	0.5116	0.0869	6.51E-08	0.0000	0.0000	6.41E-08
240	0.00	0.000	0.054	0.0187	0.5530	0.0940	7.04E-08	0.0000	0.0000	6.93E-08
241	0.00	0.000	0.030	0.0138	0.5525	0.0939	7.03E-08	0.0000	0.0000	6.93E-08
242	0.00	0.000	0.005	0.0130	0.5236	0.0890	6.66E-08	0.0000	0.0000	6.56E-08
243	0.24	0.000	0.021	0.0494	0.5904	0.1003	7.52E-08	0.0000	0.0000	7.41E-08
244	0.00	0.000	0.023	0.0456	0.6291	0.1069	8.03E-08	0.0000	0.0000	7.90E-08
245	0.03	0.000	0.042	0.0376	0.5194	0.0883	6.61E-08	0.0000	0.0000	6.51E-08
246	0.01	0.000	0.045	0.0301	0.3399	0.0578	4.30E-08	0.0000	0.0000	4.25E-08
247	0.00	0.000	0.076	0.0150	0.3843	0.0653	4.87E-08	0.0000	0.0000	4.81E-08
248	0.00	0.000	0.008	0.0131	0.5494	0.0934	6.99E-08	0.0000	0.0000	6.89E-08
249	0.00	0.000	0.000	0.0130	0.6667	0.1133	8.51E-08	0.0000	0.0000	8.37E-08
250	0.73	0.000	0.103	0.1175	0.7404	0.1258	9.47E-08	0.0000	0.0000	9.31E-08
251	0.06	0.000	0.050	0.0686	0.7685	0.1306	9.84E-08	0.0000	0.0000	9.66E-08
252	0.00	0.000	0.088	0.0184	0.7735	0.1314	9.90E-08	0.0000	0.0000	9.73E-08
253	0.00	0.000	0.031	0.0131	0.7443	0.1265	9.52E-08	0.0000	0.0000	9.35E-08
254	0.00	0.000	0.000	0.0130	0.7824	0.1329	1.00E-07	0.0000	0.0000	9.84E-08
255	0.00	0.000	0.000	0.0130	0.8233	0.1399	1.06E-07	0.0000	0.0000	1.04E-07
256	0.00	0.000	0.000	0.0130	0.7648	0.1299	9.79E-08	0.0000	0.0000	9.61E-08
257	0.00	0.000	0.000	0.0130	0.6299	0.1070	8.04E-08	0.0000	0.0000	7.91E-08
258	0.00	0.000	0.000	0.0130	0.4703	0.0799	5.98E-08	0.0000	0.0000	5.89E-08
259	0.28	0.000	0.034	0.0540	0.4093	0.0695	5.19E-08	0.0000	0.0000	5.12E-08
260	0.49	0.000	0.029	0.1220	0.4569	0.0776	5.80E-08	0.0000	0.0000	5.72E-08
261	0.00	0.000	0.073	0.0410	0.5286	0.0898	6.73E-08	0.0000	0.0000	6.63E-08
262	0.00	0.000	0.080	0.0228	0.5917	0.1005	7.54E-08	0.0000	0.0000	7.42E-08
263	0.00	0.000	0.047	0.0130	0.5928	0.1007	7.56E-08	0.0000	0.0000	7.44E-08
264	0.00	0.000	0.000	0.0130	0.6767	0.1150	8.64E-08	0.0000	0.0000	8.50E-08

265		0.00	0.000	0.000	0.0130	0.7122	0.1210	9.10E-08	0.0000	0.0000	8.95E-08
266		0.02	0.000	0.010	0.0147	0.6804	0.1156	8.69E-08	0.0000	0.0000	8.54E-08
267		0.00	0.000	0.008	0.0134	0.5942	0.1010	7.57E-08	0.0000	0.0000	7.45E-08
268		0.07	0.000	0.017	0.0223	0.4651	0.0790	5.91E-08	0.0000	0.0000	5.83E-08
269		0.03	0.000	0.018	0.0243	0.3589	0.0610	4.55E-08	0.0000	0.0000	4.49E-08
270		0.00	0.000	0.048	0.0164	0.3473	0.0590	4.40E-08	0.0000	0.0000	4.35E-08
271		0.00	0.000	0.018	0.0134	0.4025	0.0684	5.10E-08	0.0000	0.0000	5.04E-08
272		0.22	0.000	0.031	0.0449	0.4660	0.0792	5.92E-08	0.0000	0.0000	5.84E-08
273		0.00	0.000	0.024	0.0408	0.5138	0.0873	6.53E-08	0.0000	0.0000	6.44E-08
274		0.00	0.000	0.061	0.0306	0.5437	0.0924	6.92E-08	0.0000	0.0000	6.82E-08
275		0.02	0.000	0.070	0.0206	0.5600	0.0952	7.13E-08	0.0000	0.0000	7.02E-08
276		0.99	0.000	0.023	0.1809	0.5670	0.0963	7.22E-08	0.0000	0.0000	7.11E-08
277		0.00	0.000	0.021	0.0548	0.5636	0.0958	7.18E-08	0.0000	0.0000	7.07E-08
278		0.00	0.000	0.021	0.0223	0.5671	0.0964	7.22E-08	0.0000	0.0000	7.11E-08
279	*	0.02	0.000	0.017	0.0227	0.5436	0.0924	6.92E-08	0.0000	0.0000	6.82E-08
280		0.00	0.000	0.040	0.0160	0.5800	0.0986	7.39E-08	0.0000	0.0000	7.28E-08
281		0.00	0.000	0.018	0.0130	0.6082	0.1034	7.75E-08	0.0000	0.0000	7.63E-08
282		0.25	0.000	0.016	0.0521	0.5985	0.1017	7.63E-08	0.0000	0.0000	7.51E-08
283		0.14	0.000	0.025	0.0656	0.5519	0.0938	7.03E-08	0.0000	0.0000	6.92E-08
284	*	0.00	0.000	0.036	0.0492	0.4631	0.0787	5.88E-08	0.0000	0.0000	5.80E-08
285		0.00	0.000	0.017	0.0446	0.3439	0.0584	4.36E-08	0.0000	0.0000	4.30E-08
286		0.00	0.000	0.017	0.0409	0.2313	0.0393	2.92E-08	0.0000	0.0000	2.89E-08
287		0.00	0.000	0.036	0.0344	0.2343	0.0398	2.96E-08	0.0000	0.0000	2.93E-08
288		0.22	0.000	0.034	0.0649	0.3135	0.0533	3.97E-08	0.0000	0.0000	3.92E-08
289		0.00	0.000	0.030	0.0447	0.3801	0.0646	4.82E-08	0.0000	0.0000	4.76E-08
290		0.28	0.000	0.028	0.0836	0.4198	0.0713	5.33E-08	0.0000	0.0000	5.26E-08
291		0.05	0.000	0.033	0.0498	0.4301	0.0731	5.46E-08	0.0000	0.0000	5.39E-08
292		0.00	0.000	0.031	0.0368	0.4432	0.0753	5.63E-08	0.0000	0.0000	5.55E-08
293		0.00	0.000	0.029	0.0308	0.4529	0.0770	5.75E-08	0.0000	0.0000	5.67E-08
294		0.07	0.000	0.032	0.0368	0.4520	0.0768	5.74E-08	0.0000	0.0000	5.66E-08
295		0.00	0.000	0.016	0.0334	0.5112	0.0869	6.50E-08	0.0000	0.0000	6.41E-08
296		0.00	0.000	0.029	0.0274	0.5307	0.0902	6.75E-08	0.0000	0.0000	6.65E-08
297		0.37	0.000	0.032	0.0831	0.5068	0.0861	6.44E-08	0.0000	0.0000	6.35E-08
298		0.19	0.000	0.024	0.0700	0.4543	0.0772	5.77E-08	0.0000	0.0000	5.69E-08

299		0.00	0.000	0.027	0.0494	0.3575	0.0607	4.53E-08	0.0000	0.0000	4.47E-08
300		0.00	0.000	0.014	0.0440	0.2998	0.0510	3.79E-08	0.0000	0.0000	3.75E-08
301		0.00	0.000	0.015	0.0395	0.2199	0.0374	2.77E-08	0.0000	0.0000	2.75E-08
302		0.00	0.000	0.025	0.0341	0.2595	0.0441	3.28E-08	0.0000	0.0000	3.24E-08
303		0.77	0.000	0.035	0.1557	0.3533	0.0600	4.47E-08	0.0000	0.0000	4.42E-08
304		0.52	0.000	0.029	0.1575	0.3986	0.0677	5.05E-08	0.0000	0.0000	4.99E-08
305		0.51	0.000	0.015	0.1375	0.3983	0.0677	5.05E-08	0.0000	0.0000	4.99E-08
306		0.00	0.000	0.020	0.0515	0.3711	0.0631	4.70E-08	0.0000	0.0000	4.64E-08
307		0.00	0.000	0.014	0.0361	0.2612	0.0444	3.30E-08	0.0000	0.0000	3.27E-08
308	*	0.15	0.000	0.012	0.0383	0.2375	0.0404	3.00E-08	0.0000	0.0000	2.97E-08
309		0.00	0.000	0.004	0.0565	0.2631	0.0447	3.32E-08	0.0000	0.0000	3.29E-08
310		0.02	0.000	0.016	0.0554	0.3044	0.0517	3.85E-08	0.0000	0.0000	3.81E-08
311		0.00	0.000	0.013	0.0513	0.3495	0.0594	4.43E-08	0.0000	0.0000	4.37E-08
312		0.00	0.000	0.014	0.0477	0.3791	0.0644	4.80E-08	0.0000	0.0000	4.74E-08
313	*	0.02	0.000	0.013	0.0478	0.3483	0.0592	4.41E-08	0.0000	0.0000	4.36E-08
314	*	0.00	0.000	0.011	0.0449	0.2370	0.0403	2.99E-08	0.0000	0.0000	2.96E-08
315		0.00	0.000	0.019	0.0409	0.1589	0.0270	2.00E-08	0.0000	0.0000	1.99E-08
316	*	0.09	0.000	0.008	0.0434	0.2382	0.0405	3.01E-08	0.0000	0.0000	2.98E-08
317	*	0.00	0.000	0.007	0.0461	0.3817	0.0649	4.84E-08	0.0000	0.0000	4.78E-08
318	*	0.00	0.000	0.008	0.0488	0.4903	0.0833	6.23E-08	0.0000	0.0000	6.14E-08
319		0.00	0.000	0.012	0.0477	0.5578	0.0948	7.10E-08	0.0000	0.0000	7.00E-08
320		0.00	0.000	0.011	0.0454	0.5936	0.1009	7.57E-08	0.0000	0.0000	7.45E-08
321		0.01	0.000	0.015	0.0441	0.6101	0.1037	7.78E-08	0.0000	0.0000	7.66E-08
322		0.05	0.000	0.016	0.0494	0.6160	0.1047	7.86E-08	0.0000	0.0000	7.73E-08
323		0.01	0.000	0.014	0.0485	0.6136	0.1043	7.82E-08	0.0000	0.0000	7.70E-08
324		0.00	0.000	0.011	0.0464	0.6077	0.1033	7.75E-08	0.0000	0.0000	7.62E-08
325		0.30	0.000	0.014	0.0929	0.6010	0.1021	7.66E-08	0.0000	0.0000	7.54E-08
326	*	0.02	0.000	0.010	0.0492	0.5917	0.1005	7.54E-08	0.0000	0.0000	7.42E-08
327	*	0.00	0.000	0.009	0.0417	0.5858	0.0995	7.46E-08	0.0000	0.0000	7.35E-08
328	*	0.00	0.000	0.010	0.0392	0.5498	0.0934	7.00E-08	0.0000	0.0000	6.89E-08
329	*	0.00	0.000	0.000	0.0386	0.5549	0.0943	7.06E-08	0.0000	0.0000	6.96E-08
330	*	0.00	0.000	0.000	0.0380	0.6014	0.1022	7.67E-08	0.0000	0.0000	7.55E-08
331	*	0.12	0.000	0.008	0.0408	0.5922	0.1006	7.55E-08	0.0000	0.0000	7.43E-08
332	*	0.23	0.000	0.000	0.0437	0.5396	0.0917	6.87E-08	0.0000	0.0000	6.77E-08

333	*	*	1.10	0.000	0.008	0.0437	0.4625	0.0786	5.87E-08	0.0000	0.0000	5.79E-08
334	*	*	0.00	0.000	0.008	0.0437	0.3769	0.0641	4.78E-08	0.0000	0.0000	4.72E-08
335	*	*	0.00	0.000	0.007	0.0437	0.3082	0.0524	3.90E-08	0.0000	0.0000	3.85E-08
336	*	*	0.00	0.000	0.008	0.0437	0.2827	0.0480	3.57E-08	0.0000	0.0000	3.53E-08
337	*	*	0.08	0.000	0.006	0.0437	0.2947	0.0501	3.73E-08	0.0000	0.0000	3.69E-08
338	*	*	0.22	0.000	0.006	0.0437	0.3239	0.0550	4.10E-08	0.0000	0.0000	4.05E-08
339		*	0.01	0.000	0.000	0.0509	0.3547	0.0603	4.49E-08	0.0000	0.0000	4.44E-08
340	*	*	0.00	0.000	0.005	0.0525	0.3801	0.0646	4.82E-08	0.0000	0.0000	4.76E-08
341	*	*	0.02	0.000	0.008	0.0525	0.3987	0.0677	5.06E-08	0.0000	0.0000	4.99E-08
342	*	*	0.02	0.000	0.000	0.0525	0.4110	0.0698	5.21E-08	0.0000	0.0000	5.15E-08
343	*	*	0.10	0.000	0.009	0.0525	0.4182	0.0711	5.31E-08	0.0000	0.0000	5.24E-08
344	*	*	0.00	0.000	0.009	0.0525	0.4216	0.0716	5.35E-08	0.0000	0.0000	5.28E-08
345		*	0.11	0.000	0.000	0.0586	0.4221	0.0717	5.36E-08	0.0000	0.0000	5.29E-08
346	*	*	0.11	0.000	0.008	0.0597	0.4206	0.0715	5.34E-08	0.0000	0.0000	5.27E-08
347		*	0.15	0.000	0.000	0.0764	0.4177	0.0710	5.30E-08	0.0000	0.0000	5.23E-08
348	*	*	0.63	0.000	0.003	0.0797	0.4137	0.0703	5.25E-08	0.0000	0.0000	5.18E-08
349	*	*	0.14	0.000	0.004	0.0797	0.4091	0.0695	5.19E-08	0.0000	0.0000	5.13E-08
350	*	*	0.00	0.000	0.008	0.0797	0.4040	0.0686	5.12E-08	0.0000	0.0000	5.06E-08
351	*	*	0.00	0.000	0.008	0.0797	0.3986	0.0677	5.05E-08	0.0000	0.0000	4.99E-08
352	*	*	0.03	0.000	0.003	0.0797	0.3930	0.0668	4.98E-08	0.0000	0.0000	4.92E-08
353	*	*	0.00	0.000	0.000	0.0797	0.3873	0.0658	4.91E-08	0.0000	0.0000	4.85E-08
354	*	*	0.25	0.000	0.003	0.0797	0.3815	0.0648	4.84E-08	0.0000	0.0000	4.78E-08
355	*	*	0.17	0.000	0.005	0.0797	0.3758	0.0639	4.76E-08	0.0000	0.0000	4.70E-08
356	*	*	0.00	0.000	0.006	0.0797	0.3701	0.0629	4.69E-08	0.0000	0.0000	4.63E-08
357	*	*	0.08	0.000	0.003	0.0797	0.3644	0.0619	4.62E-08	0.0000	0.0000	4.56E-08
358	*	*	0.08	0.000	0.003	0.0797	0.3588	0.0610	4.55E-08	0.0000	0.0000	4.49E-08
359	*	*	0.18	0.000	0.001	0.0797	0.3533	0.0600	4.48E-08	0.0000	0.0000	4.42E-08
360	*	*	0.00	0.000	0.003	0.0797	0.3479	0.0591	4.41E-08	0.0000	0.0000	4.35E-08
361	*	*	0.04	0.000	0.000	0.0797	0.3426	0.0582	4.34E-08	0.0000	0.0000	4.29E-08
362	*	*	0.01	0.000	0.000	0.0797	0.3374	0.0573	4.27E-08	0.0000	0.0000	4.22E-08
363	*	*	0.01	0.000	0.000	0.0797	0.3323	0.0565	4.21E-08	0.0000	0.0000	4.16E-08
364	*	*	0.00	0.000	0.000	0.0797	0.3273	0.0556	4.14E-08	0.0000	0.0000	4.09E-08
365	*	*	0.00	0.000	0.000	0.0797	0.3225	0.0548	4.08E-08	0.0000	0.0000	4.03E-08

* = Frozen (air or soil)

Annual Totals for Year 5			
	inches	cubic feet	percent
Precipitation	37.37	1,017,398.3	100.00
Runoff	0.000	0.0000	0.00
Evapotranspiration	8.606	234,289.2	23.03
Drainage Collected from Layer 3	28.6982	781,308.2	76.79
Percolation/Leakage through Layer 5	0.000022	0.5871	0.00
Average Head on Top of Layer 4	0.4627	---	---
Drainage Collected from Layer 6	0.0000	0.0095	0.00
Percolation/Leakage through Layer 7	0.000021	0.5777	0.00
Average Head on Top of Layer 7	0.0000	---	---
Change in Water Storage	0.0661	1,800.2	0.18
Soil Water at Start of Year	28.4695	775,081.6	76.18
Soil Water at End of Year	28.1422	766,170.1	75.31
Snow Water at Start of Year	3.1020	84,452.5	8.30
Snow Water at End of Year	3.4955	95,164.2	9.35
Annual Water Budget Balance	0.0000	0.0000	0.00

Average Annual Totals Summary

Title: WPC-Ore Pad Liner
Simulated on: 4/1/2026 23:24

	Average Annual Totals for Years 1 - 5*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	37.69	[5.35]	1,026,055.8	100.00
Runoff	0.000	[0]	0.0000	0.00
Evapotranspiration	8.158	[1.468]	222,094.5	21.65
Subprofile1				
Lateral drainage collected from Layer 3	29.6059	[6.6724]	806,020.7	78.56
Percolation/leakage through Layer 5	0.000022	[0.000005]	0.6084	0.00
Average Head on Top of Layer 4	0.4771	[0.1076]	---	---
Subprofile2				
Lateral drainage collected from Layer 6	0.0000	[0]	0.0108	0.00
Percolation/leakage through Layer 7	0.000022	[0.000005]	0.5976	0.00
Average Head on Top of Layer 7	0.0000	[0]	---	---
Water storage				
Change in water storage	-0.0757	[1.4673]	-2,059.9	-0.20

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: WPC-Ore Pad Liner
Simulated on: 4/1/2026 23:25

	Peak Values for Years 1 - 5*		
	(inches)		(cubic feet)
Precipitation	4.09		111,350.3
Runoff	0.000		0.0000
Subprofile1			
Drainage collected from Layer 3	0.5877		15,999.9
Percolation/leakage through Layer 5	0.000000		0.0128
Average head on Layer 4	3.4586		---
Maximum head on Layer 4	6.0345		---
Location of maximum head in Layer 3	38.04	(feet from drain)	
Subprofile2			
Drainage collected from Layer 6	0.0000		0.0005
Percolation/leakage through Layer 7	0.000000		0.0123
Average head on Layer 7	0.0000		---
Maximum head on Layer 7	0.0000		---
Location of maximum head in Layer 6	0.00	(feet from drain)	
Other Parameters			
Snow water	11.5390		314,147.9
Maximum vegetation soil water	0.3970	(vol/vol)	
Minimum vegetation soil water	0.0130	(vol/vol)	

Final Water Storage in Landfill Profile at End of Simulation Period

Title: WPC-Ore Pad Liner
Simulated on: 4/1/2026 23:25
Simulation period: 5 years

	Final Water Storage	
Layer	(inches)	(vol/vol)
1	24.5983	0.0695
2	1.8227	0.0759
3	1.4172	0.0591
4	0.0000	0.0000
5	0.3000	0.7500
6	0.0020	0.0100
7	0.0000	0.0000
Snow water	3.4955	---

Appendix F

Environmental Monitoring Plan

Environmental Monitoring Plan

White Pine North Project



White Pine Copper LLC

White Pine, Michigan

August 2026

Project ID: 23W200

Solving our clients' toughest science and engineering challenges.

Environmental Monitoring Plan
White Pine North Project

Project ID: 23W200

Prepared for
White Pine Copper LLC
White Pine, Michigan

Prepared by
Foth Infrastructure & Environment, LLC

August 2026

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Environmental Monitoring Plan
White Pine North

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3 Wetland Hydrologic Monitoring
4 Biological Monitoring
5 Operations Water Monitoring
6 Mine Facilities and Environmental Measures Inspection
7 Post-closure Monitoring

1. Introduction

In conjunction with the Mining Permit Application, White Pine Copper LLC (WPC), a wholly owned subsidiary of Kinterra Copper USA, LLC, has prepared this Environmental Monitoring Plan (EMP) to support the permit application. As part of the permitting process for the proposed project, WPC is required to obtain a Mining Permit pursuant to Part 632, Nonferrous Metallic Mineral Mining, of the Michigan Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended (MCL 324.63201 et seq.), and the associated administrative rules promulgated under R 425.101 et seq. of the Michigan Administrative Code.

This document has been prepared with the following:

- This EMP has been prepared to meet the intent of Part 632 rules R 425.203(g)(i) and R 425.406.

- A Quality Assurance Project Plan (QAPP) has been in place for baseline sampling and will be revised, as needed, with the permitting process.

As monitoring requirements evolve with the Project, this plan will also evolve. To serve the evolution, this document is structured in modules as shown in the Table of Contents. Modules can be modified separately without affecting the document as a whole. The modules are as follows:

Module Plan 1 – Groundwater Monitoring
Module Plan 2 – Surface Water Monitoring
Module Plan 3 – Wetland Monitoring
Module Plan 4 – Biological Monitoring
Module Plan 5 – Operations Monitoring
Module Plan 6 – Mine Facilities Monitoring
Module Plan 7 – Post-Closure Monitoring

Module Plan 1

Groundwater Monitoring

Foth Infrastructure & Environment, LLC

Environmental Monitoring Plan

1 Groundwater Monitoring

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Figures

Figure 1-1 Existing and Proposed to be Abandoned Groundwater Monitoring Wells
Figure 1-2 Proposed Groundwater Monitoring Well Locations

1 Introduction

The groundwater portion of the Environmental Monitoring Plan (EMP) described in this section is designed to meet the requirements of R 425.203(g)(i) and R 425.406(5). This section will describe the groundwater monitoring plan that will start at the beginning of construction:

- Construction – the period of time when construction starts and when mine operations begin.
- Operations – the period of time when the mine is operating, prior to reclamation.

Post-operations groundwater monitoring is detailed in Module 7 of the EMP.

This groundwater monitoring plan includes the following elements:

- Locating and installing groundwater monitoring wells in the vicinity of the Tailings Disposal Facility (TDF), temporary ore stockpile, Mine/Mill Facilities, Contact Water Ponds (CWP) and Underground Mine.
- Monitoring the groundwater quality and elevation in the vicinity of the TDF, Mine/Mill Facilities, and CWPs.
- Establishing background groundwater quality for the TDF and CWPs in proximity to mining activities.
- Assessing data collected from monitoring wells and responding to potential exceedances of action levels.

2 Groundwater Monitoring Well Design and Location Criteria

Groundwater monitoring wells are required by R 425.203(g)(i) and R 425.406(5) to be located at points where mining activities have a potential for measurable impact on groundwater. Existing and proposed monitoring wells for the groundwater portion of the EMP are listed in Table 1-1. This table includes lithologic unit, coordinates, status, purpose of the well, and planned action items. The following sections describe the available wells that are planned to be included in the groundwater monitoring network as well as plans for installing additional monitoring wells.

2.1 Groundwater Monitoring Wells to be Abandoned

Numerous groundwater monitoring wells were installed across the Project Area for various data collection efforts. However, there may be some wells that may be removed due to construction of the mine and related infrastructure, as shown on Figure 1-1. These wells (NB1-1, NB1-3, NB2-1, and NB2-3) will be scheduled for abandonment during the mine's construction phase.

2.2 Groundwater Monitoring Wells to be Installed

To support groundwater monitoring during operations, the monitoring wells shown on Figure 1-2 will be installed. These wells are also listed on Table 1-1.

Leachate Monitoring Wells: R 425.406(5)(a) requires groundwater monitoring wells to be installed downgradient at the limits of each of the TDFs and the CWPs. These wells are referred to as "leachate monitoring wells." Table 1-1 lists the features monitored by each of the existing and proposed leachate wells. The wells are positioned on the downgradient side of the mine feature being monitored.

Compliance Monitoring Wells: R 425.406(5)(b) requires groundwater monitoring wells to be installed within 150 feet (46 meters) of the facility limits, upgradient and downgradient of the Mine Waste Storage Areas (TDFs and ore stockpiles), Contact Water Ponds, and the Mine/Mill Facilities. The proposed groundwater compliance monitoring wells and facility infrastructure are illustrated on Figure 1-2. Some existing monitoring wells will be utilized as part of the compliance/leachate network, as indicated. Table 1-1 lists the features monitored by each of the existing and proposed compliance wells.

Monitoring Well Installation Requirements: Monitoring wells will be constructed in accordance with the Michigan Department of Environment, Great Lakes, and Energy (EGLE) regulations R 323.2223(4) using 10-foot (3.05 meter) screens with 2 feet of the screened interval placed above the normal water table. Monitoring well screens will be constructed of nominal 2-inch diameter 0.010-inch slot Schedule 40 PVC with matching 2-inch diameter Schedule 40 PVC riser pipe. New wells will be surveyed for elevation and horizontal coordinates once they have been installed. Borehole logs and construction records will be maintained in a database.

Monitoring well development will occur after well installation and will follow standard development procedures.

Installation of monitoring wells will be accomplished at an appropriate time during construction of the facility and prior to mine operations.

2.3 Regional Well Network

The groundwater across the broader regional area will be monitored using existing wells, as shown on Figure 1-1. The regionally extensive monitoring well network was used to collect baseline data prior to permitting and will be utilized for groundwater level and quality monitoring of the regional groundwater.

3 Groundwater Monitoring Plan

This section describes the procedure for monitoring groundwater elevation and quality. This section includes: the list of wells to be monitored, the monitoring frequency, sampling procedures, and the water quality parameter list. The list of wells to be monitored and the frequency of monitoring will differ slightly between the pre-construction, pre-operations, and

operations phases, as recommended in Table 1-2, but the sampling parameters and procedures will be consistent as described in this section.

3.1 Groundwater Elevation Monitoring

The groundwater monitoring wells will be gauged for depth to water in the wells according to the frequency in Table 1-2 according to the procedures for collecting groundwater level measurements data. Figures 1-2 and 1-3 show the leachate, compliance, and regional well locations. Table 1-3 provides monitoring well installation details and an approximate depth to water based on 2025-2026 average measurements. Groundwater level measurements will be recorded to an accuracy of 0.01 feet and be recorded per field log book procedures.

3.2 Groundwater Quality Monitoring

Monitoring wells will be sampled according to the schedule in Table 1-2 for the analytes listed in Table 1-4. Wells will be sampled using low-flow sampling method. During sampling events, the field sampling staff will record the following data during well purging:

- Time/date and monitoring well identification
- Depth to water level below measuring point
- Groundwater quality field parameters
- Lab sample analytes
- Time of each operation: lowering pump, low-flow field parameter monitoring and sample collection
- Well volume estimate and number of gallons purged
- Estimated pumping rate

Well purging will continue until field parameters have stabilized within 3% of the previous reading. All equipment will be decontaminated after developing each well.

The laboratory analytical methods are listed in Table 1-4 along with the Target Detection limits consistent with the Michigan Department of Environmental Quality (MDEQ, 2016) *Target Detection Limits and Designated Analytical Methods,* March 10, 2016.

Groundwater sampling frequency is shown on Table 1-2. Quarterly sampling will be generally scheduled for February, April, August, and October. Site development, site access, and weather may warrant adjustments to this schedule.

4 Quality Assurance/Quality Control

A Quality Assurance Project Plan (QAPP) was prepared in preparation for the baseline groundwater and surface water data collection efforts. The QAPP will be revised and re-submitted, as necessary, and serve as the primary Quality Assurance/Quality Control document for the project's groundwater and surface water monitoring program. The revised QAPP will provide more detailed procedures on quality control sampling, sample handling, and laboratory quality assurance procedures that will be followed.

5 Presentation and Assessment of Groundwater Data

Groundwater data will be assessed during operations for potential impacts that may result from mining activities. Potential impacts to groundwater will be assessed using statistical methods that will include trend analyses of parameter concentrations, and well as statistical comparisons to baseline conditions recorded during the pre-construction phase. Appropriate parametric and nonparametric statistical methods will be used with consideration of percentage of non-detect, normality, and one-tailed vs. two-tailed distribution. In addition, sources of variation in the data unrelated to site activities, such as temporal/seasonal and spatial variation, will be statistically estimated and evaluated. Statistical analysis will be performed according to the following guidance documents:

- Michigan Department of Environmental Quality, 2002. Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.
- Gilbert, R.O., 1987. Statistical Methods for Environmental Pollution Monitoring, Van Nostrand Reinhold, New York.
- U.S. Environmental Protection Agency, 2000. Practical Methods for Data Analysis-EPA QA/G-9, EPA/600/R-96/084.

6 Reporting

Reporting shall be conducted in a timely manner to support ongoing field data collection and the effective evaluation of monitoring data.

A summary of groundwater monitoring data and analyses will be included in the annual mining and reclamation report.

7 Notification of Exceedances

As stipulated in Michigan Administrative Code R. 425.406(6), EGLE will be notified if sampling of leachate or compliance wells detects concentrations of a solute two standard deviations above the long-term average background level for two consecutive sampling events. An increased monitoring program may be implemented at the direction of EGLE.

If an action level is reached, as defined in Section 8, an increased monitoring program will be implemented at the direction of EGLE. A plan for response activity will be submitted to EGLE for approval in a timely manner.

8 Use of Action Levels

In accordance with Mich. Admin. Code R. 425.406(7), an action level is reached at such time as sampling of leachate monitoring wells and compliance monitoring wells detects either of the following:

- Concentrations of a solute that equal or exceed half the level between the long-term average background and the drinking water standard for two consecutive sampling events.
- Concentrations of hydrogen ion, expressed as pH, that differ from the long-term average background by 0.5 units or more for two consecutive sampling events.

When an action level is reached, response protocols will be initiated with increased monitoring directed by an approved assessment monitoring plan. The results of the assessment monitoring will be evaluated to determine the nature and extent of the original action level exceedance. Should additional information be required, further investigation will be conducted to determine the cause of the change in water quality. These findings will be summarized in an assessment monitoring report that will be provided to EGLE. A corrective action plan (i.e., response activities) prepared in response to the recommendations in the assessment monitoring report will be submitted in a timely manner to EGLE for approval. If the change in water quality is determined by EGLE to be caused by a release associated with a mining activity, corrective actions (or response activities) will be implemented.

9 References

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Tables

Table 1-1
Identification of Groundwater Monitoring Wells and Piezometers
White Pine Copper LLC

Well	Well Type	Location		Monitored Unit	Area
		Northing	Easting		
		NAD83 16N	NAD83 16N		
MW-1AR [1]	Compliance Well / Leachate Well	5186625.77	305242.37	Unconsolidated Deposits	Tailings Basin Area
MW-1BR [1]	Compliance Well / Leachate Well	5186627.38	305240.60	Shallow Bedrock	Tailings Basin Area
MW-2A [1]	Compliance Well / Leachate Well	5186789.10	306366.45	Unconsolidated Deposits	Tailings Basin Area
MW-2B [1]	Compliance Well / Leachate Well	5186789.83	306364.80	Unconsolidated Deposits	Tailings Basin Area
MW-2SB [1]	Compliance Well / Leachate Well	5186787.00	306365.61	Shallow Bedrock	Tailings Basin Area
MW-3A [1]	Compliance Well / Leachate Well	5187052.24	307378.87	Unconsolidated Deposits	Tailings Basin Area
MW-3B [1]	Compliance Well / Leachate Well	5187052.22	307377.52	Unconsolidated Deposits	Tailings Basin Area
MW-5A [1]	Compliance Well / Leachate Well	5186656.92	309855.56	Unconsolidated Deposits	Tailings Basin Area
MW-5SB [1]	Compliance Well / Leachate Well	5186656.92	309855.56	Shallow Bedrock	Northeast of Tailings
MW-10 [1]	Compliance Well / Leachate Well	5187037.15	308374.65	Unconsolidated Deposits	Tailings Basin Area
MW-18 [2]	Compliance Well	5183298.98	304273.84	Unconsolidated Deposits	Proposed CWP
MW-31	Downgradient / Compliance Well	5183631.22	304173.70	Unconsolidated Deposits	Contact Water Pond
MW-35	Downgradient	5187846.42	305141.86	Unconsolidated Deposits	North of Tailings
MW-35SB	Downgradient	5187491.77	304921.03	Shallow Bedrock	North of Tailings
MW-36	Downgradient / Compliance Well	5187293.78	307076.98	Shallow Bedrock	Tailings Basin Area
MW-37	Downgradient	5188025.17	307662.46	Unconsolidated Deposits	Tailings Basin Area
MW-38	Downgradient	5188048.14	309179.35	Shallow Bedrock	Tailings Basin Area
MW-41	Downgradient / Compliance Well	5187711.27	307310.16	Shallow Bedrock	Tailings Basin Area
MW-42	Downgradient / Compliance Well	5187571.08	309064.36	Shallow Bedrock	Tailings Basin Area
MW-43	Over Eastern Underground Mine	5184183.10	311075.10	Unconsolidated Deposits	East of tailings
MW-43SB	Over Eastern Underground Mine	5184457.13	309559.33	Shallow Bedrock	East of tailings
MW-44	Upgradient	5181948.50	311129.60	Unconsolidated Deposits	East of tailings
NB1-1		5183703.95	306303.39	Tailings	Tailings Basin
NB1-3		5183704.89	306297.30	Tailings	Tailings Basin
NB2-1		5185068.64	305689.43	Tailings	Tailings Basin
NB2-3		5185063.84	305693.43	Tailings	Tailings Basin
SMW-1	Compliance Well	5184546.06	304381.08	Unconsolidated Deposits	West of Tailings
SMW-1SB	Compliance Well	5184551.15	304376.57	Shallow Bedrock	West of Tailings
SMW-3	Upgradient	5175982.46	306684.84	Unconsolidated Deposits	Upgradient of Mine site
SMW-3SB	Upgradient	5175962.10	306679.47	Shallow Bedrock	Upgradient of Mine site
MW-45 - Proposed	Compliance Well	TBD	TBD	Unconsolidated Deposits	Proposed CWP / Facility Pt
MW-46 - Proposed	Compliance Well	TBD	TBD	Unconsolidated Deposits	Proposed CWP
MW-47 - Proposed	Compliance Well	TBD	TBD	Unconsolidated Deposits	Proposed Ore Stockpile

Table 1-1 (continued)

Well	Well Type	Location		Monitored Unit	Area
		Northing	Easting		
		NAD83 16N	NAD83 16N		
MW-48 - Proposed	Compliance Well	TBD	TBD	Unconsolidated Deposits	Proposed Ore Stockpile
MW-49 - Proposed	Compliance Well	TBD	TBD	Unconsolidated Deposits	Proposed Ore Stockpile
MW-50 - Proposed	Compliance Well	TBD	TBD	Unconsolidated Deposits	Proposed CWP

Notes:

Prepared by: NMG1

Checked by: HLH

[1] Locations are classified as affected in the Consent Decree / Remedial Action Plan.

[2] Location already included in legacy monitoring program.

TBD = To Be Determined

CWP = Contact Water Pond

Table 1-2
Groundwater Monitoring and Sampling Locations
White Pine Copper LLC

	Construction		Operations	
Well ID	Groundwater Elevation Frequency	Water Quality Sampling Frequency	Groundwater Elevation Frequency	Water Quality Sampling Frequency
Monitoring Wells				
MW-1AR	Quarterly	Quarterly	Quarterly	Quarterly
MW-1BR	Quarterly	Quarterly	Quarterly	Quarterly
MW-2A	Quarterly	Quarterly	Quarterly	Quarterly
MW-2B	Quarterly	Quarterly	Quarterly	Quarterly
MW-2SB	Quarterly	Quarterly	Quarterly	Quarterly
MW-3A	Quarterly	Quarterly	Quarterly	Quarterly
MW-3B	Quarterly	Quarterly	Quarterly	Quarterly
MW-5A	Quarterly	Quarterly	Quarterly	Quarterly
MW-5SB	Quarterly	Quarterly	Quarterly	Quarterly
MW-10	Quarterly	Quarterly	Quarterly	Quarterly
MW-18	Quarterly	Quarterly	Quarterly	Quarterly
MW-31	Quarterly	Quarterly	Quarterly	Quarterly
MW-35	Quarterly	Quarterly	Quarterly	Quarterly
MW-35SB	Quarterly	Quarterly	Quarterly	Quarterly
MW-36	Quarterly	Quarterly	Quarterly	Quarterly
MW-37	Quarterly	Quarterly	Quarterly	Quarterly
MW-38	Quarterly	Quarterly	Quarterly	Quarterly
MW-41	Quarterly	Quarterly	Quarterly	Quarterly
MW-42	Quarterly	Quarterly	Quarterly	Quarterly
MW-43	Quarterly	Quarterly	Quarterly	Quarterly
MW-43SB	Quarterly	Quarterly	Quarterly	Quarterly
MW-44	Quarterly	Quarterly	Quarterly	Quarterly
SMW-1	Quarterly	Quarterly	Quarterly	Quarterly
SMW-1SB	Quarterly	Quarterly	Quarterly	Quarterly
SMW-3	Quarterly	Quarterly	Quarterly	Quarterly
SMW-3SB	Quarterly	Quarterly	Quarterly	Quarterly
MW-45 - Proposed	Quarterly	Quarterly	Quarterly	Quarterly
MW-46 - Proposed	Quarterly	Quarterly	Quarterly	Quarterly
MW-47 - Proposed	Quarterly	Quarterly	Quarterly	Quarterly
MW-48 - Proposed	Quarterly	Quarterly	Quarterly	Quarterly
MW-49 - Proposed	Quarterly	Quarterly	Quarterly	Quarterly
MW-50 - Proposed	Quarterly	Quarterly	Quarterly	Quarterly

Prepared by: NMG1
Checked by: HLH

Table 1-3
Monitoring Well Detail and Groundwater Elevation Summary
White Pine Copper LLC

Well	Date Installed	Location		Top of Casing (Collar) Elevation	Ground Surface Elevation	Depth to Bedrock (NE=not encountered)	Well Depth / Bot. of Borehole	Screened Interval		Average Depth to Groundwater (from 2025-2026 monitoring)	Monitored Unit	Casing Diameter	Well Useage	Area
		Northing	Easting					From	To					
		NAD83 16N	NAD83 16N	Ft NAVD88	Ft NAVD88	(ft BGS)	(ft BGS)	(ft BGS)	(ft BGS)	(ft BTOC)		(inches)		
MW-1AR	8/26/2006	5186625.77	305242.37	722.81	720.3	23.0	24.0	12.0	22.6	10.6	Unconsolidated Deposits	2	632 Baseline	Tailings Basin Area
MW-1BR	8/26/2006	5186627.38	305240.60	721.23	719.2	23.0	30	25.5	30.0	10.8	Shallow Bedrock	2	632 Baseline	Tailings Basin Area
MW-2A	3/17/1993	5186789.10	306366.45	723.45	721.4	15.0	30	20.0	30.0	7.3	Unconsolidated Deposits	3	632 Baseline	Tailings Basin Area
MW-2B	3/17/1993	5186789.83	306364.80	723.10	720.7	12.0	16	6.0	16.0	6.9	Unconsolidated Deposits	3	632 Baseline	Tailings Basin Area
MW-2SB	12/17/2024	5186787.00	306365.61	726.08	723.7	12.0	91.7	58.9	88.9	83.6	Shallow Bedrock	2	632 Baseline	Tailings Basin Area
MW-3A	3/17/1993	5187052.24	307378.87	730.26	727.7	12.0	30	20.0	30.0	7.3	Unconsolidated Deposits	3	632 Baseline	Tailings Basin Area
MW-3B	3/17/1993	5187052.22	307377.52	729.13	727.3	NE	15	4.0	14.0	6.8	Unconsolidated Deposits	3	632 Baseline	Tailings Basin Area
MW-5	10/17/1995	5186656.92	309855.56	721.60	NA	NE	30.0	20.0	30.0	NA	Unconsolidated Deposits	3	631 Baseline	Tailings Basin Area
MW-5A	3/17/1993	5186656.92	309855.56	717.47	715.0	10.0	30.0	20.0	30.0	5.6	Unconsolidated Deposits	3	632 Baseline	Tailings Basin Area
MW-5SB	9/30/2024	5186656.92	309855.56	721.13	718.5	12.0	123.8	74.9	104.4	0.0	Shallow Bedrock	2	632 Baseline	Northeast of Tailings
MW-10	6/26/1997	5187037.15	308374.65	741.71	739.0	NE	20.0	10.0	20.0	5.2	Unconsolidated Deposits	2	632 Baseline	Tailings Basin Area
MW-18	6/20/1997	5183298.98	304273.84	837.70	834.7	NE	60.0	50.0	60.0	NA	Unconsolidated Deposits	2	Sentry	Bedell Pond
MW-19R	10/26/2006	5182113.22	304325.39	870.10	867.2	NE	21.0	10.0	20.0	NA	Unconsolidated Deposits	2	Sentry	Main Facilities Area
MW-23	6/30/1997	5182292.42	303804.51	865.78	863.5	75.0	75.0	64.0	74.0	NA	Unconsolidated Deposits	2	Sentry	MFA, Historic Barrel Dump
MW-30	7/28/1998	5183422.64	304128.90	835.50	833.3	79.0	79.5	69.5	79.5	NA	OB / BR Interface	2	Sentry	Bedell Pond
MW-31	7/31/1998	5183631.22	304173.70	829.50	826.7	71.0	71.0	60.0	70.0	50.7	Unconsolidated Deposits	2	632 Baseline / Sentry	Bedell Pond
MW-32	8/12/1998	5183491.48	303892.82	819.68	817.3	NE	63.0	52.5	62.5	NA	Unconsolidated Deposits	2	Sentry	Bedell Pond
MW-35	8/3/1998	5187846.42	305141.86	680.39	677.8	20.0	20.0	9.5	19.5	17.5	Unconsolidated Deposits	2	632 Baseline	North of Tailings
MW-35SB	12/17/2024	5187491.77	304921.03	699.11	696.7	31.0	119.5	60.4	109.8	20.1	Shallow Bedrock	2	632 Baseline	North of Tailings
MW-36	8/1/1998	5187293.78	307076.98	719.73	717.2	2.0	18.0	5.0	15.0	3.4	Shallow Bedrock	2	Sentry	Tailings Basin Area
MW-37	8/11/1998	5188025.17	307662.46	718.28	715.8	NE	20.0	9.0	19.0	13.1	Unconsolidated Deposits	2	632 Baseline	Tailings Basin Area
MW-38	7/31/1998	5188048.14	309179.35	698.46	696.1	3.0	30.0	17.7	27.7	10.4	Shallow Bedrock	2	632 Baseline	Tailings Basin Area
MW-41	10/26/2006	5187711.27	307310.16	704.79	702.8	10.0	30.0	17.5	26.5	26.0	Shallow Bedrock	2	Sentry	Tailings Basin Area
MW-42	8/26/2006	5187571.08	309064.36	719.00	717.3	10.0	30.0	17.5	26.5	5.1	Shallow Bedrock	2	Sentry	Tailings Basin Area
MW-43	9/28/2014	5184183.10	311075.10	787.2	784.7*	22.0	42.0	15.0	25.0	11.6	OB / BR Interface	2	632 Baseline	East of tailings
MW-43SB	10/1/2024	5184457.13	309559.33	790.29	787.5	20.0	145.4	109.0	139.7	7.0	Shallow Bedrock	2	632 Baseline	East of tailings
MW-44	9/30/2014	5181948.50	311129.60	850.2	847.7*	35.4	56.0	20.0	30.0	14.9	Unconsolidated Deposits	2	632 Baseline	East of tailings
MW-PRB1	8/10/1998	5182879.16	303797.46	854.96	852.2	75.5	82.0	72.0	82.0	NA	Shallow Bedrock	2	Sentry	On-Site Repository
MW-R2	7/27/1999	5182850.81	303910.62	843.19	840.1	57.0	69.0	59.0	69.0	NA	Shallow Bedrock	2	Sentry	On-Site Repository
MW-R3	5/9/2000	5182749.47	303797.93	852.04	850.0	79.0	79.0	69.0	79.0	NA	Unconsolidated Deposits	2	Sentry	On-Site Repository
MW-R4	5/9/2000	5182647.62	303988.37	863.83	861.5	81.0	81.0	71.0	81.0	NA	Unconsolidated Deposits	2	Sentry	On-Site Repository
NB1-1	8/1/1997	5183703.95	306303.39	852.10	850.0	NE	14.0	6.0	14.0	3.7	Tailings	3	632 Baseline	Tailings Basin
NB1-2	8/1/1997	5183699.22	306299.11	852.25	850.2	NE	23.1	13.1	23.1	NA	Tailings	3		Tailings Basin
NB1-3	8/1/1997	5183704.89	306297.30	852.00	849.7	NE	32.6	22.6	32.6	4.0	Tailings	3	632 Baseline	Tailings Basin
NB2-1	8/1/1997	5185068.64	305689.43	800.34	797.8	NE	10.1	5.1	10.1	3.9	Tailings	3	632 Baseline	Tailings Basin
NB2-2	7/15/1997	5185068.66	305696.42	800.01	797.3	NE	19.0	9.0	19.0	NA	Tailings	3		Tailings Basin
NB2-3	8/1/1997	5185063.84	305693.43	799.49	797.0	NE	28.1	18.1	28.1	3.6	Tailings	3	632 Baseline	Tailings Basin
SMW-1	2/18/1994	5184546.06	304381.08	788.95	787.8	NE	35.7	25.5	35.7	24.4	Unconsolidated Deposits	3	632 Baseline	West of Tailings
SMW-1SB	12/9/2024	5184551.15	304376.57	787.89	785.4	37.5	130.8	70.0	129.6	24.6	Shallow Bedrock	2	632 Baseline	West of Tailings
SMW-3	2/1/1994	5175982.46	306684.84	1070.30	1068.7	50.0	75.0	40.0	55.0	27.0	Unconsolidated Deposits	3	632 Baseline	Upgradient of Mine site
SMW-3SB	12/4/2024	5175962.10	306679.47	1069.62	1067.3	74.5	151.1	89.9	140.0	22.8	Shallow Bedrock	2	632 Baseline	Upgradient of Mine site

Notes:
ft BTOC = ft below top of casing
NE = not encountered
FT NAVD88 = Feet above North America Vertical Datum of 1988
ft bgs = feet below ground surface
NAD83 16N = Universal Transverse Mercator (UTM) Zone 16 North; North America Datum of 1983
The top of casing (measurement point) elevation is inferred for wells MW-43 and MW-44 based ground surface in Leapfrog Model (plus 2.5-foot stick-up).
NA = not available
Gray = Wells to be abandoned

Prepared by: NMG1
Checked by: HLH

Table 1-4
Groundwater Sampling Parameters
White Pine Copper LLC

Analyte	Method	Targeted Method Detection Limit	Units	Container and Sample Volume	Preservation	Hold Time
Field Parameters						
Dissolved Oxygen	Field	--	mg/L	--	--	--
Oxidation Reduction Potential	Field	--	mV	--	--	--
pH	Field	--	S.U.	--	--	--
Specific Conductance	Field	--	µmhos/cm	--	--	--
Temperature	Field	--	ºC	--	--	--
Turbidity	Field	--	NTU	--	--	--
General Parameters						
Ammonia (un-ionized as N)	350.1	0.1	mg/L	Plastic - 250mL	0-6°C	NA
Alkalinity, Total	2320B	3.74	mg/L	Plastic - 250mL	0-6°C	14 days
Alkalinity, Bicarbonate as CaCO3	2320B	3.74	mg/L	Plastic - 250mL	0-6°C	14 days
Alkalinity, Carbonate as CaCO3	2320B	3.74	mg/L	Plastic - 250mL	0-6°C	14 days
Bromide	300_28D	0.2	mg/L	Plastic - 500mL	0-6°C	28 days
Chloride	300_28D	0.1	mg/L	Plastic - 500mL	0-6°C	28 days
Cyanide, Total	335.4	NA	NA	Plastic - 250mL	Sodium Hydroxide, 0-6°C	
Dissolved Organic Carbon	5310	0.47	mg/L	2x VOA vials - 40mL	Sulfuric acid, 0-6°C	28 days
Total Organic Carbon	5310	0.47		2x VOA vials - 40mL	Sulfuric acid, 0-6°C	28 days
Fluoride	300_28D	0.2	mg/L	Plastic - 500mL	0-6°C	28 days
Hardness (Ca+Mg)	2340B	0.46	mg/L	Plastic - 250mL	nitric acid	180 days
Nitrate (as N)	300_48Hr	0.37	mg/L	Plastic - 500mL	0-6°C	48 hours
Nitrite (as N)	300_48Hr	0.1	mg/L	Plastic - 500mL	0-6°C	48 hours
Nitrate + Nitrite (as N)	300_48Hr	0.1	mg/L	Plastic - 500mL	0-6°C	48 hours
Phosphorus, total	365.1	0.239	mg/L	Plastic - 500mL	Sulfuric acid, 0-6°C	28 days
Sulfate	300_28D	0.2	mg/L	Plastic - 500mL	0-6°C	28 days
Sulfide	SM4500_S2_F	0.231	mg/L	Plastic - 500mL	Zn acetate & NaOH	7 days
Total Dissolved Solids (TDS)	2540C	4.34	mg/L	Plastic - 500mL	0-6°C	7 days

Table 1-4 (continued)

Analyte	Method	Targeted Method Detection Limit	Units	Container and Sample Volume	Preservation	Hold Time
Total Salinity	2520B	0.33	psu	Plastic - 250mL	0-6°C	NA
Total Suspended Solids (TSS)	2540D	1.93	mg/L	Plastic - 1L	0-6°C	7 days
Metals (Total & Dissolved)						
Aluminum	6020B	24.6	µg/L	Plastic - 250mL	Nitric acid	180 days
Antimony	6020B	1.32	µg/L	Plastic - 250mL	Nitric acid	180 days
Arsenic	6020B	0.232	µg/L	Plastic - 250mL	Nitric acid	180 days
Barium	6020B	0.73	µg/L	Plastic - 250mL	Nitric acid	180 days
Beryllium	6020B	0.53	µg/L	Plastic - 250mL	Nitric acid	180 days
Boron	6020B	12.7	µg/L	Plastic - 250mL	Nitric acid	180 days
Cadmium	6020B	0.167	µg/L	Plastic - 250mL	Nitric acid	180 days
Calcium	6020B	0.1	mg/L	Plastic - 250mL	Nitric acid	180 days
Chromium (total)	6020B	1.14	µg/L	Plastic - 250mL	Nitric acid	180 days
Cobalt	6020B	0.402	µg/L	Plastic - 250mL	Nitric acid	180 days
Copper	6020B	0.497	µg/L	Plastic - 250mL	Nitric acid	180 days
Iron	6020B	46.7	µg/L	Plastic - 250mL	Nitric acid	180 days
Lead	6020B	0.186	µg/L	Plastic - 250mL	Nitric acid	180 days
Lithium	6020B	2.5	µg/L	Plastic - 250mL	Nitric acid	180 days
Manganese	6020B	0.791	µg/L	Plastic - 250mL	Nitric acid	180 days
Magnesium	6020B	49.4	µg/L	Plastic - 250mL	Nitric acid	180 days
Mercury, Low Level	1631E	0.2 ng/L	ng/L	LLHg kit, 2x VOA vials - 40mL	0-6°C	28 days
Methyl Mercury	1630ME	0.2 ng/L	ng/L	Glass - 250mL	HCL	
Molybdenum	6020B	2.46	µg/L	Plastic - 250mL	Nitric acid	180 days
Nickel	6020B	0.625	µg/L	Plastic - 250mL	Nitric acid	180 days
Potassium	6020B	111	µg/L	Plastic - 250mL	Nitric acid	180 days
Selenium	6020B	0.982	µg/L	Plastic - 250mL	Nitric acid	180 days
Silver	6020B	0.115	µg/L	Plastic - 250mL	Nitric acid	180 days
Sodium	6020B	77.3	µg/L	Plastic - 250mL	Nitric acid	180 days
Strontium	6020B	0.637	µg/L	Plastic - 250mL	Nitric acid	180 days
Thallium	6020B	0.57	µg/L	Plastic - 250mL	Nitric acid	180 days
Tin	6020B	1.3	µg/L	Plastic - 250mL	Nitric acid	180 days

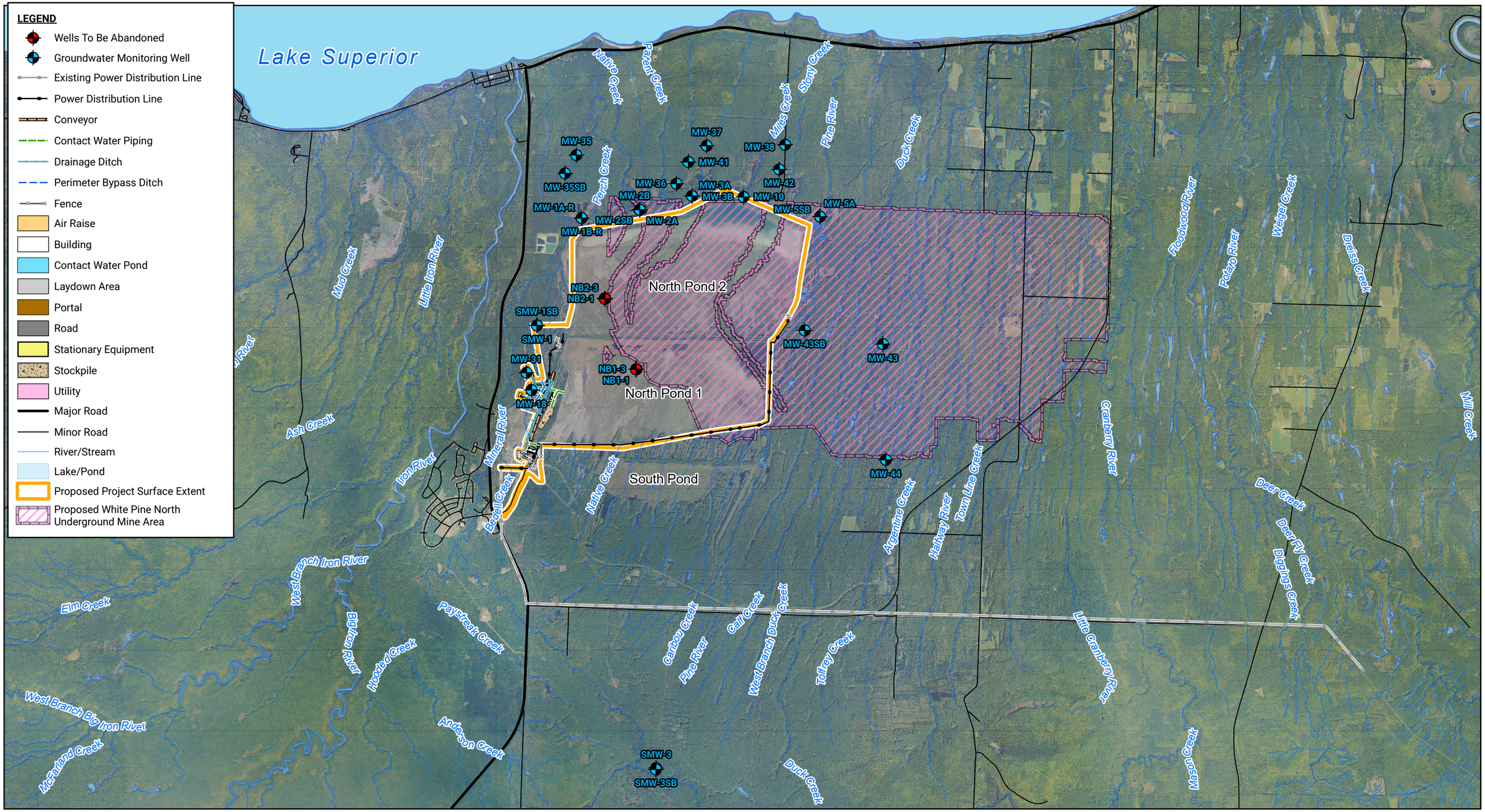
Table 1-4 (continued)

Analyte	Method	Targeted Method Detection Limit	Units	Container and Sample Volume	Preservation	Hold Time
Uranium	6020B	0.0098	µg/L	Plastic - 250mL	Nitric acid	180 days
Vanadium	6020B	2.15	µg/L	Plastic - 250mL	Nitric acid	180 days
Zinc	6020B	6.92	µg/L	Plastic - 250mL	Nitric acid	180 days

Abbreviations:
ºC = degrees Celsius
ASTM = American Society for Testing and Materials
BTEX = benzene, toluene, ethylbenzene and xylene
EPA = United States Environmental Protection Agency
mg/L = milligrams per liter
MSL = above mean sea level
mV = millivolts
NA = not applicable
ng/L = nanograms per liter
NTU = Nephelometric Turbidity Units
pCi/L = picocuries per liter
PCU = platinum-cobalt units
S.U. = standard unit
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter

Prepared by: NMG1
Checked by: Eurofins Lab

Figures



NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.
4. Site layout and infrastructure data from Ausenco, March 2026.

WHITE PINE COPPER

Foth

N

Foth Infrastructure & Environment, LLC

REVISED	DATE	BY	DESCRIPTION

PREPARED BY:	DATE:
REVIEWED BY:	DATE:
APPROVED BY:	DATE:

WHITE PINE COPPER LLC

FIGURE 1-1
EXISTING AND PROPOSED TO BE ABANDONED GROUNDWATER MONITORING WELLS
ENVIRONMENTAL MONITORING PLAN
WHITE PINE NORTH, ONTONAGON COUNTY, MI

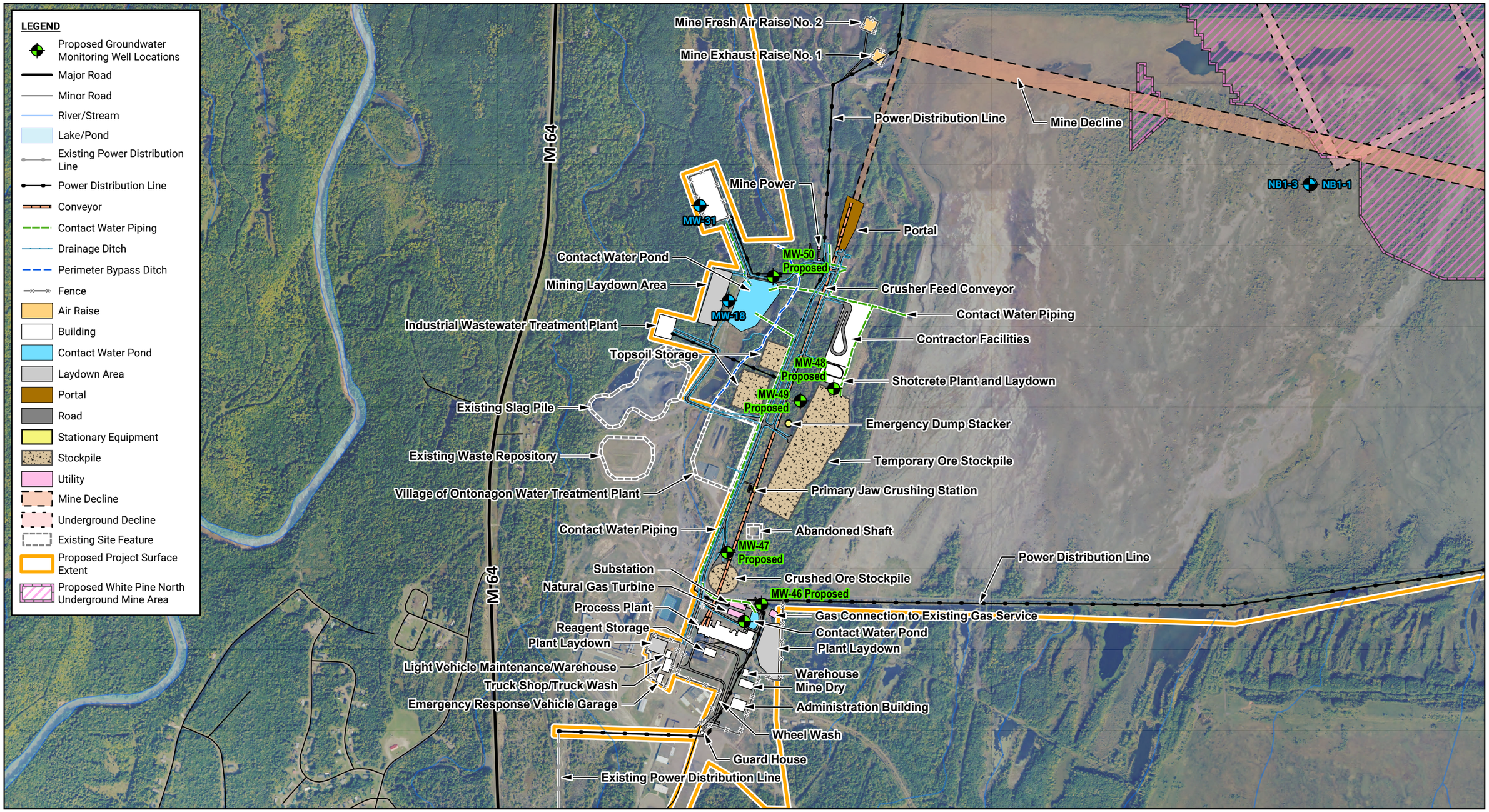
Scale: 0 3,000 6,000 Feet

Date: JULY 2026

Drafted By: DAT

Project: 25W006

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NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.
4. Site layout and infrastructure data from Ausenco, March 2026.

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FIGURE 1-2

PROPOSED GROUNDWATER MONITORING WELL LOCATIONS
ENVIRONMENTAL MONITORING PLAN
WHITE PINE NORTH, ONTONAGON COUNTY, MI

Scale: 0 600 1,200 Feet

Date: JULY 2026

Drafted By: DAT

Project: 25W006

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Module Plan 2

Surface Water Monitoring

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Environmental Monitoring Plan

2 Surface Water Monitoring

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1 Introduction 2
2 Surface Water Monitoring Location Criteria 2
3 Surface Water Sampling Plan 2
3.1 Surface Water Elevation and Flow 2
3.2 Water Quality 2
4 Preconstruction Surface Water Monitoring 3
5 Operations 3
6 Quality Assurance/Quality Control 3
7 Presentation and Evaluation of Surface Water Data 3
8 Reporting 4
9 References 4

Tables

Table 2-1 Surface Water Monitoring Station Locations and Descriptions
Table 2-2 Surface Water Sampling Parameters

Figure

Figure 2-1 Surface Water Monitoring Locations

1 Introduction

Surface water quality monitoring and surface water level monitoring will be completed on streams in the vicinity of the Project Area. This section will describe the surface water monitoring plan for construction and operation phases of the project.

Post-operations surface water monitoring is detailed in Section 7 of the Environmental Monitoring Plan.

2 Surface Water Monitoring Location Criteria

According to R 425.406 (4) surface water monitoring sites shall be designed and located to adequately assess the potential impact of a specific mining activity on surface water. Additional surface water monitoring locations have been added to the plan to evaluate local and regional stream flow and quality. This section describes the hydrologic monitoring that White Pine Copper will implement per the requirements of R 425.203(g) and R 425.406.

Surface water sample locations are located on the streams in proximity to the Underground Mine, Tailings Disposal Facility (TDF), and Mine/Mill facility, as well as upstream and downstream from the Project Area. The stream gauging and sample locations are shown on Figure 2-1 and listed in Table 2-1. The surface water monitoring locations will be assessed on a quarterly basis as required in R 632. The surface water monitoring may be adjusted during the operations phase as necessary to obtain quality data.

3 Surface Water Sampling Plan

This section will describe how surface water elevation, flow and quality will be monitored and compared with baseline monitoring results.

3.1 Surface Water Elevation and Flow

Stage and flow measurements will be taken at streams quarterly at the locations listed in Table 2-1 and shown on Figure 2-1. Stage measurements will be recorded manually from staff gauges installed at the surface water sampling locations where available. Stream flow measurements will be collected manually with a Flow Tracker2 or similar acoustic doppler velocimeter.

3.2 Water Quality

Surface water quality samples will be collected from streams quarterly at the locations indicated in Table 2-1 and on Figure 2-1 according to the parameter list included in Table 2-2. Samples will be collected according to the procedures outlined by the Quality Assurance Project Plan (QAPP). Surface water quality samples will not be collected at stream/river locations when the flow at the time of sampling is at or below the 95% exceedance flow (stagnant) compared to baseline conditions observed during the pre-construction phase, because the data generated may not be an accurate depiction of site conditions. Such events will be marked as not

applicable due to lack of flow and will be sampled in the next sampling event once flow has returned to at least 95%.

The laboratory analytical methods are listed in Table 2-2 for surface water along with the analytical method and Target Detection limits. The list of parameters contained in Table 2-2 is based on baseline studies. This list may be adjusted annually based on actual monitoring results.

4 Preconstruction Surface Water Monitoring

Surface water quality sampling, flow, and stage measurements will be taken quarterly during the construction and operation phases at the locations in Table 2-1 for the parameters listed in Table 2-2.

5 Operations

Surface water quality sampling, flow, and stage measurements will be taken quarterly during the operations at the locations in Table 2-1 for the parameters listed in Table 2-2.

6 Quality Assurance/Quality Control

A QAPP was prepared in preparation for the baseline groundwater and surface water data collection efforts. The QAPP will be revised and re-submitted, as necessary, and serve as the primary Quality Assurance/Quality Control document for the project's groundwater and surface water monitoring program. The revised QAPP will provide more detailed procedures on quality control sampling, sample handling, and laboratory quality assurance procedures that will be followed.

7 Presentation and Evaluation of Surface Water Data

Surface water data will be assessed during operations for distributional changes that may result from mining activities. Statistical methods will include analysis of trends in water chemistry compared to baseline conditions observed during the pre-construction phase. Appropriate parametric and nonparametric statistical methods will be used with consideration of the observed data characteristics (i.e., the distributional form of the data and the number of data points below the detection level). In addition, sources of variation in the data unrelated to site activities, such as seasonality, will be statistically estimated and controlled. Statistical analysis will be performed according to the following guidance documents:

- Michigan Department of Environmental Quality, 2002. Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.
- Gilbert, R.O., 1987. Statistical Methods for Environmental Pollution Monitoring, Van Nostrand Reinhold, New York.

- U.S. Environmental Protection Agency, 2000. Practical Methods for Data Analysis-EPA QA/G-9, EPA/600/R-96/084.

8 Reporting

Reporting shall be conducted in a timely manner to support ongoing field data collection and the effective evaluation of monitoring data. EGLE will be notified in the event monitoring indicates unusual outlier data points or issues of concern.

A summary of surface water monitoring data and analyses will be included in the annual mining and reclamation report.

9 References

Gilbert, R.O., 1987. Statistical Methods for Environmental Pollution Monitoring, Van Nostrand Reinhold, New York.

Michigan Department of Environmental Quality, 2002. Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

U.S. Environmental Protection Agency, 2000. Practical Methods for Data Analysis-EPA QA/G-9, EPA/600/R-96/084.

Tables

Table 2-1
Surface Water Monitoring Station Locations and Descriptions
White Pine Copper LLC

Location	River/Stream Name	Position Relative to Proposed Mine	UTM East	UTM North	Installed Staff Gauge	Continuous Flow Monitor Installed?
ARC-01	Argentine Creek	upgradient	311216.9998	5179165.0000	Yes	No
ARC-02	Argentine Creek	midgradient	312235.0005	5183241.0000	No	No
ARC-03	Argentine Creek	downgradient	313026.9532	5187720.4691	Yes	No
BNC-01	Unnamed pond	downgradient	307731.9261	5187377.9509	No	No
BNW-01	Unnamed pond	downgradient	305327.0000	5186771.0000	No	No
CBR-01	Cranberry River	upgradient	315971.5206	5178800.3013	Yes	Yes
CBR-02	Cranberry River	downgradient	315743.6298	5190016.3351	Yes	Yes
DKC-01	Duck Creek	upgradient	309647.0011	5178892.0000	No	No
DKC-02	Duck Creek	midgradient	311192.9104	5186740.2638	No	No
DKC-03	Duck Creek	downgradient	311739.3494	5189585.7865	No	No
LKS-01	Lake Superior	downgradient	307183.9997	5190257.0001	No	No
LKS-02	Lake Superior	downgradient	309589.0011	5190512.0000	No	No
MLC-01	Miles Creek	downgradient	309213.0264	5189220.9582	No	No
MLR-01	Mineral River	upgradient	304225.1577	5178726.7131	Yes	Yes
MLR-02	Mineral River	midgradient	304808.8235	5185763.0009	Yes	No
MLR-03	Mineral River	downgradient	305329.0008	5188236.0000	Yes	Yes
NTC-01	Native Creek	downgradient	305905.0005	5189332.0000	Yes	No
PNC-01	Pine River	upgradient	307888.9990	5179045.0000	Yes	No
PNC-02	Pine River	midgradient	308949.9986	5182769.0000	Yes	No
PNC-03	Pine River	downgradient	310054.0002	5186867.0000	Yes	No
PNC-04	Pine River	downgradient	310190.8862	5189985.6746	Yes	Yes
PRC-01	Perch Creek	downgradient	305474.0013	5186590.0000	Yes	No
PRC-02	Perch Creek	downgradient	305537.0006	5188208.0000	Yes	No
PTC-01	Patent Creek	downgradient	306549.9986	5189774.0000	No	No
SBD-01	Unnamed pond	upgradient	308433.9988	5181613.0000	No	No
SBW-01	Unnamed pond	upgradient	305785.0006	5181294.0000	No	No

Notes:

Prepared by: NMG1

UTM = Universal Transverse Mercator Coordinate System

Checked by: HLH

Table 2-2
Surface Water Sampling Parameters
White Pine Copper, LLC

Analyte	Method	Targeted Method Detection Limit	Units	Container and Sample Volume	Preservation	Hold Time
Field Parameters						
Dissolved Oxygen	Field	--	mg/L	--	--	--
Oxidation Reduction Potential	Field	--	mV	--	--	--
pH	Field	--	S.U.	--	--	--
Specific Conductance	Field	--	umhos/cm	--	--	--
Temperature	Field	--	°C	--	--	--
Turbidity	Field	--	NTU	--	--	--
General Parameters						
Ammonia (un-ionized as N)	350.1	0.1	mg/L	Plastic - 250mL	0-6°C	NA
Alkalinity, Total	2320B	3.74	mg/L	Plastic - 250mL	0-6°C	14 days
Alkalinity, Bicarbonate as CaCO3	2320B	3.74	mg/L	Plastic - 250mL	0-6°C	14 days
Alkalinity, Carbonate as CaCO3	2320B	3.74	mg/L	Plastic - 250mL	0-6°C	14 days
Bromide	300_28D	0.2	mg/L	Plastic - 500mL	0-6°C	28 days
Chloride	300_28D	0.1	mg/L	Plastic - 500mL	0-6°C	28 days
Cyanide, Total	335.4	NA	NA	Plastic - 250mL	Sodium Hydroxide, 0-6°C	
Dissolved Organic Carbon	5310	0.47	mg/L	2x VOA vials - 40mL	Sulfuric acid, 0-6°C	28 days
Total Organic Carbon	5310	0.47	mg/L	2x VOA vials - 40mL	Sulfuric acid, 0-6°C	28 days
Fluoride	300_28D	0.2	mg/L	Plastic - 500mL	0-6°C	28 days
Hardness (Ca+Mg)	2340B	0.46	mg/L	Plastic - 250mL	nitric acid	180 days
Nitrate (as N)	300_48Hr	0.37	mg/L	Plastic - 500mL	0-6°C	48 hours
Nitrite (as N)	300_48Hr	0.1	mg/L	Plastic - 500mL	0-6°C	48 hours
Nitrate + Nitrite (as N)	300_48Hr	0.1	mg/L	Plastic - 500mL	0-6°C	48 hours
Phosphorus, total	365.1	0.239	mg/L	Plastic - 500mL	Sulfuric acid, 0-6°C	28 days
Sulfate	300_28D	0.2	mg/L	Plastic - 500mL	0-6°C	28 days
Sulfide	SM4500_S2_F	0.231	mg/L	Plastic - 500mL	Zn acetate & NaOH	7 days
Total Dissolved Solids (TDS)	2540C	4.34	mg/L	Plastic - 500mL	0-6°C	7 days
Total Salinity	2520B	0.33	psu	Plastic - 250mL	0-6°C	NA
Total Suspended Solids (TSS)	2540D	1.93	mg/L	Plastic - 1L	0-6°C	7 days
Metals (Total & Dissolved)						
Aluminum	6020B	24.6	µg/L	Plastic - 250mL	Nitric acid	180 days
Antimony	6020B	1.32	µg/L	Plastic - 250mL	Nitric acid	180 days
Arsenic	6020B	0.232	µg/L	Plastic - 250mL	Nitric acid	180 days
Barium	6020B	0.73	µg/L	Plastic - 250mL	Nitric acid	180 days
Beryllium	6020B	0.53	µg/L	Plastic - 250mL	Nitric acid	180 days
Boron	6020B	12.7	µg/L	Plastic - 250mL	Nitric acid	180 days
Cadmium	6020B	0.167	µg/L	Plastic - 250mL	Nitric acid	180 days
Calcium	6020B	0.1	mg/L	Plastic - 250mL	Nitric acid	180 days
Chromium (total)	6020B	1.14	µg/L	Plastic - 250mL	Nitric acid	180 days
Cobalt	6020B	0.402	µg/L	Plastic - 250mL	Nitric acid	180 days
Copper	6020B	0.497	µg/L	Plastic - 250mL	Nitric acid	180 days
Iron	6020B	46.7	µg/L	Plastic - 250mL	Nitric acid	180 days
Lead	6020B	0.186	µg/L	Plastic - 250mL	Nitric acid	180 days
Lithium	6020B	2.5	µg/L	Plastic - 250mL	Nitric acid	180 days
Manganese	6020B	0.791	µg/L	Plastic - 250mL	Nitric acid	180 days
Magnesium	6020B	49.4	µg/L	Plastic - 250mL	Nitric acid	180 days
Mercury, Low Level	1631E	0.2 ng/L	ng/L	LLHg kit, 2x VOA vials - 40mL	0-6°C	28 days
Methyl Mercury	1630ME	0.2 ng/L	ng/L	Glass - 250mL	HCL	
Molybdenum	6020B	2.46	µg/L	Plastic - 250mL	Nitric acid	180 days
Nickel	6020B	0.625	µg/L	Plastic - 250mL	Nitric acid	180 days
Potassium	6020B	111	µg/L	Plastic - 250mL	Nitric acid	180 days
Selenium	6020B	0.982	µg/L	Plastic - 250mL	Nitric acid	180 days
Silver	6020B	0.115	µg/L	Plastic - 250mL	Nitric acid	180 days
Sodium	6020B	77.3	µg/L	Plastic - 250mL	Nitric acid	180 days
Strontium	6020B	0.637	µg/L	Plastic - 250mL	Nitric acid	180 days

Table 2-2 (continued)

Analyte	Method	Targeted Method Detection Limit	Units	Container and Sample Volume	Preservation	Hold Time
Thallium	6020B	0.57	µg/L	Plastic - 250mL	Nitric acid	180 days
Tin	6020B	1.3	µg/L	Plastic - 250mL	Nitric acid	180 days
Uranium	6020B	0.0098	µg/L	Plastic - 250mL	Nitric acid	180 days
Vanadium	6020B	2.15	µg/L	Plastic - 250mL	Nitric acid	180 days
Zinc	6020B	6.92	g/L	Plastic - 250mL	Nitric acid	180 days

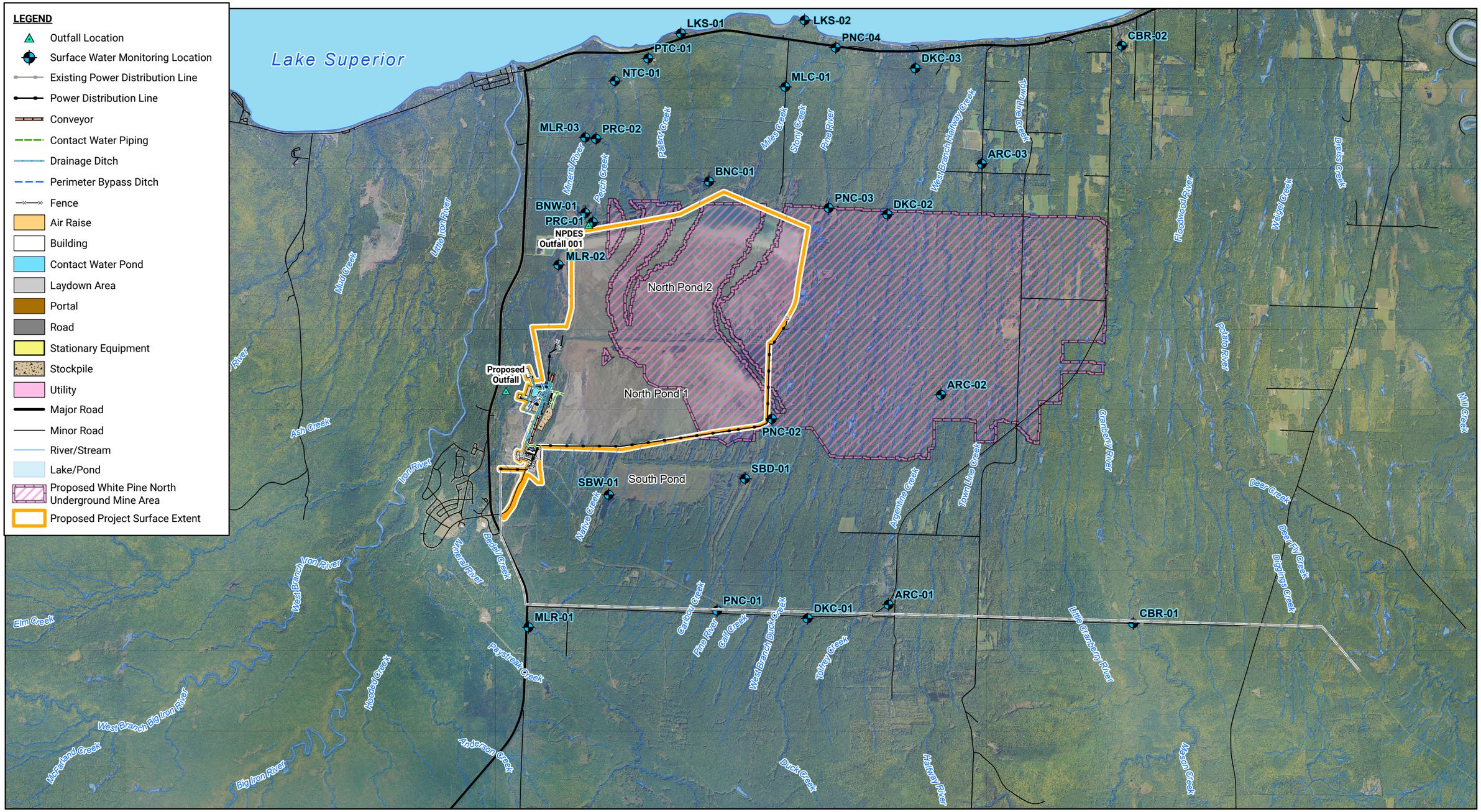
Abbreviations:
ºC = degrees Celsius
ASTM = American Society for Testing and Materials
BTEX = benzene, toluene, ethylbenzene and xylene
EPA = United States Environmental Protection Agency
mg/L = milligrams per liter
MSL = above mean sea level
mV = millivolts
NA = not applicable
ng/L = nanograms per liter
NTU = Nephelometric Turbidity Units
pCi/L = picocuries per liter
PCU = platinum-cobalt units
S.U. = standard unit
µg/L = micrograms per liter
umhos/cm = micromhos per centimeter

Prepared by: NMG1
Checked by: Eurofins Lab

Figure

LEGEND

- Outfall Location
- Surface Water Monitoring Location
- Existing Power Distribution Line
- Power Distribution Line
- Conveyor
- Contact Water Piping
- Drainage Ditch
- Perimeter Bypass Ditch
- Fence
- Air Raise
- Building
- Contact Water Pond
- Laydown Area
- Portal
- Road
- Stationary Equipment
- Stockpile
- Utility
- Major Road
- Minor Road
- River/Stream
- Lake/Pond
- Proposed White Pine North Underground Mine Area
- Proposed Project Surface Extent



NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.
4. Site layout and infrastructure data from Ausenco, March 2026.

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REVIEWED BY:		DATE:	
APPROVED BY:		DATE:	

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FIGURE 2-1
SURFACE WATER MONITORING LOCATIONS
ENVIRONMENTAL MONITORING PLAN
WHITE PINE NORTH, ONTONAGON COUNTY, MI

Scale: 0 3,000 6,000 Feet

Date: JULY 2026

Drafted By: DAT

Project: 25W006

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Module Plan 3

Wetland Monitoring

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Environmental Monitoring Plan

3 Wetland Hydrologic Monitoring

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2 Wetland Hydrology Monitoring Program 2
2.1 Wetland Elevation Monitoring 2
3 Quality Assurance/Quality Control 3
4 Reporting 3

Table

Table 3-1 Wetland Piezometers and Staff Gauge Construction Details

Figure

Figure 3-1 Wetland Monitoring Plan

1 Introduction

The wetland portion of the Environmental Monitoring Plan (EMP) will describe the wetland hydrology monitoring plan for the following phases:

- Construction – the period of time when construction starts and when mine operations begin.
- Operations – the period of time when mine operations is operating, prior to reclamation.

Post-operations groundwater monitoring is detailed in Module 7 of the EMP.

This wetland hydrology monitoring plan will focus on the eastern portion of the Project Area over the proposed underground mine to:

- Compare the baseline water level fluctuations for wetlands to water elevations during mine operations above the underground mine.
- Weather data will be reviewed during the construction and operations periods to determine if evaluate hydrologic changes are elated to climatic changes (i.e., droughts) which might influence wetland hydrology.

2 Wetland Hydrology Monitoring Program

The wetland monitoring program consists of shallow and deep piezometer well nests and staff gauge installation along selected transect lines. Figure 3-1 shows the location of the piezometer nests. Table 3-1 provides the wetland piezometer construction summary information.

This section describes the procedure for monitoring water elevation. Included is the list of piezometers to be monitored, the monitoring frequency and procedure.

2.1 Wetland Elevation Monitoring

Water levels will be collected from the piezometer and staff gauge locations both on an automatic and manual basis. The piezometers will be recorded automatically with the transducers recording data every 4 hours. The piezometers and staff gauges will be read manually during sampling events or maintenance trips in the area. The monitoring events will occur on the frequency of semiannual during construction and operation phases utilizing standard procedures for collecting groundwater level measurements data. The manual groundwater level measurements will be recorded using field logbook procedures.

During the events, the staff will record the following data:

- Date/time and location identification
- Depth to the water level below measuring point
- Staff gauge elevation, if available

- Condition of piezometer and staff gauge
- Date/time transducer what downloaded and reprogrammed

3 Quality Assurance/Quality Control

A Quality Assurance Project Plan (QAPP) was prepared in preparation for the baseline groundwater and surface water data collection efforts. The QAPP will be revised, as necessary, and serve as the primary Quality Assurance/Quality Control document for the project's groundwater and surface water monitoring program. The revised QAPP will provide more detailed procedures on quality control sampling, sample handling, and laboratory quality assurance procedures that will be followed.

4 Reporting

A summary of wetland monitoring data will be included in the annual mining and reclamation report.

Table

Table 3-1
Wetland Piezometers and Staff Gauge Construction Details
White Pine Copper LLC

Piezometer ID	UTM Northing	UTM Easting	Top of Well Riser Elevation (ift)[1]	Ground Elevation (ift)[1]	Well Riser (ft ags)	Borehole Depth (ft bgs)	Borehole Diameter (in inches, to given depth in ft bgs)	Base of End Cap (ft bgs)	Base of Screen (ft bgs)	Top of Screen (ft bgs)	Transducer Logging Start Date	Transducer Logging Interval (hrs)	Transducer Sensor Elevation (ift)[1]
PZ1	5185737.03	310554.01	750.48	747.88	2.61	1.42	3" to 1.42'	1.38	1.25	0.42	5/7/2026	4	746.97
PZ1-A	5185737.36	310553.54	750.87	747.88	2.99	3.33	3" to 3.33'	3.33	3.21	0.83	5/7/2026	4	744.96
PZ-1 Staff Gauge	5185740.21	310552.36	752.34	747.35	752.34	--	--	--	--	--	5/7/2026	4	747.34
PZ2	5183641.14	309156.47	805.31	802.70	2.62	1.42	3" to 1.42'	1.38	1.25	0.42	5/8/2026	4	801.71
PZ2-A	5183640.68	309156.29	805.84	802.70	3.14	3.33	3" to 3.33'	3.33	3.21	0.83	5/8/2026	4	799.84
PZ2 Staff Gauge	5183642.69	309154.53	807.56	802.48	807.56	--	--	--	--	--	5/8/2026	4	802.58
PZ3	5183633.292	313271.0821	801.404	798.894	2.51	1.42	3" to 1.42'	1.38	1.25	0.42	6/9/2026	4	797.62
PZ3-A	5183632.986	313271.6093	801.874	798.894	2.98	3.33	3" to 3.33'	3.33	3.21	0.83	6/9/2026	4	795.58
PZ3 Staff Gauge	5183634.844	313271.052	803.19	798.134	803.19	--	--	--	--	--	6/9/2026	4	798.04

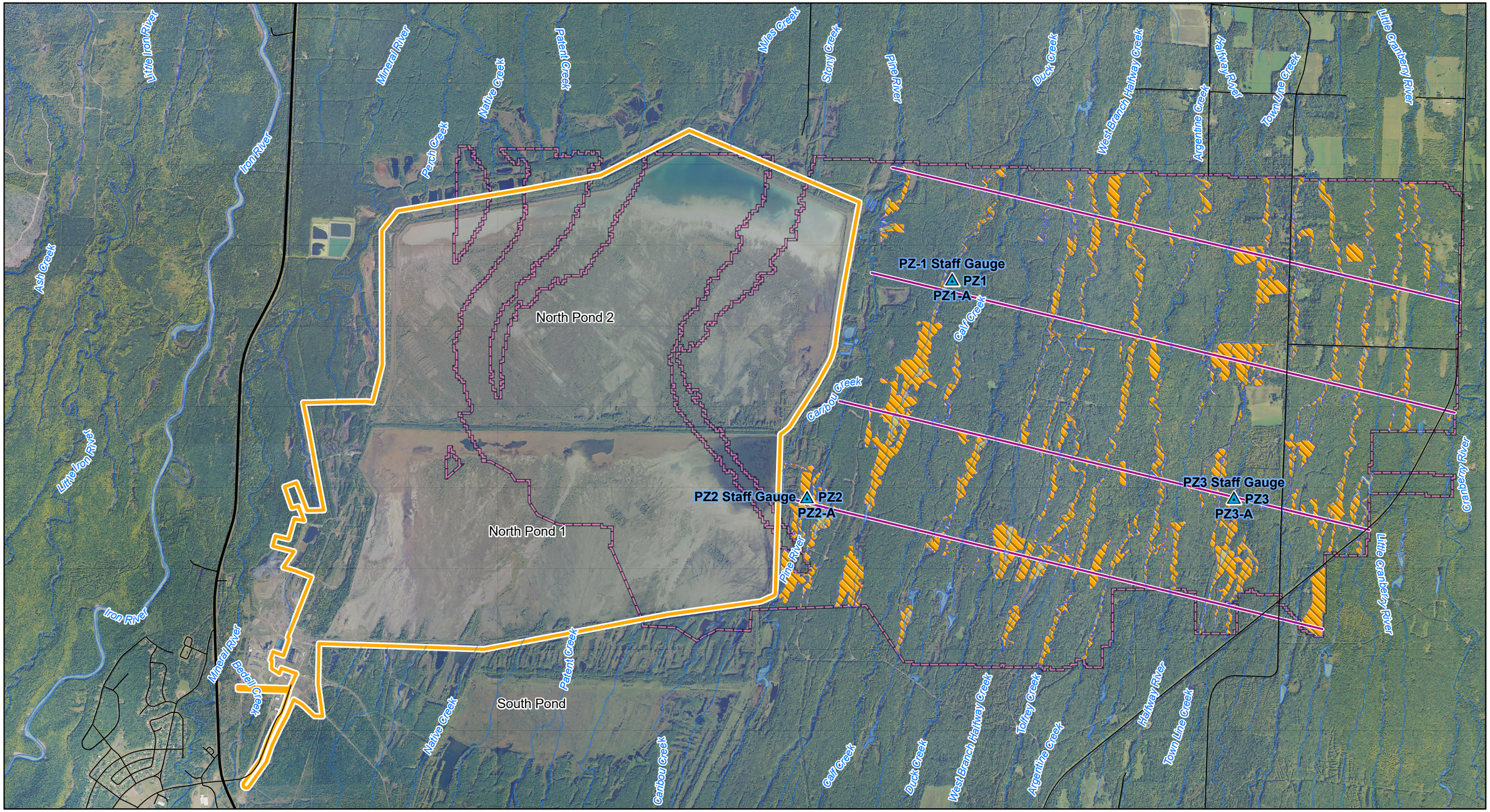
Notes:

Prepared by: NMG1
Checked by: MAN

UTM = Universal Transverse Mercator (UTM) Zone 16 North; North America Datum of 1983
ft = feet
ft ags = feet above ground surface
ft bgs = feet below ground surface
hrs = hours
ID = identification
ift = international feet
PVC = polyvinyl chloride

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Figure



NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.

LEGEND

- Surveyed Piexometers
- Major Road
- Minor Road
- River/Stream
- Lake/Pond
- Transects
- UG Mine Area Delineated Wetlands 2025
- Proposed Project Surface Extent
- Proposed White Pine North Underground Mine Area

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FIGURE 3-1
WETLAND MONITORING PLAN
ENVIRONMENTAL MONITORING PLAN
WHITE PINE NORTH, ONTONAGON COUNTY, MI

Scale: 0 1,500 3,000 Feet

Date: JULY 2026

Drafted By: DAT

Project: 25W006

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Module Plan 4

Biological Monitoring

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Environmental Monitoring Plan

4 Biological Monitoring

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3.7 Relocation of Threatened/Endangered 4
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4.1 Aquatic Assessments 5
5 Reporting 6
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Table 4-1 Aquatic Sampling Station Description

Figures

Figure 4-1 Wildlife Observation Locations
Figure 4-2 Aquatic Sampling Locations

1 Overview

R 425.203(k) requires plans to monitor, prevent, minimize, and mitigate adverse impacts of the proposed mining operation on flora, fauna, fish, wildlife habitats, and biodiversity. Baseline conditions have been documented in the Environmental Impact Assessment (EIA) (Foth, 2026). These studies and results provide the comparative information for future surveys during construction, operation, and post-closure for the Project. Over the life of mine and beyond, the data and observations will be collected by qualified professionals and will assist in identifying trends in biota in and around the Project site. These trends, along with media data such as groundwater and surface water quality and presence, can indicate whether an observed trend is related to the Project.

2 Flora (Terrestrial Vegetation)

Terrestrial flora monitoring to address construction and operation periods will include annual observations of plant species along transects as shown on Figure 4-1. Meander surveys through upland habitats to develop species inventory and surveys within the established transects will address the scope of upland vegetative survey. Observations will be documented and included with the Project's annual Mining and Reclamation Report. The terrestrial flora and fauna surveys conducted prior to construction (Stantec, 2025) did not identify Threatened, Endangered, or Special Concern (collectively "TESC") plant species.

3 Fauna (Terrestrial Wildlife)

Terrestrial wildlife monitoring during the Project operations will include annual observations of amphibians, reptiles, birds, and mammals at designated survey sites shown on Figure 4-1. Observations will be documented and included with the Project's annual report. The fauna monitoring will be completed to confirm baseline conditions and document the trends and conditions of these resources during operations.

3.1 Amphibians

Surveys for frogs and toads will be conducted in accordance with the protocols developed by the Michigan Department of Natural Resources Wildlife Division (MDNR, undated). Survey methodology will consist of listening for breeding calls of frogs and toads at established survey locations for a fixed period of time during the annual survey. Observations reported will include the species of frogs and toads heard and the relative abundance of each species. Survey plot locations are provided on Figure 4-1.

Surveys for salamanders will be conducted during optimal seasonal periods following the transects provided on Figure 4-1.

3.2 Reptiles

Reptile surveys will be performed annually from observation points depicted on Figure 4-1. Annual surveys for reptiles will focus on those species reported in the baseline studies

(Stantec, 2026a; AEM, 2025) as occurring on the Project site. Those reported species include Northern red-bellied snake (Storeria occipitomaculata), Ring-necked snake (Diadophis punctatus), Eastern Garter snake (Thamnophis sirtali), Snapping turtle (Chelydra serpentina), and Western painted turtle (Chrysemys picta). A wood turtle survey was completed by Stantec in 2024 and 2025 (Stantec, 2026a) and wood turtles were not found in the Project Area, therefore specific wood turtle surveys will not be repeated. Surveys for snakes will be opportunistic observations during the course of other studies. Opportunistic observations of other reptile species will also be reported.

3.3 Birds

Annual surveys for birds will be conducted in accordance with methods utilized in *The Atlas of Breeding Birds of Michigan* (Brewer et al, 1991). Sampling methodology will consist of a series of point surveys where all birds seen or heard in an unlimited radius for a 10-minute period will be recorded on data sheets. Locations of sampling points are depicted on Figure 4-1. Migratory birds will also be surveyed at these locations.

3.4 Mammals

3.4.1 Small Mammals

Annual surveys for small mammals will be conducted using a combination of drift fences and live traps, similar to baseline studies (Stantec, 2026c). Live traps will be in accordance with recognized methodologies (Schemnitz et al., 2009). Traps and drift fences will be deployed in an array at survey points depicted on Figure 4-1.

3.4.2 Large Mammals

Annual surveys for large mammals will be opportunistic observations of large mammals while conducting vegetation surveys, small mammal surveys, bird surveys, frog and toad surveys, and at any other time during the course of conducting field work in the study area. Occurrences reported will be both direct observation and indirect evidence such as scat, tracks, feeding areas or similar evidence.

3.5 Wildlife Habitats

Annual terrestrial wildlife habitat monitoring during the Project operations will include annual qualitative documentation and analysis of trends within the on-site habitats. Habitat characterization will be in accordance with “A Field Guide to the Natural Communities of Michigan” (Cohen et al., 2014). Qualitative documentation will be opportunistic observations of the character and quality of habitat obtained during terrestrial flora and fauna surveys described elsewhere in this document.

3.6 Biodiversity

Annual biodiversity monitoring and reporting will be an analysis of aggregate data obtained during terrestrial flora and fauna surveys described in this document and will be a comparison

to prior years' findings. Observations will be documented and included with the Project's annual report.

3.7 Relocation of Threatened/Endangered

Prior to disturbance in new work areas, White Pine Copper will complete a pre-activity review using available listed-species information relevant to the area of proposed work, including baseline biological studies (Stantec, 2026b), agency correspondence, and other occurrence information available to the Project. If White Pine Copper determines during a pre-activity review and/or monitoring surveys that a threatened or endangered species may be affected by a proposed activity, the Project will coordinate with the Michigan Department of Natural Resources and, where applicable, the appropriate federal agency before proceeding with the affected activity. Protective measures developed through that coordination may include additional surveys, work buffers, timing restrictions, modified methods, or other species-specific protections necessary to maintain compliance with Part 365 and applicable federal endangered species requirements. If threatened or endangered species cannot be avoided, relocation or handling procedures will be implemented only in coordination with appropriate agencies, and only where authorized or otherwise allowed under applicable state and federal requirements.

4 Aquatic Biota

Survey Approach

The Project surveys and assessments focus on conditions of aquatic biota and their habitats in ponds and streams in the vicinity of the Project Area. The streams and ponds included are located within the Lake Superior basin and they discharge or flow north towards Lake Superior. Annual survey assessments will be documented and included in the Project annual report.

An aquatic baseline survey (AEM, 2025) was conducted in 10 stream sample and included fish, macroinvertebrate, water quality, mussels, and habitat community ratings according to the procedures and metrics outlined in the Surface Water Assessment Section (SWAS) Procedure Number 51 (P-51; MDEQ, 2008), a survey protocol for wadable streams and rivers. Annual surveys will be conducted following the same protocol. Sampling at the same locations and in similar fashion as baseline sampling will provide a uniform, repeatable and comparable dataset that can be used to identify the response of these aquatic resources to mining activities. Sampling of ponds near the proposed project surface extent was also included in the baseline sampling and will be repeated in some of these ponds.

Monitoring Locations

Monitoring aquatic biota will take place at 10 stream locations established in baseline sampling, shown on Figure 4-2 and further described in Table 4-1. A total of three of these locations have been established as aquatic sampling reference stations (control sites), including Duck Creek, Mineral River, and Caribou Creek, as indicated on Table 4-1. Two pond locations north of the proposed project surface extent, as shown on Figure 4-2, will also be included in sampling events.

4.1 Aquatic Assessments

Aquatic assessment will include the following:

- mussels
- macroinvertebrates
- fish
- habitat assessment

Mussels
Mussel assessments will be performed annually at each aquatic sampling location shown on Figure 4-2, following the procedures in P-51 (MDEQ, 2008). Specific assessment locations will be based on the most suitable mussel habitat present at each sampling location. If mussel habitat is not found, an alternate study site will be located if available. If an alternate assessment site is not located, mussel assessments will not be initiated for that location and appropriately noted.

Aquatic Macroinvertebrates
Macroinvertebrate community assessments will be completed annually at the sampling stations shown on Figure 4-2. Sampling will be completed according to protocols outlined in P-51 (MDEQ, 2008).

A list of species sampled and calculated metrics for abundance, richness, and various water quality and diversity indices will be derived for each sampling location.

Fish Community
The fish community will be assessed at the sampling locations by completing direct sampling according to protocols outlined in P-51 (MDEQ, 2008). An annual survey event will be completed. Following fish community sampling, various community and diversity metrics and biotic indices will be calculated for each waterbody sampled. Measurements, data, and observations will be included in the Annual Report.

Habitat Assessment
Habitat assessments will be completed annually on the aquatic sampling sites including the three reference sites. Stream habitat surveys will be completed based on protocols included in P-51 (MDEQ, 2008) (wadeable streams) and MDEQ protocols for non-wadeable streams. Pond habitat assessments will be completed based on methods presented in Limnology, Zooplankton and Shoreline Sampling in Inland Lakes (MDNR, 2007). These protocols will be implemented the same manner as the baseline study.

Water Quality
The P-51 protocols (MDEQ, 2008) are meant to support ambient water quality monitoring. Water quality sampling will be conducted as described in Module Plan 2 of this EMP.

5 Reporting

Flora, fauna, biological, and sediment data will be summarized in the annual mining and reclamation report.

6 References

Advanced Ecological Management, LLC, 2025. *White Pine North Baseline Aquatic Survey Report 2024*. April 8, 2025.

Brewer, R., G.A. McPeek, and R.J. Adams Jr. 1991. The Atlas of Breeding Birds of Michigan. Michigan State University Press.

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Stantec, 2025. Rare Plant Species Surveys, Natural Community and Land Cover Mapping Report White Pine North Project. March 19, 2025

Stantec, 2026a. *Wood Turtle Survey White Pine North Project*. March 18, 2026.

Stantec, 2026b. White Pine North Species Inventory: Small Mammals, Reptiles, and Amphibians. February 20, 2026.

Stantec, 2026c. *Aerial Eagle and Raptor Nest Survey, White Pine North Project*. February 2026.

Table

Table 4-1
Aquatic Sampling Station Description
White Pine Copper LLC

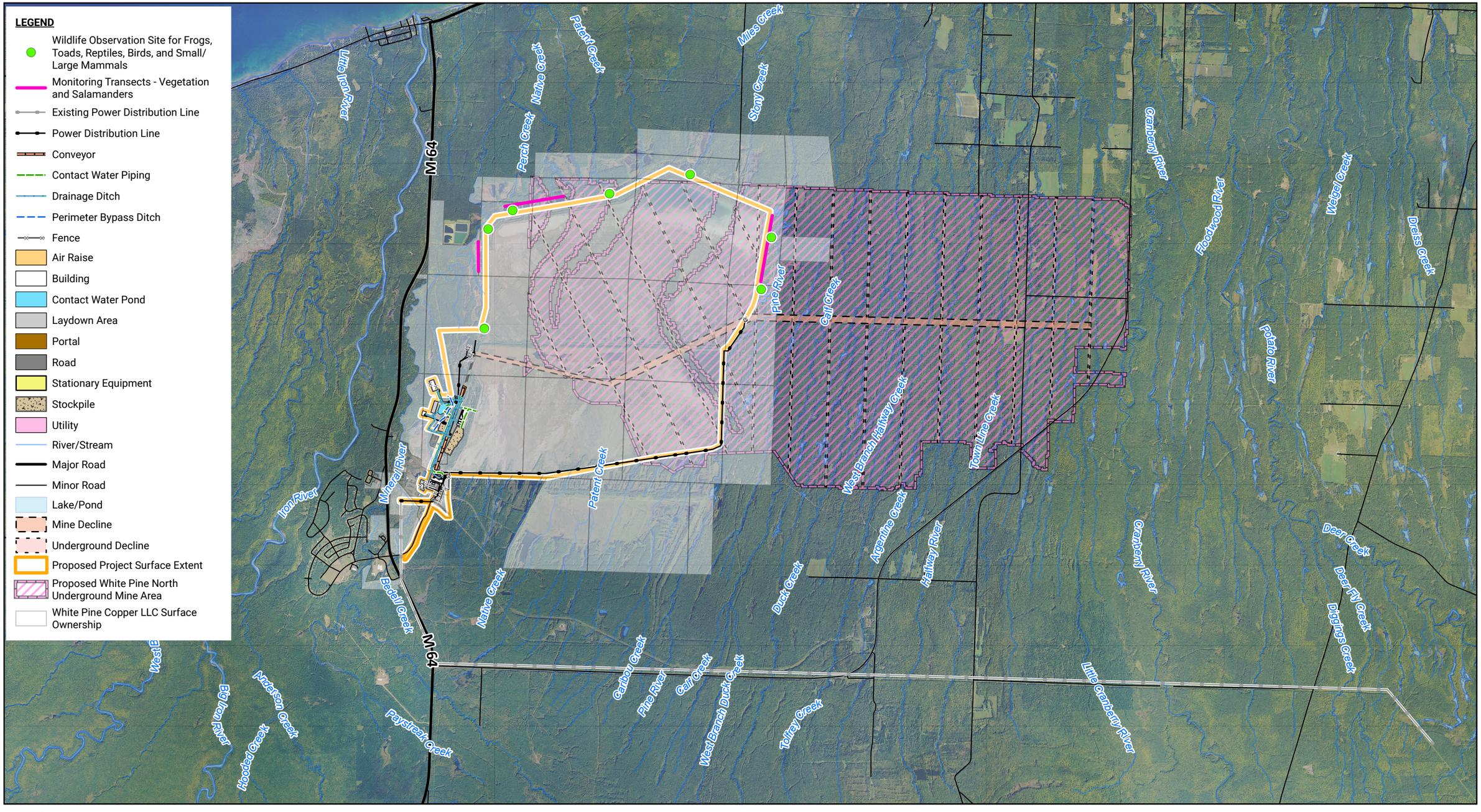
Sampling Station	Aquatic Resource	Selection Criterion
AQ1	Mineral River	Upstream of Project Area; Reference Location for western side of Project Surface Extent
AQ2	Caribou Creek	Upstream of Project Area; Reference Location for central part of Project Surface Extent
AQ3	Duck Creek	Upstream of Project Area
AQ4	Argentine Creek	Upstream of Project Area
AQ5	Pine Creek	Downgradient Edge of Project Surface Extent
AQ6	Unnamed pond	Downgradient Edge of Project Surface Extent
AQ7	Unnamed pond	Downgradient Edge of Project Surface Extent
AQ8	Prech Creek	Downgradient Edge of Project Surface Extent
AQ9	Mineral River	Downgradient Edge of Project Surface Extent
AQ10	Duck Creek	Adjacent to and Downgradient from Project Surface Extent East Side. Reference Location for North Side.
AQ11	Argentine Creek	Adjacent to and Downgradient from Project Surface Extent East Side
AQ12	Miles Creek	Downgradient from Project Surface Extent

Prepared by: HLH
Checked by: NMG1

Figures

LEGEND

- Wildlife Observation Site for Frogs, Toads, Reptiles, Birds, and Small/ Large Mammals
- Monitoring Transects - Vegetation and Salamanders
- Existing Power Distribution Line
- Power Distribution Line
- Conveyor
- Contact Water Piping
- Drainage Ditch
- Perimeter Bypass Ditch
- Fence
- Air Raise
- Building
- Contact Water Pond
- Laydown Area
- Portal
- Road
- Stationary Equipment
- Stockpile
- Utility
- River/Stream
- Major Road
- Minor Road
- Lake/Pond
- Mine Decline
- Underground Decline
- Proposed Project Surface Extent
- Proposed White Pine North Underground Mine Area
- White Pine Copper LLC Surface Ownership



NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.
4. Site layout and infrastructure data from Ausenco, March 2026.

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Foth Infrastructure & Environment, LLC

REVISED	DATE	BY	DESCRIPTION

PREPARED BY: NEE	DATE: 6/11/2026
REVIEWED BY: HLH	DATE:
APPROVED BY:	DATE:

WHITE PINE COPPER LLC

FIGURE 4-1
WILDLIFE OBSERVATION LOCATIONS
ENVIRONMENTAL MONITORING PLAN
WHITE PINE NORTH, ONTONAGON COUNTY, MI

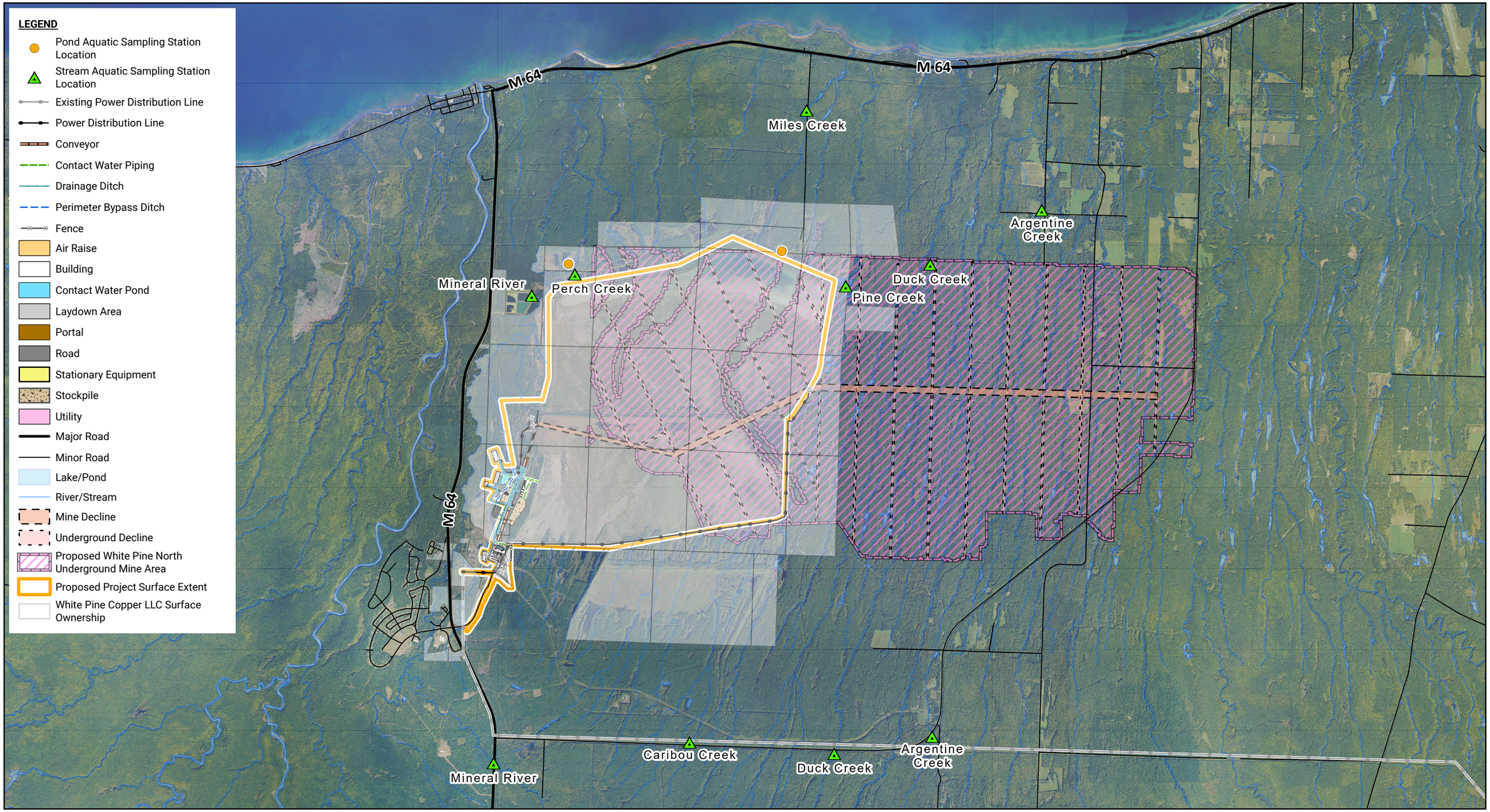
Scale: 0 2,500 5,000 Feet

Date: AUGUST 2026

Drafted By: DAT

Project: 25W006

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NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.
4. Site layout and infrastructure data from Ausenco, March 2026.

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Foth Infrastructure & Environment, LLC			
REVISED	DATE	BY	DESCRIPTION

PREPARED BY:	DATE: 6/11/2026
REVIEWED BY: HLH	DATE:
APPROVED BY:	DATE:

WHITE PINE COPPER LLC

FIGURE 4-2
AQUATIC SAMPLING LOCATIONS
ENVIRONMENTAL MONITORING PLAN
WHITE PINE NORTH, ONTONAGON COUNTY, MI

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Drafted By: DAT	Project: 25W006

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Module Plan 5

Operations Monitoring

Foth Infrastructure & Environment, LLC

Environmental Monitoring Plan

5 Operations Water Monitoring

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1 Operations Water Monitoring 2
2 Quality Assurance/Quality Control 2
3 Reporting 2

Table

Table 5-1 Operations Water Sampling Parameters

Figure

Figure 5-1 Mine Site Layout – Sampling Locations

1 Operations Water Monitoring

The operations water portion of the Environmental Monitoring Plan described in this section is designed to assist with meeting the requirements of R 425.203(c)(v) and R 425.409. Mine operations water monitoring shall be collected and analyzed on a quarterly basis from the following locations:

- Ore Storage Pads
- Contact Water Pond
- North Pond 1
- North Pond 2
- Underground Mine
- Influent to the Industrial Wastewater Treatment Facility

Figure 5-1 shows the sample locations. Contact water samples will be tested for the parameters listed in Table 5-1.

2 Quality Assurance/Quality Control

A Quality Assurance Project Plan (QAPP) was prepared in preparation for the baseline groundwater and surface water data collection efforts. The QAPP will be revised, as necessary, and serve as the primary Quality Assurance/Quality Control document for the project's groundwater and surface water monitoring program. The revised QAPP will provide more detailed procedures on quality control sampling, sample handling, and laboratory quality assurance procedures that will be followed.

3 Reporting

A summary of monitoring data and analyses will be included in the annual mining and reclamation report.

Table

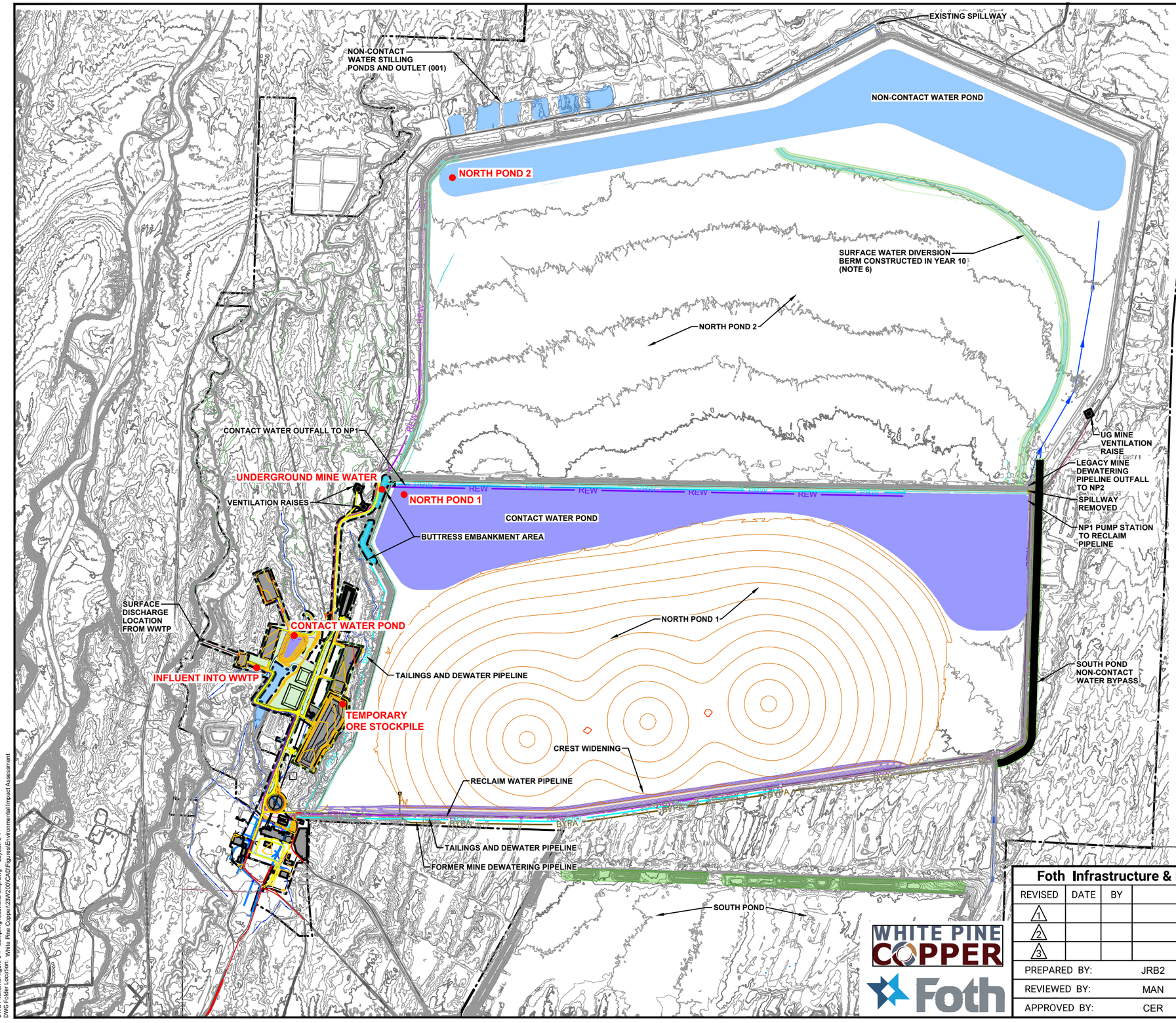
Table 5-1
Operations Water Sampling Parameters
White Pine Copper LLC

Parameters	Units	Analytical Method	Target Detection Level
Field Parameters			
Oxidation Reduction Potential	mV	Field	NA
Field pH	S.U.	Field	NA
Specific Conductance	umhos/cm	Field	NA
Temperature	ºC	Field	NA
Dissolved Oxygen	mg/L	Field	NA
Color	PCU	Field	NA
Turbidity	NTU	Field	NA
Lab Parameters			
Arsenic	µg/L	EPA-200.8/6020	5
Cadmium	µg/L	EPA-200.8/6020	1
Calcium	mg/L	EPA-200.7/6010B	0.5
Chloride	mg/L	325.2/4500-CL E	1
Copper	µg/L	EPA-200.8/6020	4
Copper - Dissolved	µg/L	EPA-200.8/6020	4
Hardness	mg/L	SM 2340C	1
Iron	µg/L	EPA-200.7/6010B	200
Lead	µg/L	EPA-200.8/6020	3
Magnesium	mg/L	EPA-200.7/6010B	1
Mercury	ng/L	EPA-1631E	0.5
Nitrite	mg/L	EPA 353.2 or 354.1/4500 NO2B	0.02
Nitrogen, Nitrate	mg/L	353.2/4500 NO3F	0.02
Potassium	mg/L	EPA-200.7/6010B	0.5
Selenium	µg/L	EPA-200.8/6020	5
Silver	µg/L	EPA-200.8/6020	0.2
Sodium	mg/L	EPA-200.7/6010B	1
Sulfate	mg/L	EPA-375.4/9038	2
Total Dissolved Solids	mg/L	EPA-160.1	5
Total Suspended Solids	mg/L	EPA- 160.2	5
Total Organic Carbon	mg/L	EPA 9060A	1
Dissolved Organic Carbon	mg/L	EPA 9060A	1

Prepared by: NMG1
Checked by: HLH

Abbreviations:
°C = degrees Celsius
EPA = United States Environmental Protection Agency
mg/L = milligrams per liter
mV = millivolts
NA = not applicable
ng/L = nanograms per liter
NTU = Nephelometric Turbidity Units
S.U. = standard unit
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter

Figure



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- EXISTING STORMWATER PIPE
- PROPOSED ROAD
- NEW 13.8kV UNDERGROUND LINE
- NEW 13kV OH LINE
- NEW 69kV LINE
- PROPOSED WATER LINE
- NEW DISCHARGE PIPE
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- DISCHARGE PIPING
- RECLAIM WATER PIPELINE
- TAILINGS PIPELINE
- FORMER MINE DEWATERING PIPELINE
- ONTANOGAN WTP TO UG PORTAL
- ONTONAGON WTP TO RAW WATER TANK
- POTABLE WATER TO BUILDINGS
- SEWERLINE - BUILDINGS TO LIFT STATION
- TRUCK SHOP TO PLANT POND
- UG PORTAL TO NORTH POND
- USWP B TAILINGS CORRIDOR
- WATER PLANT NORTH POND
- WPC WTP TO UG WATER TANK
- WPC WTP TO UG PORTAL
- PHASE 1 BUILDING
- PHASE 2 SEEDING AREAS
- CONTACT WATER POND
- NON-CONTACT WATER POND
- PHASE 1 TAILING ROADS
- FINAL GRADING CONTOUR (MAJOR)
- FINAL GRADING CONTOUR (MINOR)
- FINAL GRADING CONTOUR (DEPRESSION)
- SAMPLING LOCATION

NOTES:

1. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
2. HYDROGRAPHIC FROM USGS.
3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. SURFACE WATER DIVERSION AND DITCH ROUTING CONSTRUCTED IN MINE YEAR 10 IN ADVANCE OF NP2 DEPOSITION, YEARS 12-26.

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Foth Infrastructure & Environment, LLC

REVISED	DATE	BY	DESCRIPTION
1			
2			
3			

PREPARED BY:	JRB2	DATE: JULY '26
REVIEWED BY:	MAN	DATE: JULY '26
APPROVED BY:	CER	DATE: JULY '26

WHITE PINE COPPER LLC

FIGURE 5-1

MINE SITE LAYOUT
SAMPLING LOCATIONS
ENVIRONMENTAL MONITORING PLAN

Scale: SEE BAR SCALE	Date: AUG. 2026
Drafted By: JRB2	Project: 23W200

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DWG Filename: figure 5-1 - sampling locations emp.dwg Layout: 5-1
DWG Folder Location: White Pine Copper\23W200\CAD\Figures\Environmental Impact Assessment

Module Plan 6

Mine Facility Monitoring

Foth Infrastructure & Environment, LLC

Environmental Monitoring Plan

6 Mine Facilities and Environmental Protection Measures Inspection

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1 Mine Facilities Monitoring 2
1.1 General Mine Facilities and Environmental Protections 2
1.2 Underground Mine Monitoring 3
1.3 General Mine Facilities and Environmental Protections 3

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Table 6-1 Miscellaneous Operational Environmental Monitoring Inspection and Maintenance Activities
Table 6-2 Underground Mine Inspection Plan and Schedule

1 Mine Facilities Monitoring

Mine facilities include infrastructure and environmental monitoring and protection devices including the following categories and items tabulated below. As required in R 425.203(m), Inspections of mine-related facilities are listed on Tables 6-1 and 6-2 considering:

- Observation/inspection items.
- Inspection frequency.
- Corrective action.

Category	Structure
General Mine Facilities	Haul Roads Pipelines Tailings Management Facility - Perimeter roads/culverts - Perimeter berm and waste rock outslopes Soil stockpiles Contact Water Basins and Non-contact Water Basins
Underground Mine	Equipment Ventilation Systems Shaft System Travelways Roof & Rib support Ground Control Lighting Emergency Response Equipment Emergency Preparedness Signage Communication Plan
General Environmental Protection Measures	Liners Leachate Collection System Leakage Detection System Groundwater Monitoring Wells Pavement and impervious surfaces Soil erosion and control devices

1.1 General Mine Facilities and Environmental Protections

R 203(c)(xxiv) requires plans for inspecting, monitoring, and maintain liners, final covers, leachate collection systems, leak detection systems, berms, and embankments, including the frequency of inspections which is required to occur at least monthly. Table 6-1 lists the

equipment or area requiring inspection during operations along with the preventive maintenance/inspection required; corrective maintenance procedures; equipment requirements; maintenance material needs; and inspection frequency.

1.2 Underground Mine Monitoring

The underground mine inspection activities are listed on Table 6-2.

1.3 General Mine Facilities and Environmental Protections

R 203(c)(xi) requires a plan for subsidence. Potential impacts to surface infrastructure, TDFs, and groundwater monitoring wells have been modeled and discussed in further detail in the Mining Permit Application. In summary, based on geotechnical investigations and modeling bedrock deflection and subsidence, the clayey sand alluvium soils predict surface subsidence is half the recommended differential settlement. Stable pillars and elastic deformation of the pillars will be monitored during operations as listed in Table 6-2. If pillar performance differs from typical range, mitigation options will be implemented to arrest further deterioration of pillars.

Tables

Table 6-1
Miscellaneous Operational Environmental Monitoring Inspection and Maintenance Activities
White Pine Copper LLC

Equipment or Area	Description	Preventive Maintenance/Inspection	Corrective Maintenance Procedures	Equipment Requirements	Material Needs	Inspection Frequency
1. Storm Water Management and Erosion Control Structure	Ditches, Culverts, Spillways, etc.	1. Clean sediment from ditches. 2. Clean culverts and ditches of debris.	1. Replace rusted or damaged culverts. 2. Repair eroded areas and install erosion control measures to remedy erosion.	Backhoe, truck, shovels	Fill soil, erosion control materials (e.g., riprap, erosion mat)	Minimum Monthly and after major storm event
2. Storm Water Detention Ponds including Contact Water Ponds and Non-Contact Water Ponds	Detention pond influent pipes, discharge structures and pond bottoms	1. Clean influent pipes and effluent structures and ditches of debris. 2. Observe storm water for signs of surface water pollution.[1] 3. Check dead storage (i.e., sediment thickness). 4. Check vegetation on interior and exterior berms.	1. Replace rusted or damaged piping or effluent structures. 2. Pump contaminated stormwater to the contact water basin. 3. Remove sediment if thickness is 1.5 -2.0 feet. 4. Reseed and provide erosion mat or riprap in eroded areas.	Backhoe, truck, pump	Piping Seed, erosion mat and riprap	Annual
3. Soil and Erosion Control Devices	Complete inspection per the approved SESC plan	1. Refer to approved SESC plan for details.	1. Refer to SESC plan section of MPA for details.			Minimum Monthly and after major storm event
4. Access Roads and Haul Roads		1. Minimize tracking on paved roads, clean as needed. 2. Inspect for spilled ore or waste rock.	1. Repair ruts, pot holes, etc. 2. Inspect for ruts or road damage. 3. Remove spilled ore or waste rock and dispose of in TDF.	Truck, shovels, road sweeper	Road gravel, Bituminous patch	Minimum Monthly or as needed
5. Soil Stockpiles	Topsoil and other soil stockpiles	1. Maintain silt fences. 2. Maintain other erosion control devices. 3. Inspect for erosion and soil displacement by wind or water. 4. Inspect vegetation for growth and coverage.	1. Replace or repair silt fence as needed. 2. Repair eroded areas including regrading and revegetation. 3. Clean ditches where silt and/or sand has accumulated.	Shovel, backhoe	Silt fencing	Minimum Monthly

Table 6-1 (continued)

Equipment or Area	Description	Preventive Maintenance/Inspection	Corrective Maintenance Procedures	Equipment Requirements	Material Needs	Inspection Frequency
6. Environmental Monitoring Devices	Groundwater Monitoring Wells and staff gauges	1. Inspect locking caps and surface seals.	1. Repair/replace broken caps, surface seals and locks.	Shovel	Protector pipes, concrete, bentonite, lock/key set, PVC pipe	Quarterly during regular monitoring events
7. Security Devices	Means to Control Entry (fencing/gates) Exterior Lighting	1. Replace damaged fence/gates. 2. Replace burnt out bulbs.	1. Repair or replace worn or rusty fences. 2. Repair rusty or broken locks, etc.	Miscellaneous	Fence/gate parts and locks	Quarterly
8. Contact Water Pond Containment Berms		1. Inspect berms for erosion/displacement. 2. Assess berm seeps.	1. Repair eroded areas including revegetated and grading. 2. Provide additional fill material if displacement has occurred.	Backhoe	Fill material	Quarterly and after major precipitation events
9. Slurry Pipeline, Contact Water Pipelines, and Tailings Pipelines		1. Inspect pipelines for leaks. 2. Inspect leak detection manholes.	1. Repair damage or pipeline breach. 2. Seal manhole cracks or joints. 3. Remove solids accumulation in manhole.	Lift Truck, extrusion welding equipment	Pipe patch epoxy seal coat, HDPE pipe, patch small holes with extrusion patch or cut and replace larger damaged areas.	Once per shift

Notes:

Prepared by: NMG1

Checked by: HLH

[1] Storm water pollution is evidenced by color, odor, turbidity, floating solids, and foam or oil sheen.

[2] SESC Plan is prepared per Part 91 of NREPA. The SESC Plan contains requirement for inspection of soil erosion control devices and documentation and report of inspections and repairs the records for which must be retained on site.

Abbreviations:

HDPE = high density polyethylene

LCS = leachate collection system

LDS = leak detection system

EGLE = State of Michigan Dept of Environment, Great Lakes & Energy

MPA = Mining Permit Application

NREPA = Natural Resources and Environmental Protection Act

O&M = Operation and Maintenance

PVC = polyvinyl chloride

SESC = Soil Erosion and Sediment Control

Table 6-2
Underground Mine Facilities Inspection Plan and Schedule
White Pine Copper LLC

Facility Description	Observation/Inspection Items	Inspection Frequency	Corrective Action
Underground Mine	1. Equipment - mining machinery (operating properly, safe guards in place and secure, etc.)	Daily / Shift	Remove equipment and / or lock out - tag out system until repairs can be made.
	2. Ventilation systems	Daily / Shift	Complete required repairs.
	3. Decline System	Monthly	Complete required repairs.
	4. Travelways (roads, blind spots, and crossing areas are properly marked)	As required	Signage and clear directions are present
	5. Roof & Rib Support (including unusual cracking and visible rock shifting)	Daily / Shift	roof control such as screen, steel straps, header boards or larger roof bolt plates.
	6. Ground Control	Daily / Shift	Use bolting, meshing and other reinforcement systems to secure vulnerable areas.
	7. Lighting	Daily / Weekly	Complete required repairs.
Safety	1. Personal Protective Equipment (hard hat, steel toe shoes, safety glasses, gloves, hearing protection, respitory masks, etc.)	Shift / more frequently as conditions require	Clean or repair as required.
	2. Emergency Exits Clearly Marked	Monthly	Complete required repairs.
	3. Emergency Response Equipment	Daily / Shift	Report to mine engineer and take appropriate actions immediately.
	4. Emergency Preparedness	Weekly	Make corrective actions as needed.
	5. Signage	Monthly	Replace or repair.
	6. Communication Plan	Monthly	Make corrective actions as needed.
Work Area	1. Communication devices	Daily / Shift	Replace or repair as required.
	2. Workspace organized and clean	Daily / Shift	Make corrective actions as needed.
	3. Work permit / Training current	Daily / Shift	Make corrective actions as needed.

Prepared by: NMG1
Checked by: HLH

Module Plan 7

Post-Closure Monitoring

Foth Infrastructure & Environment, LLC

Environmental Monitoring Plan

7 Post-Closure Monitoring

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Table 7-2 Post-Closure Surface Water Monitoring Station Locations and Descriptions
Table 7-3 Post-Closure Mine Facilities Inspection Plan and Schedule

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Figure 7-2 Phase 1 Post-Closure Surface Water Monitoring Locations
Figure 7-3 Phase 2 Post-Closure Surface Water Monitoring Locations

1 Post-Closure Monitoring

This section will describe the procedures for groundwater, surface water, flora and fauna, and mine facilities monitoring after Michigan Department of Environment, Great Lakes, and Energy (EGLE) has approved reclamation of the Project.

2 Post-Closure Groundwater and Surface Water Monitoring

2.1 Purpose and Scope of Monitoring Program

Monitoring of groundwater and surface water quality and elevation will continue until Mine Year 27. The post-closure monitoring program is defined in two separate phases. Phase 1 post-closure is a 5-year period beginning in Mine Year 27 that provides a comprehensive monitoring plan carried forward from the mine operating period through cessation of the wastewater treatment plant. During Phase 2, which begins in Mine Year 31 and extends through Mine Year 48, following completion and approval of reclamation for the Project as described in R 425.407, a reduced monitoring plan will be implemented. The goal of post-closure monitoring is to demonstrate to EGLE that there is no significant potential for water contamination resulting from the mining operation.

Monitoring threatened and endangered species, flora, fauna, fish and wildlife habitats, and biodiversity, as described in Environmental Monitoring Plan (EMP) Module 4, will be discontinued in Phase 2 post-closure.

2.2 Post-Closure Groundwater Monitoring Program

Groundwater monitoring and sampling will continue in the post-closure period. During Phase 1 post-closure monitoring of groundwater quality and elevation will continue as described in EMP Module 1. Once final reclamation is complete, groundwater monitoring well NB1-1R, NB1-3R, NB2-1R and NB2-3R will be installed in the tailing area as shown on Figure 7-1. Phase 1 post-closure monitoring will be the same frequency and parameters as the other compliance wells at the site.

During Phase 2 post-closure, the reduced monitoring plan will be implemented in Mine Years 31 through 48. Table 7-1 presents the well list for Phase 2 post-closure groundwater sampling. The list of wells to be sampled will be reduced from operations to Phase 2 post-closure and the frequency is reduced from quarterly to semiannual. The locations of the wells to be monitored during Phase 2 post-closure are shown on Figure 7-1. The same sample parameter list from Table 1-2 in the Groundwater Monitoring Module 1 will be used for Phase 2 post-closure monitoring. The methods for data collection and analysis will proceed as described in that module.

2.3 Post-Closure Surface Water Monitoring Program

During Phase 1 post-closure, monitoring of surface water quality and elevation will continue as described in EMP Module 2. Surface water sampling will continue in the Phase 2 post-closure period without elevation and flow measurements at a frequency of semiannual.

During Phase 2 post-closure a reduced monitoring plan will be implemented in Mine Years 31 through 48. Table 7-2 presents the list of surface water sampling locations for Phase 2 post-closure. The methods for data collection and analysis will proceed as described in EMP Module 2. Surface Water Monitoring and samples will continue to be analyzed for the analyses listed in Table 2-2. Figure 7-2 shows the Phase 1 post-closure surface water monitoring locations and Figure 7-3 shows the surface water monitoring locations during Phase 2 post-closure.

3 Post-Closure Flora and Fauna Monitoring Program

Monitoring of threatened and endangered species, flora, fauna, fish and wildlife habitats, and biodiversity, as described in EMP Module 4, will be discontinued in Phase 2 post-closure.

4 Post-Closure Mine Facilities Monitoring

Rule 203(c)(xxiv) requires plans for inspecting areas during post-closure. Table 7-3 lists the area requiring inspection post-closure along with the preventive maintenance/inspection required; corrective maintenance procedures; equipment requirements; maintenance material needs; and inspection frequency throughout Phase 1 and Phase 2.

Tables

Table 7-1
Post-Closure Groundwater Monitoring and Sampling Locations
Phase 2 Post-Closure
White Pine Copper LLC

Well ID	Groundwater Elevation Frequency	Water Quality Sampling Frequency
MW-1AR	semiannual	semiannual
MW-1BR	semiannual	semiannual
MW-2A	semiannual	semiannual
MW-2B	semiannual	semiannual
MW-2SB	semiannual	semiannual
MW-3A	semiannual	semiannual
MW-3B	semiannual	semiannual
MW-5/MW-5A	semiannual	semiannual
MW-5SB	semiannual	semiannual
MW-18	semiannual	semiannual
MW-19	semiannual	semiannual
MW-31	semiannual	semiannual
MW-35	semiannual	semiannual
MW-35SB	semiannual	semiannual
MW-37	semiannual	semiannual
MW-38	semiannual	semiannual
MW-43	semiannual	semiannual
MW-43SB	semiannual	semiannual
MW-44	semiannual	semiannual
NB1-1R [1]	semiannual	semiannual
NB1-3R [1]	semiannual	semiannual
NB2-1R [1]	semiannual	semiannual
NB2-3R [1]	semiannual	semiannual
SMW-1	semiannual	semiannual
SMW-1SB	semiannual	semiannual
SMW-3	semiannual	semiannual
SMW-3SB	semiannual	semiannual
MW-45 - Proposed	semiannual	semiannual
MW-46 - Proposed	semiannual	semiannual
MW-47 - Proposed	semiannual	semiannual
MW-48 - Proposed	semiannual	semiannual
MW-49 - Proposed	semiannual	semiannual
MW-50 - Proposed	semiannual	semiannual

Notes:

[1] Monitoring wells will be replaced in post-closure

Prepared by: NMG1
Checked by: HLH

Table 7-2
Post-Closure Surface Water Monitoring Station Locations and Descriptions
White Pine Copper LLC

Surface Water Monitoring Station	Water Body	UTM East	UTM North
Phase 1 Post-Closure Monitoring Locations			
PRC-01	Perch Creek	305474.0013	5186590.0000
PRC-02	Perch Creek	305537.0006	5188208.0000
MLR-01	Mineral River	304225.1577	5178726.7131
MLR-02	Mineral River	304808.8235	5185763.0009
MLR-03	Mineral River	305329.0008	5188236.0000
PNC-01	Pine River	307888.9990	5179045.0000
PNC-02	Pine River	308949.9986	5182769.0000
PNC-03	Pine River	310054.0002	5186867.0000
PNC-04	Pine River	310190.8862	5189985.6746
NTC-01	Native Creek	305905.0005	5189332.0000
ARC-01	Argentine Creek	311216.9998	5179165.0000
ARC-02	Argentine Creek	312235.0005	5183241.0000
ARC-03	Argentine Creek	313026.9532	5187720.4691
DKC-01	Duck Creek	309647.0011	5178892.0000
DKC-02	Duck Creek	311192.9104	5186740.2638
DKC-03	Duck Creek	311739.3494	5189585.7865
MLC-01	Miles Creek	309213.0264	5189220.9582
PTC-01	Patent Creek	306549.9986	5189774.0000
CBR-01	Cranberry River	315971.5206	5178800.3013
CBR-02	Cranberry River	315743.6298	5190016.3351
LKS-01	Lake Superior	307183.9997	5190257.0001
LKS-02	Lake Superior	309589.0011	5190512.0000
Phase 2 Post-Closure Monitoring Locations			
PRC-01	Perch Creek	305474.0013	5186590.0000
PRC-02	Perch Creek	305537.0006	5188208.0000
MLR-01	Mineral River	304225.1577	5178726.7131
MLR-02	Mineral River	304808.8235	5185763.0009
MLR-03	Mineral River	305329.0008	5188236.0000
LKS-01	Lake Superior	307183.9997	5190257.0001
LKS-02	Lake Superior	309589.0011	5190512.0000
PNC-01	Pine River	307888.9990	5179045.0000
PNC-02	Pine River	308949.9986	5182769.0000
PNC-03	Pine River	310054.0002	5186867.0000
PNC-04	Pine River	310190.8862	5189985.6746

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Checked by: HLH

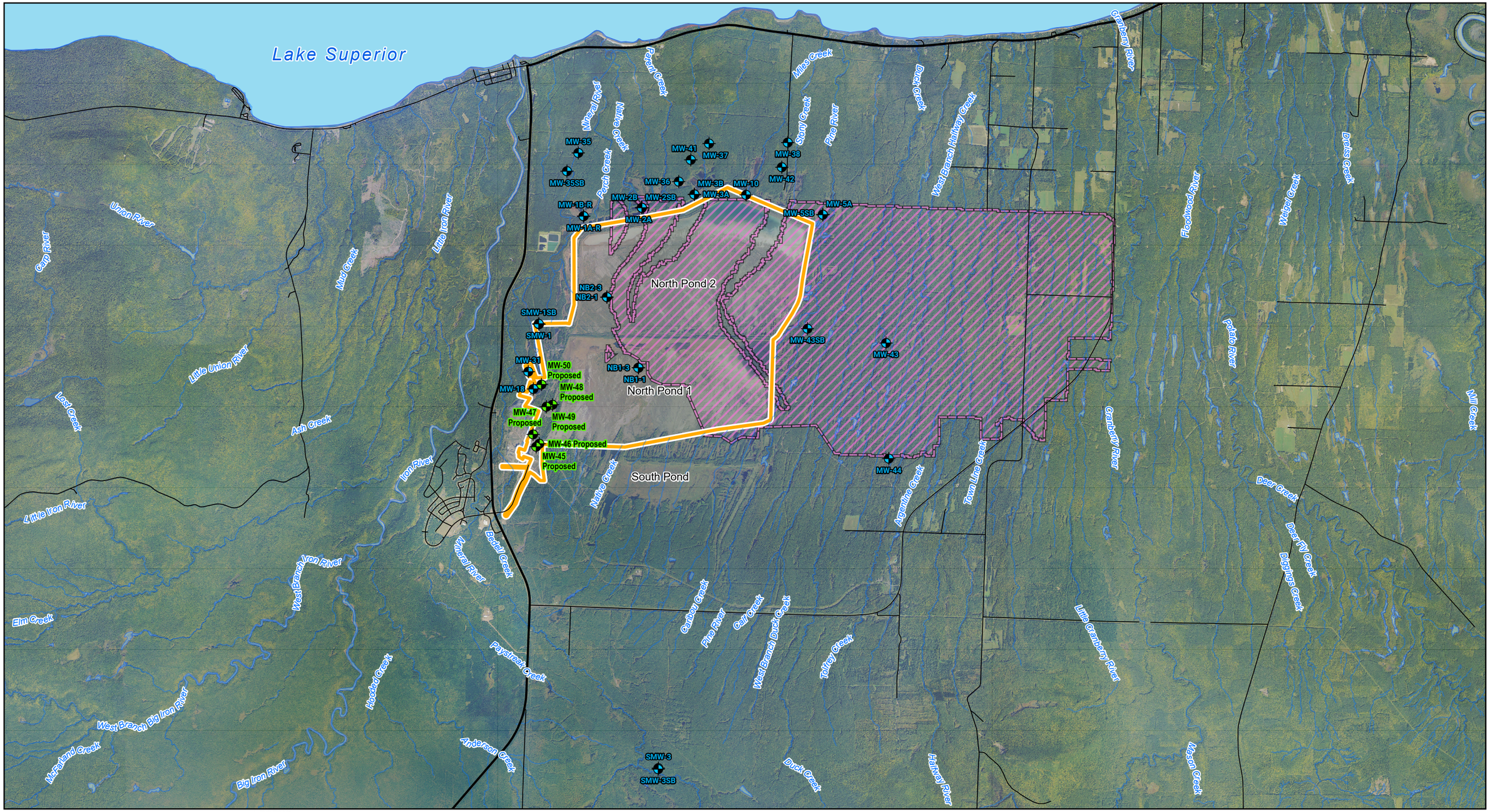
Table 7-3
Post-Closure Mine Facilities Inspection Plan and Schedule
White Pine Copper LLC

Facility Description	Observation/Inspection Items	Inspection Frequency	Corrective Action
Contact Water Pond	1. Clean influent pipes and effluent structures and ditches of debris. 2. Observe stormwater for signs of surface water pollution.[1] 3. Check vegetation on interior and exterior berms. 4. Check for leaks in above ground piping and pumps. 5. Observe and record liquid quantity.	Monthly	1. Replace rusted or damaged piping or effluent structures. 2. Pump contaminated stormwater to the contact water basin. 3. Reseed and provide erosion mat or riprap in eroded areas. 4. Repair leaks and replace defective components.
	6. Check dead storage (i.e., sediment thickness).	Annual	5. Remove sediment if thickness is 1.5 -2.0 feet.
Revegetation Standards with Assessment of Sustainable Growth	1. Inspect vegetation growth in revegetated areas.	Monthly	1. Reseed bare areas or repair vegetation growth as necessary.

Note:
[1] Stormwater pollution is evidenced by color, odor, turbidity, floating solids, and foam or oil sheen.

Prepared by: NMG1
Checked by: HLH

Figures



NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.

LEGEND

- Proposed Groundwater Monitoring Well Locations
- Groundwater Monitoring Well
- Major Road
- Minor Road
- River/Stream
- Lake/Pond
- Proposed Project Surface Extent
- Proposed White Pine North Underground Mine Area

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REVIEWED BY:			DATE:
APPROVED BY:			DATE:

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FIGURE 7-1
POSTCLOSURE GROUNDWATER MONITORING WELL LOCATIONS
ENVIRONMENTAL MONITORING PLAN

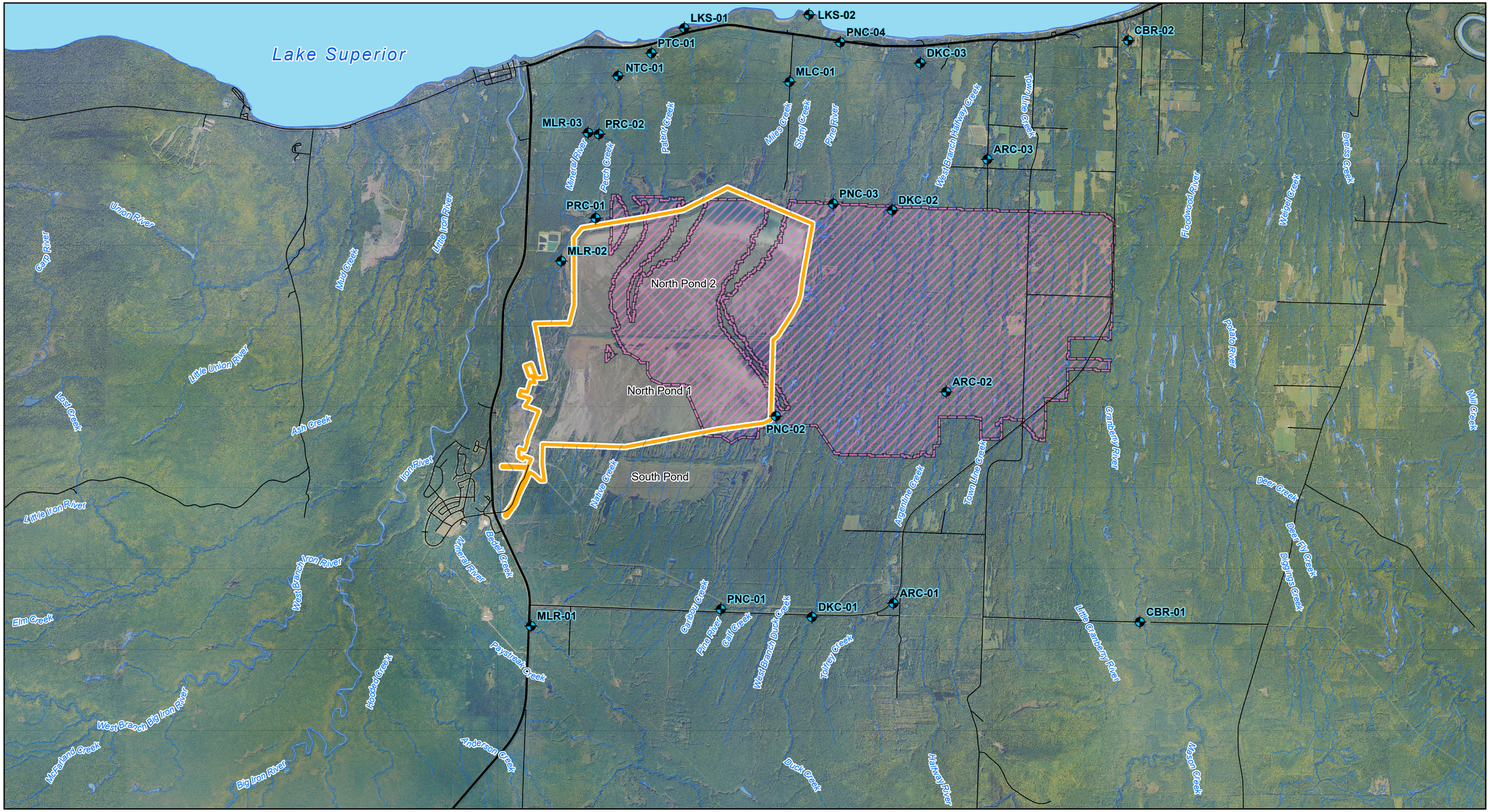
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NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.

LEGEND

- Surface Water Monitoring Location
- Major Road
- Minor Road
- River/Stream
- Lake/Pond
- Proposed Project Surface Extent
- Proposed White Pine North Underground Mine Area

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APPROVED BY:			DATE:

WHITE PINE COPPER LLC

FIGURE 7-2
PHASE 1 POSTCLOSURE
SURFACE WATER MONITORING LOCATIONS
ENVIRONMENTAL MONITORING PLAN

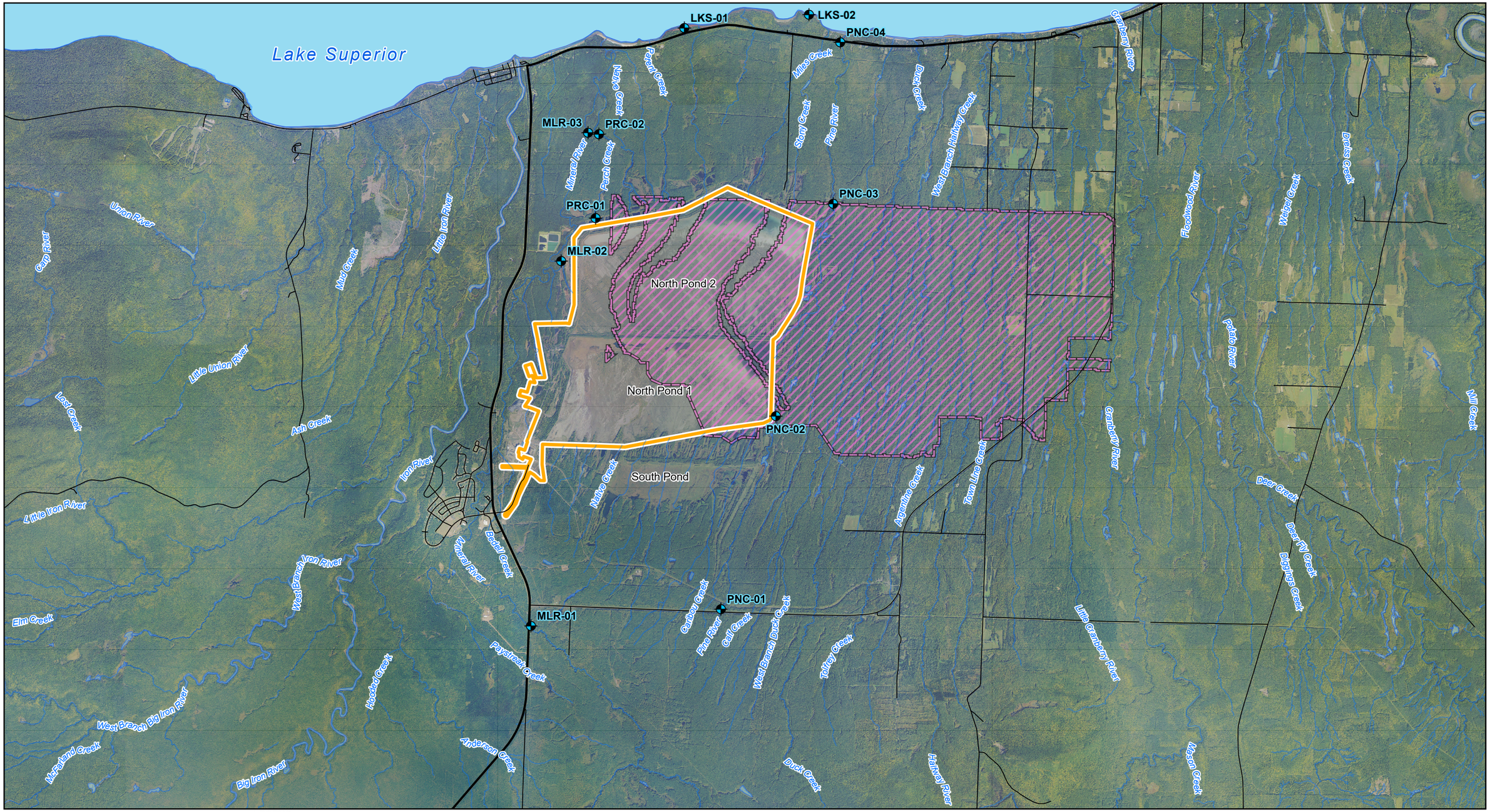
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Project: 25W006

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1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.

LEGEND

- Surface Water Monitoring Location
- Major Road
- Minor Road
- River/Stream
- Lake/Pond
- Proposed Project Surface Extent
- Proposed White Pine North Underground Mine Area

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FIGURE 7-3
PHASE 2 POSTCLOSURE
SURFACE WATER MONITORING LOCATIONS
ENVIRONMENTAL MONITORING PLAN

Scale: 0 3,000 6,000 Feet

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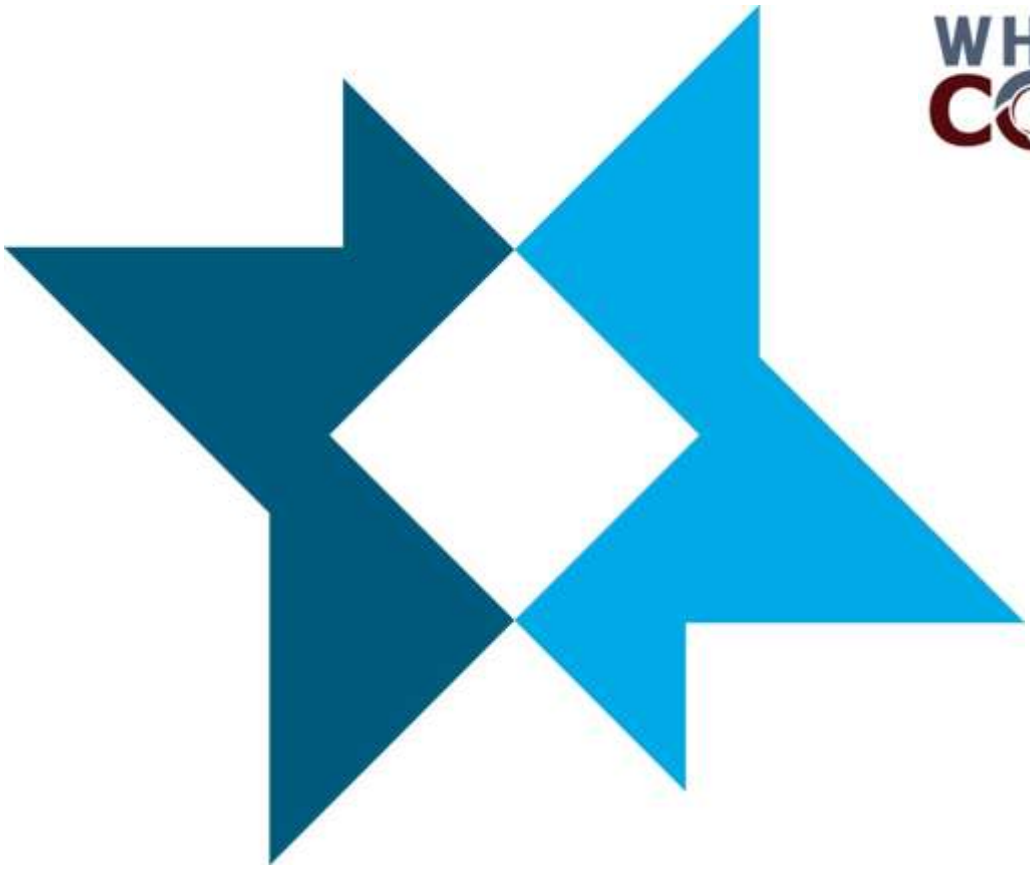
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Appendix G

Reclamation Plan

Reclamation Plan
White Pine North Project



White Pine Copper LLC
White Pine, Michigan

August 2026

Project ID: 25W006

Solving our clients' toughest science and engineering challenges.

Reclamation Plan
White Pine North Project

Project ID: 25W006

Prepared for
White Pine Copper LLC
White Pine, Michigan

Prepared by
Foth Infrastructure & Environment, LLC

August 2026

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Reclamation Plan
White Pine North Project

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Appendices

Appendix A Seeding Restoration Practices
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List of Abbreviations, Acronyms, and Symbols

BMP	Best Management Practices
CWP	Contact Water Pond
EGLE	Michigan Department of Environment, Great Lakes, and Environment
Foth	Foth Infrastructure & Environment, LLC
MPA	Mining Permit Application
NCWP	Non-Contact Water Pond
NP1	North Pond 1
NP2	North Pond 2
NRCS	Natural Resources Conservation Service
Plan	Reclamation Plan
Project	White Pine North Project
TDF	Tailings Disposal Facility
UG Mine	Underground Mine
WPC	White Pine Copper LLC
WPN	White Pine North
WWTP	Industrial Wastewater Treatment Plant

1. Introduction

This Reclamation Plan has been prepared for White Pine Copper LLC's (WPC) White Pine North Project (WPN or Project). In accordance with Michigan's Nonferrous Metallic Mining Regulations – Part 632 Section 324, a Mining Permit Application (MPA) shall contain a Reclamation Plan (Plan). This Plan establishes timelines, sequences, and procedures for the interim and final reclamation of the mining area following the cessation of mining activities. This Plan applies to all mine facilities, including underground workings, surface infrastructure, stockpiles, wastewater systems, tailings or settling areas, and transportation corridors.

1.1 Scope and Summary of Reclamation Plan

Reclamation of the property will consist of flooding of the underground mine (UG Mine), plugging and capping of portal and ventilation raises, final shaping and vegetation of the Tailings Disposal Facilities (TDF) at final deposition, and reclaiming of the Contact Water Ponds (CWP), non-contact water ponds (NCWP), mine/processing plant site infrastructure, soil and ore stockpile areas, and any internal roads not required for post-reclamation use. The final land use of the site will be compatible with existing uses on adjacent properties. This Plan includes the following:

- The final preliminary reclaimed land contours including a drawing showing final topography.
- Design and description of features such as the CWPs, drainage ditches, soil and erosion control features that will remain or be constructed as part of reclamation activities.
- Capping and plugging plan for UG Mine portal and ventilation raises.
- Final deposition grades and vegetation of TDFs.
- The reclamation of roads, stockpiles, and other disturbed areas.
- Plans for closure and reclamation of the processing plant/mill site including deconstruction of buildings, equipment, and structures which are not planned for use during the post-closure period as wells as disposal of chemicals and reagents.
- Regrading and revegetation of disturbed areas to bring about a self-sustaining ecosystem.

1.2 Cessation of Mining Activities R 425.404

If for any reason (closure or otherwise), mining and beneficiation activities cease for a period of 90 days, actions shall be taken to maintain, monitor, secure the mining area and interim sloping and/or stabilizing of surfaces necessary to protect the environment, natural resources, or public health and safety.

Final reclamation of the mining area shall begin within approximately 3 years of the date of cessation of mining and beneficiation activities and shall be completed within the time frame outlined in this document, as part of the MPA. Where possible, reclamation activities shall be performed concurrently with the mining operation.

2. Reclamation Planning R 425.204

This Plan describes the timeline of mining activities and subsequent closure and post-closure sequences that should be implemented to achieve site reclamation. In addition, a description of closure planning and post-closure measures are detailed in the sections that follow. Additional information on closure procedures are discussed in the MPA as well as the Contingency Plan and Environmental Impact Assessment.

2.1 Anticipated Schedule, Sequencing, and Duration

Reclamation activities for the proposed development will commence concurrently with initial construction activities at the site and continue through phase facility closures and into the post-closure care period. A phased sequencing plan will be established based on different site development phases as presented in Table 2-1. Figure 1 shows a timeline of reclamation activities. Table 2-2 lists significant activities associated with each reclamation phase.

Phase 1 – Concurrent with Construction
Phase 1 Reclamation will occur concurrently with site construction activities and will commence beginning in Mine Year -3. Reclamation activities will consist of restoration of areas disturbed during site construction as soon as practical after construction is completed in areas of the site. The majority of work will consist of regrading for stormwater management and revegetation of disturbed areas. Overburden or excess soil stockpiles will be temporarily seeded and stabilized. Figures 2A and 2B show the areas of reclamation that would occur during Phase 1.

Phase 2 – Operations
Phase 2 Reclamation will occur during underground mine operation (Mine Years 1 through 26) and will include restoration of areas which are no longer used by mine applications. This phase will involve mainly regrading and revegetation with phased closure of the temporary ore stockpile, management of soil stockpiles. Ongoing construction during operations includes work on causeway raising and embankment crest widening within TDFs. Figures 3A through 3C show the areas of reclamation that would occur during Phase 2.

Phase 3 – Project Closure
Phase 3 Reclamation will occur when all mining activities cease and Project closure begins (Mine Years 27 through 31). At the end of completion of Phase 3, all final reclamation for the Project would be complete with the plugging of the portal, ventilation raises, and deconstruction of the processing plant. The industrial wastewater treatment plant (WWTP) and associated piping will continue to operate until Mine Year 31 before deconstruction. Figures 4A and 4B illustrate the site at completion of Phase 3 Reclamation.

Phase 4 – Post-Closure Monitoring and Maintenance
Phase 4 Reclamation begins in Mine Year 32 following the closure of the Project and cessation of all site activities. Figures 5A and 5B illustrate the site layout at the end of Phase 4.

2.2 Effectiveness of Proposed Methods, Materials, and Techniques

All proposed methods, materials, and techniques described in this document are consistent with Best Management Practices (BMP) in the opinion and experience of qualified persons.

3. Reclamation Activities

3.1 Reclamation Concurrent with Mining Operations R 425.203 (c)(xxiii)

During site construction and operations, reclamation activities will be performed concurrently for disturbed areas within the Project area that are deemed no longer needed to support construction and/or operations. Reclamation of these areas will include proper grading and applying seed mixes and mulching to promote vegetation and stabilization of disturbed areas. Storm water management facilities including grading, ditching, and detention basins will be constructed at the start of construction. Silt fences, wetland barrier fencing, and other erosion control devices will be installed as necessary. See MPA, Appendix E for additional erosion and sediment control plan information.

3.2 Final Land Contours R 425.204 (a)(i)

The preliminary final site land contours after reclamation are shown on Figures 5A and 5B. The contour plan is based on property end use that is consistent with pre-development topography, final TDF consolidation elevations, and existing and long-term stormwater features and drainage patterns. Final contours around facilities outside the Project area adjacent to the site are not planned to be altered or changed. Final contours will be provided prior to reclamation.

3.3 Final Land Use and Surrounding Areas R 425.204 (a)(ii)

The existing land use in and around the Project area includes wetlands, wooded areas, wooded areas, homes, and industrial use. The surficial land use within the Project area will change to support operations and should not affect surrounding land areas. The final land use of the site will be as similar as possible to pre-development land use, consistent with local zoning regulations. The land within the Project area will be returned nearly to its original topographical and ecological state, with some variations to account for existing brownfield structures being removed and to account for structures to remain during post-closure as shown on Figures 5A and 5B.

3.4 Remaining Surface Features After Completion of Reclamation R 425.204 (a)(iii)

The existing site is considered a Brownfield and is being redeveloped as part of the Project. The site will be returned to its pre-development land use as much as possible, however, several features will remain in place following reclamation. These include the reclaimed underground mine and portal and ventilation raises, TDFs North Pond 1 (NP1) and North Pond 2 (NP2), and some site civil and surface water management structures present after reclamation. In addition, pre-existing features including the South Pond TDF and Waste Repository will continue to be maintained. Site features to remain on the property after reclamation are shown on Figures 5A and 5B.

Reclaimed Mine, Portal, and Ventilation Shafts

Following the cessation of mining, all equipment, materials, and non-inert utilities will be decommissioned and removed from the underground mine. All conveyance and mobilization equipment will be removed, leaving only embedded foundations within the underground room and pillar network. The UG Mine will be rapidly reflooded using water from Lake Superior

provided by an existing nearby supply pipeline from a pump station in Silver City. Final flooding details will be prepared prior to reclamation.

Tailings Disposal Facilities/TDF NP1/TDF NP2
The existing TDFs NP1, NP2, and South Pond are in place from legacy site operations and will remain as surface features post-closure. The final configuration of NP1 and NP2 will incorporate consolidated tailings on each TDF. Prior to deposition, the tailings will be sent through a thickener to increase percent solids. Per the deposition plan, required berms, maintenance roads, and stormwater management structures within NP1 and NP2 will be constructed using waste rock, legacy tailings, or clay from the South Pond embankment.

TDF facilities will be closed during Mine Years 12 and 26 (NP1 and NP2 respectively) with a final deposition scheme resulting in surfaces sloped from south to north to reclaim contact water pond. The contact water ponds will be drawn down to facilitate tailings drainage with contact water sent to the WWTP for treatment or use with operations as reclaim water at the processing plant. Additional grading using portions of the deposition area material will be completed at closure for surface water drainage towards spillways and reclaim basins to prevent ponding water. Additional closure details are described in the MPA, Appendices D and H.

Surface Water Management Controls
After the cessation of mining (Mine Year 26), the remining CWPs will remain in place for 5 years. Once CWPs within TDFs NP1 and NP2 reach water quality standards, the CWPs will be transitioned to NCWPs for stormwater conveyance with spillways constructed. The lined main CWP will be drained through the WWTP prior to the liner being disposed of and discharge spillway modified. The process plant area CWP will be drained as well and the liner system disposed of before the outlet structure is modified for surface discharge of stormwater. The two CWPs within the TDFs will be discharged through the existing NP2 spillway and water management system and discharged to Perch Creek at existing outfall 001. Existing on-site NCWPs and drainage ways will remain on site indefinitely.

Industrial Wastewater Treatment Plant
The WWTP, utilities, and conveyance and discharge pipelines will remain in place for a period of 5 years following mine cessation to treat discharge from CWP and tailings facilities. Following water quality monitoring milestones, the WWTP and associated facilities will be removed from the site (Mine Year 31).

Site Access and Roads
After the initial closure period (Phase 3), site access will be maintained for the purpose of accessing the TDF facilities, WWTP, power utilities, CWP, NCWPs, and groundwater monitoring wells. Access to the underground mine for rapid reflooding will remain in place until requirements are met. Upon closure of the WWTP, select access roads will no longer be needed and will be removed, regraded, and revegetated. Access roads to environmental monitoring points will remain through Phase 4 of this Plan.

Soil Stockpiles
Excess soils stockpiled during Phase 1 will be seeded to maintain viability and prevent sediment migration through stabilization. Stockpiles will be drawn down in small quantities during Phase 2 as final grading material during revegetation efforts and closure of the temporary ore

stockpile. The majority of material will be removed during Phase 3 and used as final grading material and topsoil. A small quantity of material will be maintained through Phase 3 for final grading and revegetation of the WWTP, and CWPs, and remaining access roads when they are removed in Mine Year 31. At that time, the final grading and vegetation of the stockpile areas will be completed.

3.5 Stabilization of Site Stabilization Features R 425.204 (a)(iv)(A)(B)(C)

3.5.1 Underground Mine Infrastructure, Portal, Declines, and Ventilation Raises

The new underground mine consists of an entrance portal, two declines, room and portal network, and three ventilation raises (one fresh air, two exhaust). The final reclamation will include:

- Removal of all non-inert infrastructure and equipment;
- Rapid flooding of the underground mine network;
- Bulkhead installation at each decline;
- Bulkhead and capping of each ventilation raise;
- Bulkhead, steel arch removal, and capping of portal; and
- Installation of security fencing and restricted access measures; and
- Final contouring, grading, and revegetation.

3.5.2 Tailings Disposal Facilities

The TDFs will be revegetated consistent with requirements from legacy tailings deposited during prior mine activities. Revegetation will be extended across the remaining in-place tailings deposited during and after tailings consolidation in order to provide vegetative cover sufficient to control generative of any fugitive dusts. The overall planting density will be sufficient to control and minimize transport and migration of suspended solids from precipitation events on the tailings surface.

3.5.3 Temporary Ore Stockpile Pad

Following reclaim of ore contained on the temporary ore stockpile pad, the location will be used for management of contact water generation and snow melt containment from site roadways. At the end of mining operations, the drainage layer, pad liner system, and leak detection system infrastructure will be removed and disposed of at a licensed facility. Following liner removal, underlying soils will be graded to shed non-contact water to existing stormwater management systems.

3.5.4 Contact Water Ponds

Operations CWPs will remain receiving and managing contact water through operations and into Mine Year 26 and then through Mine Year 31. Upon contact water quality standards being met, the CWPs will be modified and liners removed. The basins will be returned to preconstruction conditions and serve to manage non-contact water conveyance. See Figures 3A through 3C for operational CWP phasing. Additional details on water management detailed elsewhere in this Project application.

3.5.5 Roads

All mine traffic access roads will be removed except those noted on Figure 5A. Some essential roadways for maintaining the WWTP, supporting the Environmental Monitoring Plan operations, and long-term post-closure support will remain in place. As part of road removal, all surfacing and ditching that handled mine vehicle traffic will be removed down to base materials and disposed of at a licensed facility. Roads to remain will be reshaped and graded as necessary to promote surface water drainage. Roadside ditches will be topsoiled and rerouted as necessary for stormwater management.

3.5.6 Buildings and Structures

All erected structures will be deconstructed and removed except for the WWTP and its supporting structures; which will be removed later in Mine Year 31. Structural foundations will be demolished to provide surface stabilization following grading exercises. Some aspects of the concrete foundations will remain where concrete footings, and frost walls are broken apart and buried. All above ground infrastructure will be removed from site and recycled, repurposed, or disposed of at a licensed facility.

3.5.7 Power and Utilities

Overhead lines through the site will be removed and conductors recovered for reuse or recycling. Overhead lines serving other entities within the industrial area will remain in place. The natural gas turbines will be removed from site for reuse or recycling after operations are complete. On-site power distribution lines and equipment will be removed. The power substation will remain until equipment demolition is complete. The natural gas turbine will remain until operations are complete.

3.5.8 Overburden and Soil Stockpiles

Overburden and excess soils from site development activities will initially be stockpiled with 2:1 side slopes. Silt fences will be placed at the toe of slopes to catch any silt or sediment runoff. During the mine operational period (Phase 2), the stockpiles will be seeded to maintain suitability for use in closure, to prevent erosion, and to minimize silt runoff or migration on the site. A portion of excess soil and topsoil stockpiles will be utilized for closure of the temporary ore stockpile. The majority of the overburden material will be used during Phase 3, the overburden and topsoil stockpiles will be used for site restoration. A small amount of topsoil will remain until completion of Phase 4 reclamation activities.

3.5.9 Soil Borrow Areas

Borrow soils from the South Pond embankment will be excavated, hauled, and placed as earthwork material for new berms, contact and non-contact water separation, and access road materials within the TDFs. Following soil borrow activities, the north berm will be shaped for stormwater management, topsoiled, and revegetated.

3.5.10 Topsoil Replacement

Topsoil replacement will occur over each graded and reclaimed area of the site. The topsoil material will be natural on-site topsoil stockpiled from initial site development as well as off-site imported material as necessary. Initial replacement will occur during Phase 1 Reclamation and

Phase 2 Reclamation in minor amounts, followed by the majority of replacement in Years 28 through 30 (Phase 3 Reclamation). After surface facilities have been removed and regraded, final topsoil placement will occur. Phase 4 will occur in Mine Year 31 when the WWTP, CWPs, and natural gas turbine building areas will be removed and areas regraded and topsoiled. Topsoil will be placed and graded across disturbed areas approximately 10 centimeters thick or as consistent with predevelopment thickness. Placement of topsoil and grading will be conducted using scraper and dozers.

3.6 Reclamation Performance Standards R 425.204 (b)

3.6.1 Final Deposition of Toxic and Hazardous Wastes R 425.204 (b)(i)

Any toxic or hazardous waste produced during construction, operations, closure and post-closure periods will be handled and transported in accordance with all applicable laws and regulations both state and federal.

3.6.2 Tailings and Waste Rock

Tailings will be permanently secured in the NP1 and NP2 TDFs per the timeline shown on Figure 1. All waste rock obtained from the mine development will be deposited in NP1. See MPA, Appendix D for additional plan information on stabilization of tailings and waste rock materials.

3.6.3 Refuse and Other Solid Waste

Any refuse, solid waste, or contaminated soils encountered or recovered during initial construction will be characterized and shipped off site to an approved licensed disposal facility. Any refuse or waste materials encountered during reclamation or produced during the closure and post-closure period will be handed in similar manor.

3.6.4 Closure of Openings R 425.204 (b)(ii)

Shafts, portals, and other openings from the land surface to the underground mine workings will be sealed following operations. Closure will follow a sequenced order to protect site infrastructure and personnel with final closure of the mine portal. Openings will be sealed in a manner to protect the environment, natural resources, and public health and safety.

Air intake and vent shafts will be plugged and filled to prevent access. Closure methods to include concrete plugging and filling with soil and aggregate materials to the surface elevation. At the surface, the remaining opening will be capped with finer grained aggregate and vegetated. A secondary plug may be included at each shaft location depending on depth and configuration of the lower plug configuration. Final opening capping plans will be submitted prior to closure.

The portal will remain until underground mine reclamation is completed. The portal will be plugged with concrete and filled soil and aggregate materials. The entrance to the portal will be sealed with finer aggregate, topsoiled, and vegetated. Final portal capping plans will be submitted prior to closure.

3.6.5 Removal or Alternative Final Use of Surface Structures, Infrastructure, Rock Stockpiles, and Tailings Disposal Areas R 425.204 (b)(iii)

Nearly all surface buildings and structures will be razed following operations during reclamation activities. Materials will be loaded and hauled off site to an approved off-site facility for disposal.

The only remaining structures will be the TDFs (NP1, NP2 to be graded and revegetated and South Pond), abandoned portal, abandoned ventilation shafts, access roads, and permanent surface water management systems and controls.

3.6.6 Stabilization of Surface Areas to Prevent Erosion R 425.204 (b)(iv)

During the life of the mine, erosion control practices will be implemented continuously through construction, operations, and closure. Erosion control will be employed in accordance with Part 91 of Act 451 of the *Natural Resources and Environmental Protection Act 1994 (Mich.)*, that is, where, "an earth change has been made that may result in or contribute to soil erosion or sedimentation of the waters of the state [owner] shall implement and maintain soil erosion and sedimentation control measures that will effectively reduce soil erosion nor sedimentation from the land on which the earth change has been made". Erosion control measures outlined in the MPA, Appendix E will be applied during reclamation. During reclamation, erosion control practices will include:

- Application of mulch to ground cover areas;
- Installation of silt fences;
- Installation of straw bale ditch check dams or rock filled gabions in drainage ditches;
- Using of sufficiently sized riprap in ditches to reduce water velocity; and
- During reclamation, temporary silt control basin(s), as needed, could be constructed to contain surface water runoff. These structures will be strategically placed during final site grading to better control surface water runoff during site reclamation activities. After completion of site grading, the temporary basins will be filled in and restored to surrounding topography.

Further presentation of the Project surface water management systems and erosion controls are provided under the MPA, Appendix D-3, Water Management Plan, and Appendix E, Soil Erosion and Sedimentation Control Plan.

3.6.7 Revegetation Per R 425.204 (a) iv (C) and (b)(v),

Disturbed areas during construction and operational periods (Phase 1 and Phase 2) will be revegetated following activities. Disturbed areas will be topsoiled, seeded, and mulched. A fertilizer will be applied to promote vegetative growth based on soil tests. Topsoiled areas will be seeded at a rate of 220 pounds per acre with either Michigan Department of Transportation seed mix. The remainder of site revegetation, during Phases 3 and 4, will include indigenous grasslands and meadow species to the area with the goal to promote a self-sustaining plant community consistent with existing vegetation. Seeding will be performed using one or a combination of the following methods; broadcast, hydro-seeding, or drill seeding. Native grass

planting procedures will follow those outlined in the Natural Resources Conservation Service (NRCS) Conservation Practice Standard code 327 with consideration for planting schedules detailed in the Native Grass Planting Conservation Reserve Enhancement Program, CRP-CP2. Copies of each of these respective documents are provided in Appendix A.

Tailings facility NP1 will be revegetated following ceasing deposition activities in Phase 2 and NP2 will be revegetated following mining operations in Phase 3. Tailings facilities will be revegetated similar to the prior historic closure. Revegetation will primarily consist of native grasses.

Figure 2A through 4B detail approximate areas of revegetation per reclamation phase. Topsoil will be sourced on site or off site as necessary. Soils tests will be performed to analyze for properties such as pH, nitrogen, and organic content to determine appropriate fertilizer selection and application rates.

3.6.8 Restoration of a Self-Sustaining Ecosystem R 425.204 (b)(vi)

The site contains a variety of landforms, aquatic habitats, and terrestrial habitats along with existing industrial infrastructure such as the TDFs and surface water management facilities. Additional industrial facilities located in close proximity to the site are owned and operated by third parties. Habitats include, but not limited to, the following:

- Landforms: Historically disturbed landscape due to prior industrial operations include developed and unvegetated land cover areas. The Mineral River and M-64 bound the Project area to the west with wetland communities and several creeks bordering the south, east, and north.
- Aquatic habitats: the Mineral River, Perch Creek, Duck Creek, Portal Creek, Pine Creek, historical tailing ponds and a series of wetland features.
- Terrestrial Habitats: Mesic Northern Forest, Upland Meadow, Northern Hardwood Swamp, Northern Shrub Thicket, Northern Wet Meadow, Emergent Marsh, and Submergent Marsh.
- Industrial Areas: Adjacent to the Project site there are businesses and utilities owned and operated by third parties, including the Village of Ontonagon potable water treatment plant and infrastructure.

Restoration of the site will return conditions to approximate pre-project conditions wherever possible with the additional reclamation activities noted in this Plan.

4. Post-Closure Water Monitoring R 425.204 (c)

The post-closure groundwater and surface water monitoring plans are presented in the facility Environmental Monitoring Plan, MPA, Appendix F. A summary of monitoring actions is as follows:

- Monitoring for approximately 20 years following completion and approval of reclamation activities.
- Groundwater gauging and sampling throughout post-closure period, with reduced frequency upon approval from the Michigan Department of Environment, Great Lakes, and Energy (EGLE).
- Surface water sampling and elevation measurements throughout the post-closure period, with reduced frequency upon approval from EGLE.
- Mine facilities monitoring for post-closure inspections and preventive maintenance.
- Sampling, data collection, and analysis procedures will be consistent with those during operation.

5. Names and Qualifications of Reclamation Plan Preparers

Per R 425.204 (d), the names of the qualified persons who prepared this Reclamation Plan are listed in Table 5-1.

6. Reference

Natural Resources and Environmental Protect Act, 1994 (Mich) Act 451 Part 91 “Soil Erosion and Sedimentation Control” (USA).

Tables

Table 2-1
Reclamation Sequence

Phase	Event	Mine Year
1	Site Construction	-3 to 0
2	Operation	0 to 26
3	Closure Reclamation	27 to 31
4	Post-Closure	32 to 51

Prepared by: DJM4

Checked by: SVD1

Table 2-2
Reclamation Activities

Phase	Event	Mine Year(s)	Reclamation Activity
1	Site Construction Reclamation	-03 through 0	- Main site: grade, seed vacant disturbed areas - Access Road: seed disturbed areas between shoulder and ROW - Topsoil, seed TDF embankments and impacted buttress/crest areas - Seed soil borrow areas - Seed soil stockpiles
2	Reclamation Concurrent with Operations	0 through 26	- Main site: grade, seed vacant disturbed areas during continued site development - Temp ore pad removal, grading, and restoration - Removal and desposition of legacy slag materials - Topsoil and seed soil and overburden stockpiles - Topsoil and seed soil processing area - Grade and seed intermediate NP1 TDF area
3	Closure Reclamation	27 through 31	- Closure, grading, and seeding of TDF NP1 and NP2 - Removal of UG Mine and Area infrastructure - Rapid reflooding of UG Mine, decline bulkheads, and portal bulkhead - Mine ventilation shaft closure and bulkhead installation - Remove site structures no longer needed - Complete site final grading - Seed and mulch disturbed areas - Install erosion control features - Remove mill equipment, buildings, and infrastructure - Remove site utilities - Remove WWTP, CWPs, and electrical generator equipment - Install post-closure monitoring devices
4	Post-Closure Reclamation	31 through 51	- Conduct incidental grading - Install erosion control features - Seed and mulch remaining disturbed areas

Notes:
CWP = Contact Water Pond
TDF = Tailings Disposal Facility [North Pond 1 (NP1) and North Pond 2 (NP2)]
WWTP = industrial wastewater treatment plant

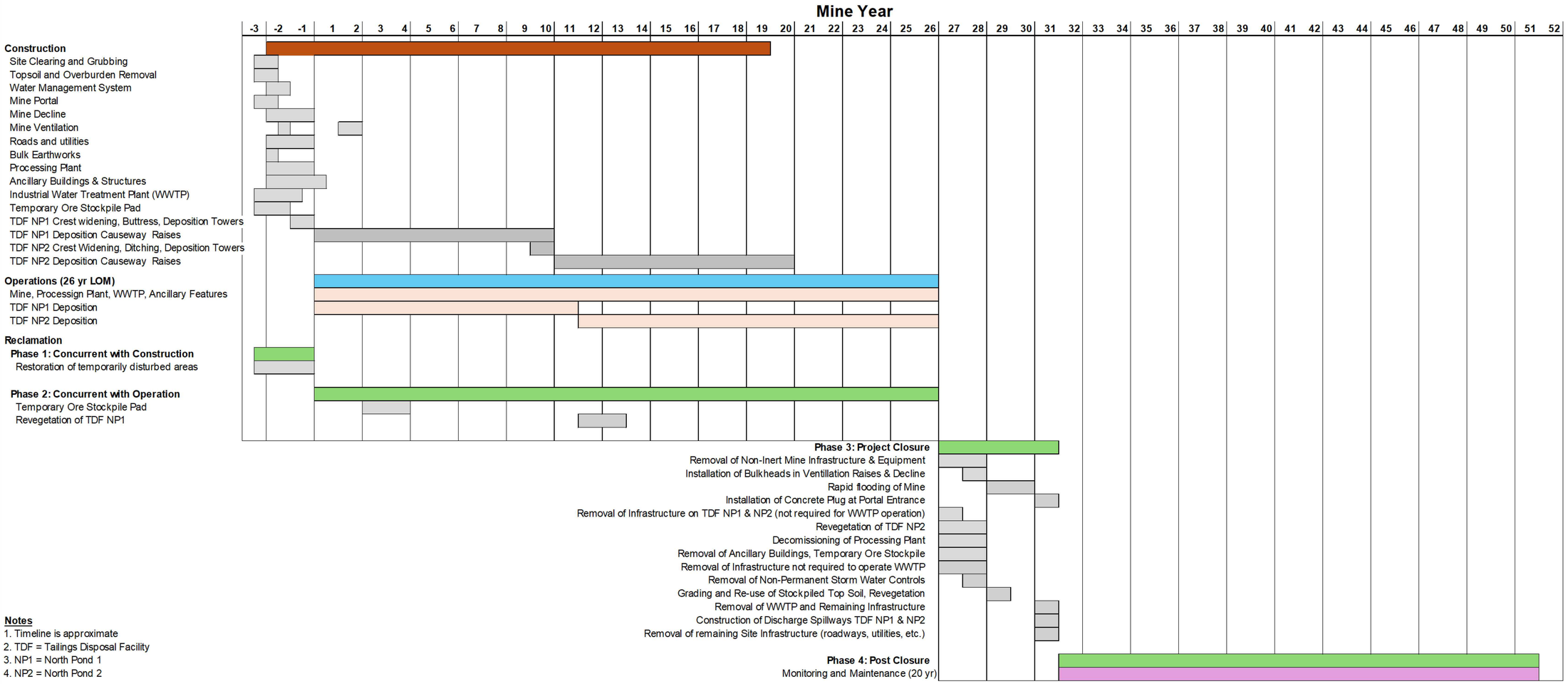
Prepared by: DJM4
Checked by: SVD1

Table 5-1
Qualified Persons

Name	Qualification	Title
Nick Glander	Project Scientist	Lead Environmental Scientist
Clinton Roberts	Project Manager	Project Manager
Matt Grotte	Professional Geologist	Project Environmental Scientist
Steve Donohue	Profesional Engineer	Technical Advisor
Dan Michiels	Professional Engineer	Senior Environmental Engineer Leader

Prepared by: DJM4
Checked by: SVD1

Figures



Notes

1. Timeline is approximate
2. TDF = Tailings Disposal Facility
3. NP1 = North Pond 1
4. NP2 = North Pond 2

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DESIGNED	DJM4	JULY 2026
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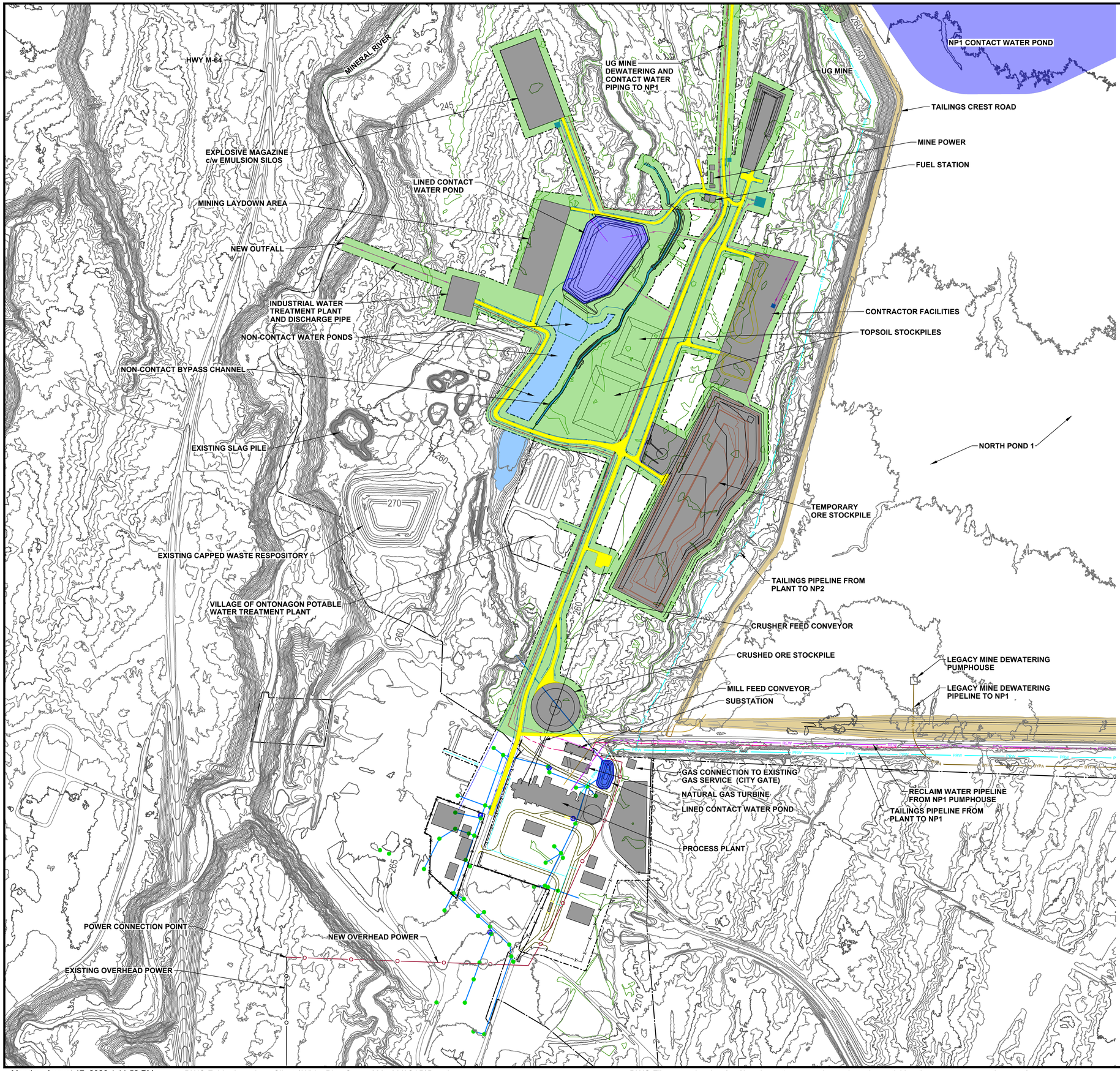
OVERALL PROJECT TIMELINE

RECLAMATION PLAN

PROJECT NO: 23W200

FIGURE NUMBER

FIGURE 1



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- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- PROPOSED ROAD
- NEW 13.8kV UNDERGROUND LINE
- NEW 13kV OH LINE
- NEW 69kV LINE
- PROPOSED WATER LINE
- NEW DISCHARGE PIPE
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- DISCHARGE PIPING
- RECLAIM WATER PIPELINE
- TAILINGS PIPELINE
- FORMER MINE DEWATERING PIPELINE
- TEMPORARY ORE STOCKPILE
- PHASE 1 BUILDING
- PHASE 1 SEEDING AREAS
- CONTACT WATER POND
- CONTACT WATER SUMP
- NON-CONTACT WATER POND
- PHASE 1 CREST WIDENING
- PHASE 1 CONSTRUCTION GRADING

NOTES:

1. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
2. HYDROGRAPHIC FROM USGS.
3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. LEGACY MINE DEWATERING DISCHARGE TO BE ROUTED TO NP2 DURING CONSTRUCTION.

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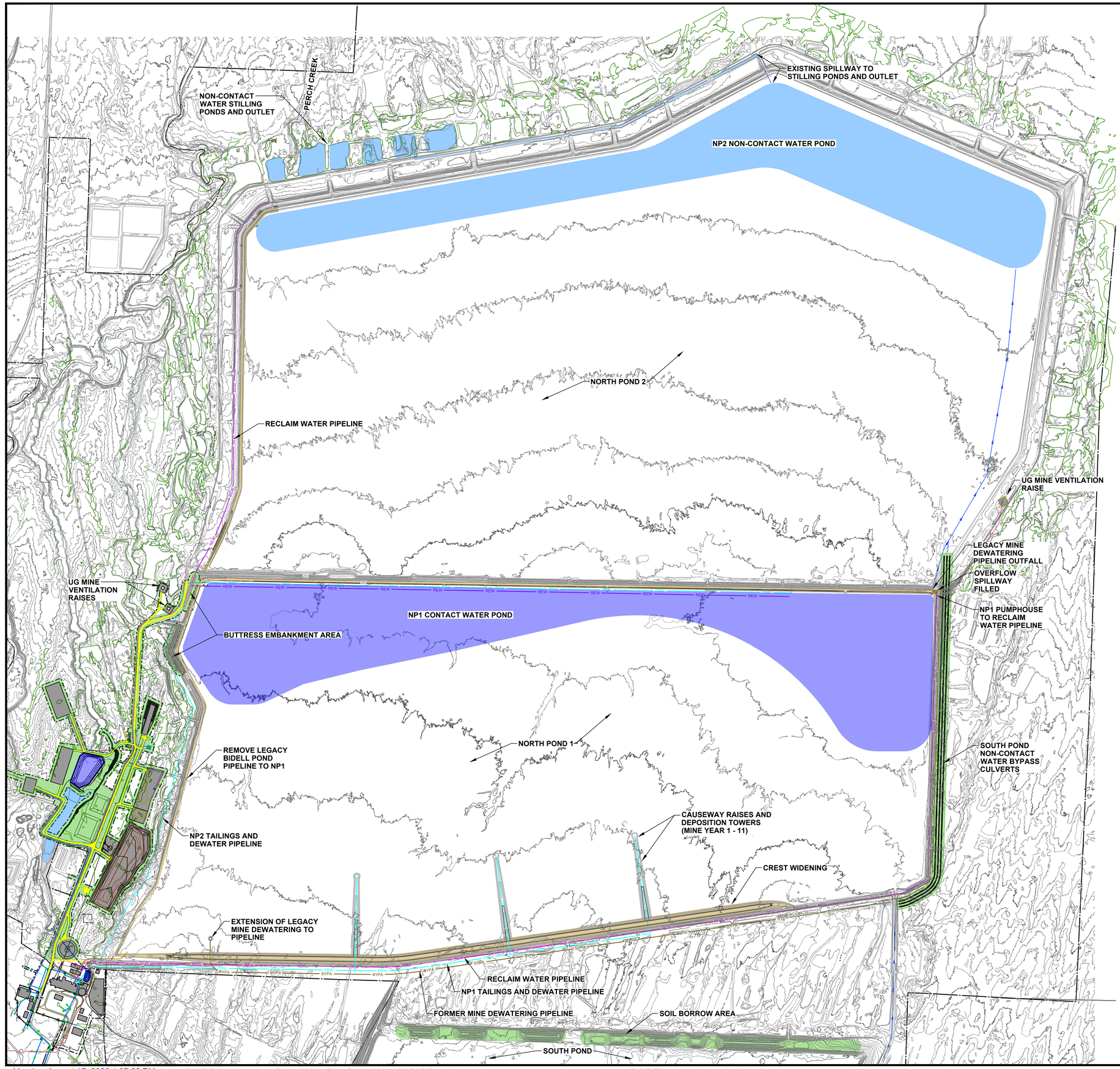
PHASE 1 - CONSTRUCTION RECLAMATION ACTIVITIES MINE YEAR -3 TO 0

RECLAMATION PLAN

PROJECT NO: 23W200

FIGURE NUMBER

FIGURE 2A



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- PROPOSED ROAD
- NEW 13.8kV UNDERGROUND LINE
- NEW 13kV OH LINE
- NEW 69kV LINE
- PROPOSED WATER LINE
- NEW DISCHARGE PIPE
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- DISCHARGE PIPING
- TEMPORARY ORE STOCKPILE
- RECLAIM WATER PIPELINE
- TAILINGS PIPELINE
- FORMER MINE DEWATERING PIPELINE
- PHASE 1 BUILDING/INFRASTRUCTURE
- PHASE 1 SEEDING AREAS
- CONTACT WATER POND
- CONTACT WATER SUMP
- NON-CONTACT WATER POND
- PHASE 1 CREST WIDENING
- PHASE 1 CONSTRUCTION GRADING

NOTES:

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4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. SEE WATER MANAGEMENT FIGURES FOR ADDITIONAL SURFACE WATER MANAGEMENT PHASING DETAILS.
7. LEGACY MINE DEWATERING DISCHARGE TO BE ROUTED TO NP2 DURING CONSTRUCTION. NP1 SURFACE WATER TO BE TREATED AS CONTACT WATER IN PHASE 2.

125 0 125 250 375 500 625 750 875 1,000m

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DESIGNED	DJM4	JULY 2026
CHECKED	DJM4	JULY 2026

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PHASE 1 - CONSTRUCTION RECLAMATION ACTIVITIES NORTH POND 1 & 2 MINE YEAR -3 TO 11

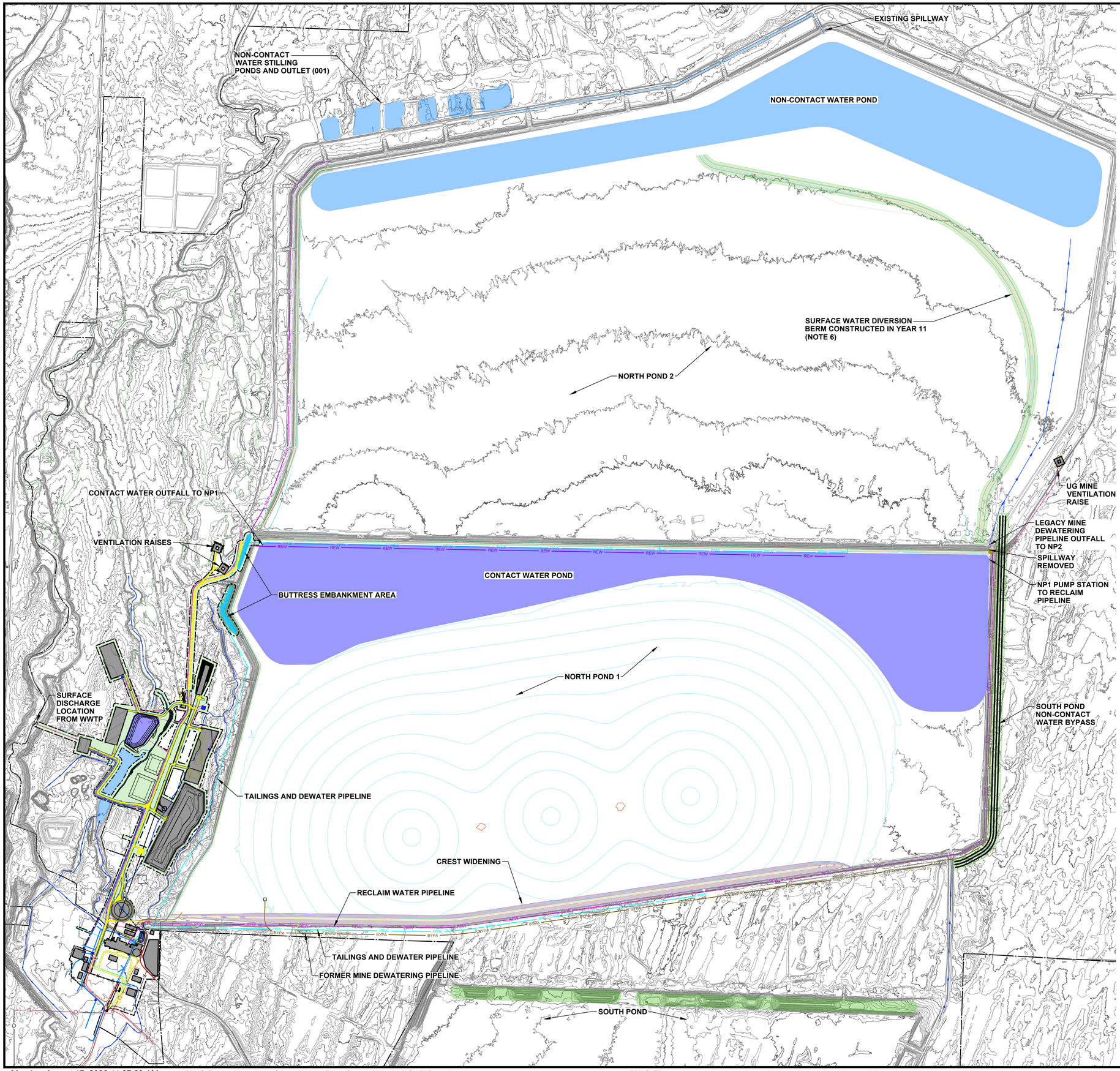
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FIGURE NUMBER

FIGURE 2B

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LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- PROPOSED ROAD
- NEW 13.8kV UNDERGROUND LINE
- NEW 13kV OH LINE
- NEW 69kV LINE
- PROPOSED WATER LINE
- NEW DISCHARGE PIPE
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- DISCHARGE PIPING
- RECLAIM WATER PIPELINE
- TAILINGS PIPELINE
- FORMER MINE DEWATERING PIPELINE
- PHASE 1 BUILDING
- PHASE 2 SEEDING AREAS
- CONTACT WATER POND
- NON-CONTACT WATER POND
- TDF CREST WIDENING
- TAILINGS DEPOSITION CONTOUR
- TAILINGS DEPOSITION CONTOUR (DEPRESSION)
- PHASE 1 CONSTRUCTION GRADING

NOTES:

1. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
2. HYDROGRAPHIC FROM USGS.
3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. SURFACE WATER DIVERSION AND DITCH ROUTING CONSTRUCTED IN MINE YEAR 11 IN ADVANCE OF NP2 DEPOSITION, YEARS 12-26.

125 0 125 250 375 500 625 750 875 1,000m
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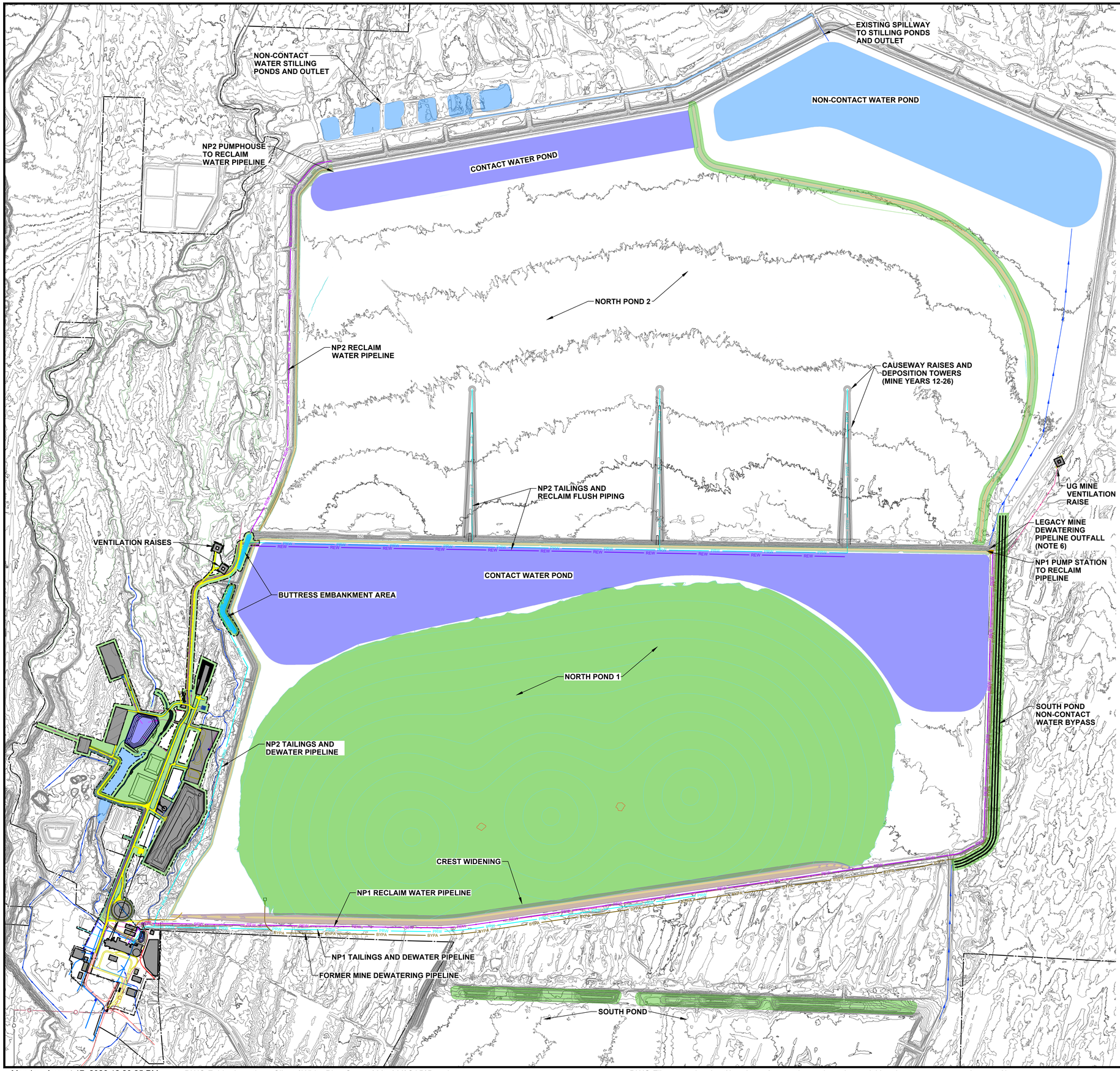
PHASE 2 - OPERATION RECLAMATION ACTIVITIES MINE YEAR 1-11

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FIGURE NUMBER

FIGURE 3A



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- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- PROPOSED ROAD
- NEW 13.8kV UNDERGROUND LINE
- NEW 13kV OH LINE
- NEW 69kV LINE
- PROPOSED WATER LINE
- NEW DISCHARGE PIPE
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- DISCHARGE PIPING
- RECLAIM WATER PIPELINE
- TAILINGS PIPELINE
- FORMER MINE DEWATERING PIPELINE
- PHASE 1 BUILDING
- PHASE 2 SEEDING AREAS
- CONTACT WATER POND
- NON-CONTACT WATER POND
- PHASE 1 TAILING ROADS
- TAILINGS DEPOSITION CONTOUR
- TAILINGS GRADING CONTOUR (DEPRESSION)
- PHASE 1 CONSTRUCTION GRADING

NOTES:

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3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. NP1 AND NP2 CONTACT WATER POND PUMPED TO RECLAIM WATER DURING THIS PERIOD.
7. NP1 INTERIM SEEDING AND GRADING FOLLOWING DEPOSITION.

125 0 125 250 375 500 625 750 875 1,000m

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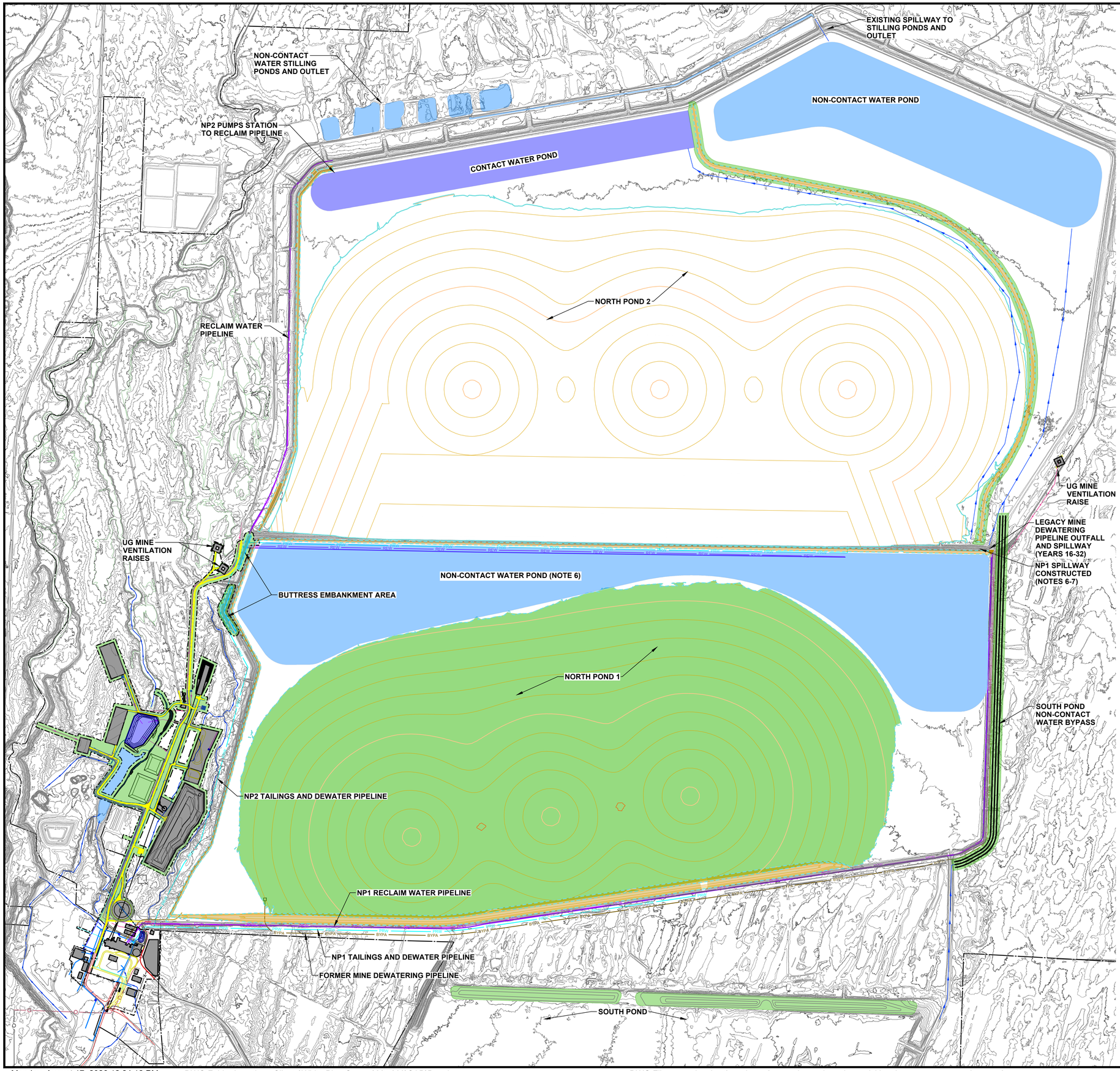
PHASE 2 - OPERATION RECLAMATION ACTIVITIES MINE YEAR 12-16

RECLAMATION PLAN

PROJECT NO: 23W200

FIGURE NUMBER

FIGURE 3B



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- PROPOSED ROAD
- NEW 13.8kV UNDERGROUND LINE
- NEW 13kV OH LINE
- NEW 69kV LINE
- PROPOSED WATER LINE
- NEW DISCHARGE PIPE
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- DISCHARGE PIPING
- RECLAIM WATER PIPELINE
- TAILINGS PIPELINE
- FORMER MINE DEWATERING PIPELINE
- PHASE 1 BUILDING
- PHASE 2 SEEDING AREAS
- CONTACT WATER POND
- NON-CONTACT WATER POND
- PHASE 1 TAILING ROADS
- FINAL GRADING CONTOUR (MAJOR)
- FINAL GRADING CONTOUR (MINOR)
- FINAL GRADING CONTOUR (DEPRESSION)

NOTES:

1. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
2. HYDROGRAPHIC FROM USGS.
3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. NORTH POND 1 CONTACT WATER POND TO PUMP TO WWTP UNTIL YEAR 16. UPON MEETING WATER QUALITY STANDARDS, SPILLWAY IN NORTHEAST CORNER TO BE CONSTRUCTED TO DISCHARGE TO NORTH POND 2 NON-CONTACT WATER POND IN YEARS 16 THROUGH 32 AS SHOWN.
7. NP1 SPILLWAY DIRECTS NON-CONTACT WATER TO NP2 NON-CONTACT WATER POND.

125 0 125 250 375 500 625 750 875 1,000m

SCALE

WHITE PINE COPPER

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RECLAMATION PLAN

WHITE PINE COPPER
ONTONAGON COUNTY, MICHIGAN

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	JOW	JULY 2026
DESIGNED	DJM4	JULY 2026
CHECKED	DJM4	JULY 2026

SHEET TITLE:

PHASE 2 - OPERATION RECLAMATION ACTIVITIES MINE YEAR 17-26

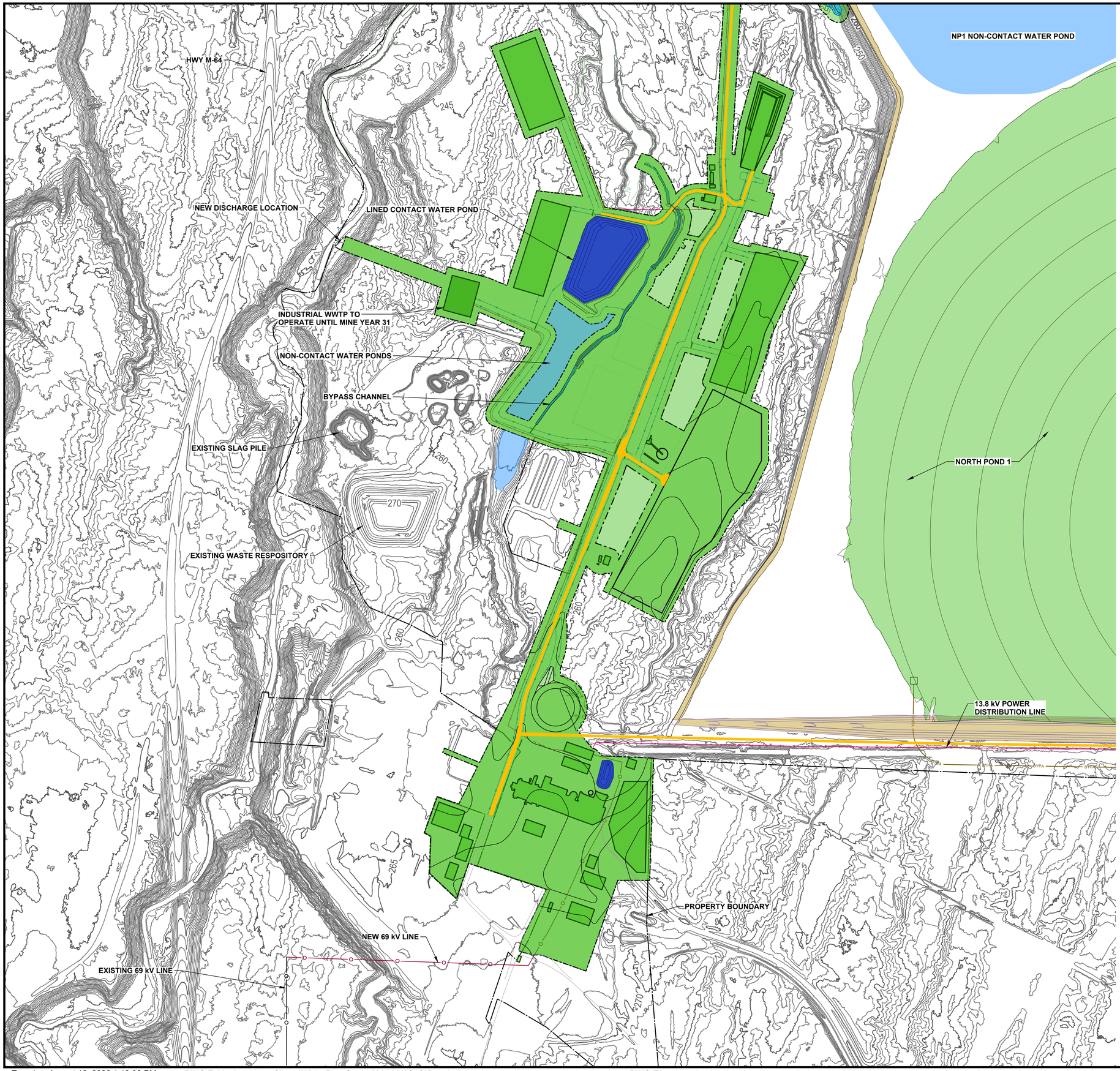
RECLAMATION PLAN

PROJECT NO: 23W200

FIGURE NUMBER

FIGURE 3C

Monday, August 17, 2026 12:24:12 PM DWG Folder Location: Clients\White Pine Copper\23w200\CAD\Drawings DWG Filename: drawing 3c - phase 2 operation reclamation activities.dwg Layout: 3c



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- FORMER MINE DEWATERING PIPELINE
- ROADS TO REMAIN
- TAILINGS CREST WIDENING
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- PROPOSED BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- FINAL GRADING
- PHASE 3 SEEDING AND MAINTENANCE AREAS
- CONTACT WATER POND
- NON-CONTACT WATER POND
- FINAL GRADING CONTOUR (MAJOR)
- FINAL GRADING CONTOUR (MINOR)
- FINAL GRADING CONTOUR (DEPRESSION)

NOTES:

1. BASE AIR PHOTO FROM LATEST BING AERIAL IMAGES.
2. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
3. HYDROGRAPHIC FROM USGS.
4. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
5. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1'.
6. PROCESS PLANT FACILITY AND SURFACE INFRASTRUCTURE TO BE REMOVED IN PHASE 3 EXCEPT INDUSTRIAL WWTP AND ASSOCIATED PIPING AND ANCILLARY UTILITIES.

50 0 50 100 150 200 250 300 350 400m

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ONTONAGON COUNTY, MICHIGAN

REVISIONS NO.	DESCRIPTION	DATE	BY

DATE OF PREPARATION

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SURVEYED		
DRAWN	JRB2	JUNE 2026
DESIGNED	DJM4	JULY 2026
CHECKED	DJM4	JULY 2026

SHEET TITLE:

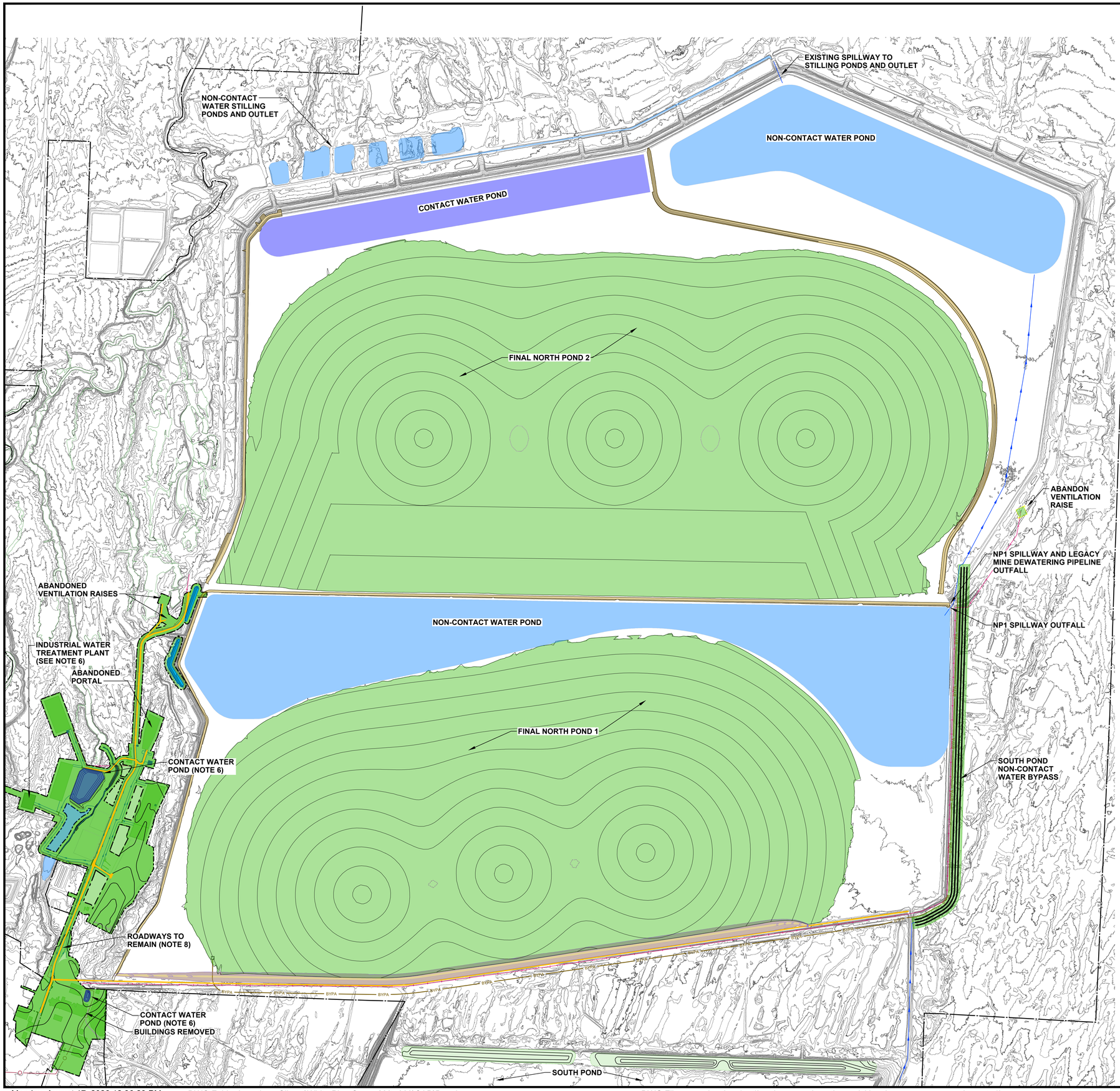
PHASE 3 CLOSURE RECLAMATION ACTIVITIES MILL AREA MINE YEAR 27-31

RECLAMATION PLAN

PROJECT NO: 23W200

FIGURE NUMBER

4A



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING STORM WATER PIPE
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- FORMER MINE DEWATERING PIPELINE (BYPA)
- ROADS TO REMAIN
- TAILINGS CREST WIDENING
- NEW 13.8kV UNDERGROUND LINE
- NEW 13kV OH LINE
- NEW 69kV LINE
- PROPOSED WATER LINE (W)
- NEW DISCHARGE PIPE (SS)
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- PHASE 1 BUILDING
- PHASE 3 SEEDING AND MAINTENANCE AREAS
- CONTACT WATER POND
- NON-CONTACT WATER POND
- FINAL GRADING CONTOUR (MAJOR)
- FINAL GRADING CONTOUR (MINOR)
- FINAL GRADING CONTOUR (DEPRESSION)

NOTES:

1. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
2. HYDROGRAPHIC FROM USGS.
3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. INDUSTRIAL WATER TREATMENT PLANT AND ASSOCIATED PIPING AND INFRASTRUCTURE TO REMAIN WITH CONTACT WATER MANAGEMENT UNTIL MINE YEAR 31.
7. PHASE 3 TO CONSIST OF REMOVAL OF ALL NON-INERT MINE INFRASTRUCTURE, SURFACE INFRASTRUCTURE, AND NON-ESSENTIAL ROADS FOR POST-CLOSURE MONITORING. PORTAL AND VENTILATION RAISES TO BE CAPPED AND BULKHEADS INSTALLED.
8. ROADWAYS TO REMAIN IN PLACE TO SUPPORT CLOSURE ACTIVITIES. REMAINING ROADWAYS AT MINE YEAR 31 TO SUPPORT POSTCLOSURE ACTIVITIES.

125 0 125 250 375 500 625 750 875 1,000m
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DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	JOW	JULY 2026
DESIGNED	DJM4	JULY 2026
CHECKED	DJM4	JULY 2026

SHEET TITLE:

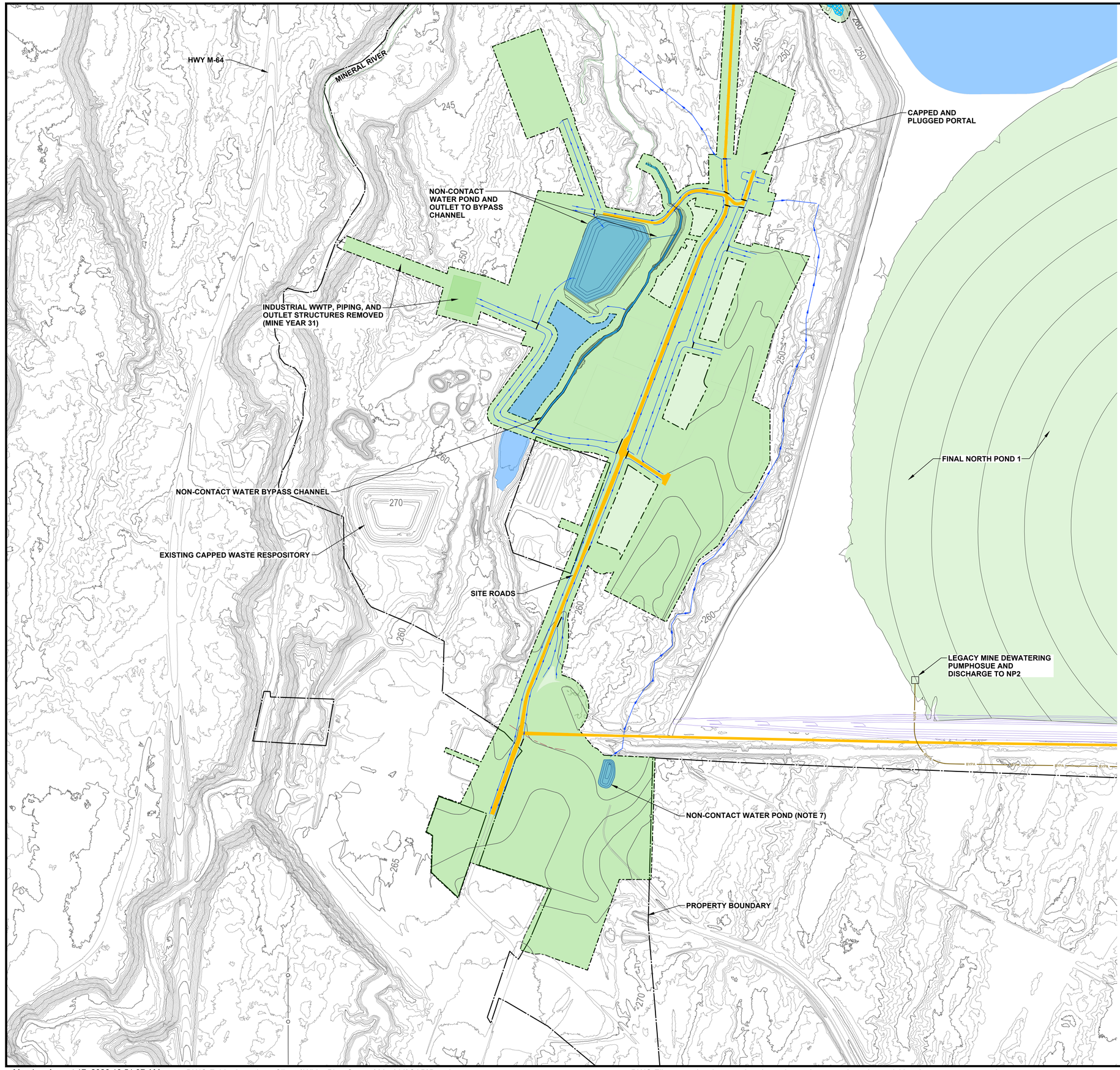
PHASE 3 CLOSURE RECLAMATION ACTIVITIES MINE YEAR 27-31

RECLAMATION PLAN

PROJECT NO: 23W200

FIGURE NUMBER

FIGURE 4B



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING CHANNEL FLOW
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- PHASE 4 SEEDING MAINTENANCE AREAS
- NON-CONTACT WATER POND
- POSTCLOSURE ROADS
- FINAL GRADING CONTOUR (MAJOR)
- FINAL GRADING CONTOUR (MINOR)
- FINAL GRADING CONTOUR
- BYPA — FORMER MINE DEWATERING PIPELINE

NOTES:

1. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
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3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. FINAL GRADING CONTOURS SUBJECT TO CHANGE BASED ON FINAL CONDITIONS.
7. SURFACE WATER POND TO MAINTAIN EXISTING STORM DRAINAGE SYSTEM AND DISCHARGE TO SURFACE WATER.

50 0 50 100 150 200 250 300 350 400m

SCALE

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WHITE PINE COPPER
ONTONAGON COUNTY, MICHIGAN

REVISIONS			
NO.	DESCRIPTION	DATE	BY

DATE OF PREPARATION

	BY	DATE
SURVEYED		
DRAWN	JOW	JULY 2026
DESIGNED	DJM4	JULY 2026
CHECKED	DJM4	JULY 2026

SHEET TITLE:

PHASE 4 - POSTCLOSURE RECLAMATION ACTIVITIES MINE YEAR 32+

RECLAMATION PLAN

PROJECT NO: 23W200

FIGURE NUMBER

FIGURE 5A



LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- APPROXIMATE PROPERTY LINE
- EXISTING ROADWAY
- EXISTING ELECTRIC LINE
- EXISTING WATER
- EXISTING DELINEATED WETLAND
- BYPASS CHANNEL
- CULVERT
- DRAINAGE DITCH
- FORMER MINE DEWATERING PIPELINE
- PHASE 4 SEEDING MAINTENANCE AREAS
- NON-CONTACT WATER POND
- POSTCLOSURE ROADS
- FINAL GRADING CONTOUR (MAJOR)
- FINAL GRADING CONTOUR (MINOR)
- FINAL GRADING CONTOUR (DEPRESSION)

NOTES:

1. HORIZONTAL COORDINATE SYSTEM IS NAD 1983 UTM ZONE, 16N, UNITS IN METERS.
2. HYDROGRAPHIC FROM USGS.
3. ROAD AND BOUNDARY DATA FROM MICHIGAN GIS OPEN DATA AND THE USFS.
4. TOPOGRAPHY AND PLANIMETRIC FEATURES FROM QUANTUM SPATIAL (2014). CONTOUR INTERVAL = 1 METER.
5. ROADWAYS, BUILDING FOOTPRINTS, AND EARTHEN MATERIAL STOCKPILE GRADES AND SLOPES ARE APPROXIMATE.
6. SURFACE WATER POND TO MAINTAIN EXISTING STORM DRAINAGE SYSTEM AND DISCHARGE TO SURFACE WATERS.

125 0 125 250 375 500 625 750 875 1,000m

SCALE

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RECLAMATION PLAN

WHITE PINE COPPER
ONTONAGON COUNTY, MICHIGAN

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DATE OF PREPARATION

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DRAWN	JOW	JULY 2026
DESIGNED	DJM4	JULY 2026
CHECKED	DJM4	JULY 2026

SHEET TITLE:

PHASE 4 - POSTCLOSURE RECLAMATION ACTIVITIES MINE YEAR 32+

RECLAMATION PLAN

PROJECT NO: 23W200

FIGURE NUMBER

FIGURE 5B

Appendix A

Seeding Restoration Practices

A-1 NRCS Conservation Practice Standard CPS-327
A-2 MI Conservation Reserve Program CRP-CP25

A-1

NRCS Conservation Practice Standard CPS-327

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

CONSERVATION COVER

CODE 327

(ac)

DEFINITION

Establishing and maintaining permanent vegetative cover.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Reduce sheet, rill, and wind erosion.
- Reduce sediment transport to surface water.
- Reduce ground and surface water quality degradation by nutrients.
- Reduce emissions of particulate matter.
- Provide wildlife, pollinator, and other beneficial organism habitat.
- Improve soil health by maintaining or increasing soil organic matter quantity.
- Improve soil health by increasing soil aggregate stability.
- Improve soil health by enhancing habitat for soil organisms.
- Improve soil health by reducing compaction.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on most lands needing permanent vegetative cover. This practice may be used to conserve and stabilize archeological and historic sites. This practice does not apply to plantings for forage production or to critical area plantings that require special measures to ensure successful establishment. If the soil and water resource concerns meet minimum planning criteria and the only purpose of the planting is to provide wildlife habitat, Wildlife Habitat Planting (CPS 420) may be implemented.

CRITERIA

General Criteria Applicable to All Purposes

Select species that are adapted to the soil, ecological sites, and climatic conditions and are suitable for the planned purpose and site conditions.

Ensure that planting dates, seeding rates, planting methods, and care in handling and planting seed or planting stock are used to accomplish the planned purpose.

If the specific Rhizobium bacteria for selected legumes are not present in the soil, treat the seed with the appropriate available inoculum. Inoculate legumes at time of planting based on conservation objectives and site history. See USDA NRCS Plant Materials Technical Note No. 5 (Title 190), Using the Appropriate Legume Inoculant for Conservation Plantings.

Prepare the site by eliminating weeds that will impede the establishment and growth of selected species.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at https://www.nrcs.usda.gov/ and type FOTG in the search field.

USDA is an equal opportunity provider, employer, and lender.

Apply nutrients and amendments as needed to ensure vegetation establishment and planned growth. Nutrients and amendments are not always needed for native plant establishment.

The established stand will produce a positive soil conditioning index (SCI) value. Use the SCI results available in the current NRCS erosion prediction technology.

For organic and transitioning-to-organic operations, all seeds, planting stock, materials, and methods used in the implementation of this practice standard must comply with the National Organic Program (NOP) Rules. See the USDA Organic Regulations and the NRCS resource page Conservation for Organic Farmers.

Additional Criteria to Reduce Sheet, Rill and Wind Erosion

Determine and maintain the amount of plant biomass and cover needed to reduce wind and water erosion to the planned soil loss objective by using the current NRCS erosion prediction technology. Soil erosion must not exceed the tolerable soil loss value for the critical dominant soil in the planning area.

Additional Criteria to Reduce Emissions of Particulate Matter

Establish plants that can tolerate the impacts of routine operations (e.g., orchard and vineyard alleys during mowing, spraying, or harvest operations) and provide sufficient ground cover in the planted area to minimize the generation of particulate matter.

Additional Criteria to Provide Wildlife, Pollinator, and Beneficial Organism Habitat

Plant a diverse mixture of tree, shrub, grass, and forb species to meet the habitat needs of the targeted species using approved habitat evaluation tools for the respective state.

Reduce pesticide exposures that could harm wildlife, pollinators, and other beneficial organisms.

Additional Criteria to Improve Soil Health

To maintain or improve soil organic matter, select plants that produce high volumes of organic material. Determine the amount of biomass needed by using the current soil conditioning index procedure.

CONSIDERATIONS

General Considerations

Use certified seed and planting stock that is adapted to the site when it is available.

When restoring or repairing sites, consider use of inoculant for native species when available.

When using Conservation Cover as a prairie strip, design a minimum width of 30 feet.

Mowing may be needed during the establishment period to reduce competition from weeds.

To mitigate for greenhouse gas emissions, select species that will store carbon in the soil via extensive root systems or in woody biomass.

Location of this practice in orchard/vineyard alleys can significantly reduce the particulate matter emissions associated with tractor traffic in the alleys when compared to bare alleys.

If nitrogen fertilizer is used on sites where nitrogen-responsive weeds are present, delay N application until the planted species are well established to avoid expected weed problems. If the site has poor or low-fertility soil, consider using slow-release nutrient sources in lieu of soluble fertilizer to improve the site without stimulating weeds.

To maximize spatial and temporal diversity, rotate management and maintenance activities (e.g., mow only one-fourth or one-third of the area each year) throughout the managed area.

Where wildlife management is an objective, encourage plant species and structural diversity to maximize wildlife use. Habitat evaluation tools can aid in selecting plants for food and cover.

As long as soil loss is within tolerable soil loss limits, use less dense seeding rates where ground-nesting pollinator and wildlife habitat are the primary purposes.

To provide habitat for natural enemies of crop pests, select a mix of plant species that provide year-round habitat or food (accessible pollen or nectar) for the desired beneficial species. Use a diverse mix of plant species that come into bloom at different times and provide a sequence of bloom throughout the year (e.g., plant at least three flowering species from each of the three bloom periods—spring, summer, and fall). Use habitat requirements of predatory and parasitic insects, spiders, insectivorous birds and bats, raptors, and predators of terrestrial rodents. Consult land grant university integrated pest management recommendations for beneficial habitat plantings to manage the target pest species. See USDA NRCS Agronomy Technical Note No. 9 (Title 190), Preventing or Mitigating Potential Negative Impacts of Pesticides on Pollinators using IPM and Other Conservation Practices.

Use native species that are appropriate for the identified resource concern and management objectives with the aim of reestablishing the native plant community for the site. It should be considered adequate if a native cover other than what was planted establishes and addresses the resource concern and landowner objectives .

During vegetation establishment, natural mulches, such as wood products or hay, can be used to conserve soil moisture, support beneficial soil life, and suppress competing vegetation.

Including a diverse mix of species enhances the above- and below ground ecosystem biodiversity.

Additional Considerations to Improve Soil Health

The effects of this practice are enhanced when it is integrated into a soil health management system. Refer to NRCS Soil Health Technical Note No. 4 (Title 450), “The Basics of Addressing Resource Concerns with Conservation Practices within Soil Health Management Systems on Cropland” for more information.

PLANS AND SPECIFICATIONS

Develop plans and specifications for each field or treatment unit according to the criteria and operation and maintenance requirements of this standard. Specifications must describe the requirements to apply this practice to achieve the intended purpose. Record the following specification components in an approved NRCS Conservation Practice Standard Conservation Cover (Code 327) implementation requirements document:

- All applicable purposes for the installation of this practice.
- Field numbers and installation locations referenced on the conservation plan map.
- Recommended plant species.
- Seeding rates and dates.
- Seedbed preparation procedures.
- Establishment methods.
- Management actions needed to ensure an adequate establishment.
- Soil loss estimates and SCI results, if applicable.

When applying this practice to perennial systems, such as orchards and vineyards, the establishment and management requirements apply only to the areas planted with this practice (e.g., the grassed alleyways are seeded and managed under this practice, but the vine row or tree row is managed separately).

OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan for this practice. Planned activities may include, but are not limited to, the following:

- Protect the cover from irreversible damage by traffic, implements, and herbicides.
- Periodic removal of some products (such as high value trees, medicinal herbs, nuts. and fruits) is permitted provided the conservation purpose is not compromised by the loss of vegetation or harvesting disturbance.
- Mowing and harvest operations in a perennial crop system (such as orchards, vineyards, berries, and nursery stock), will be accomplished in a manner that minimizes the generation of particulate matter.
- Mowing may be needed during the establishment period to reduce competition from weeds.
- Control noxious weeds and invasive species.
- If wildlife habitat enhancement is a purpose, maintenance practices and activities will occur during periods of the day or season to minimize negative impacts of disturbance.
- If wildlife habitat is a purpose, include the procedures necessary to conserve the cover's wildlife habitat functions.
- To support insects eaten by grassland nesting birds, spot treat noxious weeds to protect other forbs and legumes that benefit native pollinators and other wildlife.
- Revegetate bare spots when they occur.

REFERENCES

USDA AMS. Organic Regulations. Washington, D.C. Accessed July 22, 2022. https://www.ams.usda.gov/rules-regulations/organic

USDA ARS. 1997. Agricultural Handbook Number 703. Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE). Washington, D.C. Accessed July 22, 2022. https://www.ars.usda.gov/ARSUserFiles/64080530/RUSLE/AH_703.pdf

USDA NRCS. Conservation for Organic Farmers. Accessed July 22, 2022. https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/organic/

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USDA NRCS. 2014. Agronomy Technical Note No. 9 (Title 190), Preventing or Mitigating Potential Negative Impacts of Pesticides on Pollinators using IPM and Other Conservation Practices. Washington, D.C. Accessed July 22, 2022. 595_KY_GD_Agronomy_Tech_Note_9_Preventing_or_Mitigating_Potential_Negative_Impacts_of_Pesticides_on_Pollinators_2014 (usda.gov)

USDA NRCS. 2019. Soil Health Technical Note No. 4 (Title 450). The Basics of Addressing Resource Concerns with Conservation Practices within Soil Health Management Systems on Cropland. Washington, D.C.

USDA NRCS. 2020. Plant Materials Technical Note No. 5 (Title 190), Using the Appropriate Legume Inoculant for Conservation Plantings. USDA, NRCS, Plant Materials Program. Washington, D.C. Accessed February 28, 2024. National Plant Materials Technical Note 5: Using the Appropriate Legume Inoculant for Conservation Plantings (usda.gov)

A-2

MI Conservation Reserve Program CRP-CP25

Rare and Declining Habitat (PRAIRIE)

Michigan CONSERVATION RESERVE PROGRAM

Natural Resources Conservation Service (NRCS) October 2006



Photo courtesy of USDA NRCS

WHAT IS A RARE AND DECLINING HABITAT (PRAIRIE)?

The Rare and Declining Habitat (PRAIRIE) practice is a native grass and wildflower planting that provides soil erosion protection as well as habitat for a variety of wildlife, especially upland game birds and songbirds.

Prairies were found throughout Michigan prior to European settlement. Michigan prairies were diverse areas of native grasses and wildflowers. Grasses and wildflowers common to prairies evolved to be fire tolerant, and relied on periodic fires to maintain this plant diversity. Today, Michigan has lost over 99% of its original prairies.

Native grasses found in prairies were present in Michigan when Europeans arrived. Some of the more common native grasses that grow well in Michigan include warm-season grasses such as Big Bluestem, Little Bluestem, Indian grass, and Switchgrass as well as native cool season grasses like Canada and Virginia Wild Rye. Common wildflowers include Black-Eyed Susan, Purple Coneflower, Coreopsis, and others.

Prairie plantings of warm-season species provide excellent nesting and winter cover for wildlife. These tall, stiff, upright grasses stand up well to snow and ice. These grasses put most of their growth on in the heat of the summer, unlike the cool-season grasses (found in most lawns) which grow best in the spring and fall.

Native grasses will live a long time after establishment. However, like most long-lived plant species, they generally establish slowly. Therefore, it is very important to establish these grasses properly and to have patience when evaluating the results.

ELIGIBILITY

To be eligible for this practice with the Conservation Reserve Program, the land must have a cropping history (4 out of 6 years from 1996-2001). Further, the site must be within 0.5 miles of a Prairie as identified on the Pre-Settlement Vegetation Maps found in Section I of the Field Office Technical Guide.

CRP POLICY

For General CRP, **at least 5 NATIVE grasses plus at least 10 NATIVE wildflowers** will be planted. Any other plantings are not eligible. **Only NATIVE grasses and wildflowers may be planted for this practice** (see MI NRCS Biology Technical Note #13 for a list of native vs. non-native plants in Michigan).

Prairie plantings will be established according to the Restoration and Management of Rare and Declining Habitat (643) standard in the local Field Office Technical Guide (FOTG), and they must be planted within 12 months of contract approval to remain in compliance. If circumstances beyond the landowner's control prohibit the planting within the first 12 months, the local FSA County Committee may approve an extension to the next planting season.

PLANTING

It is very important to plant native grasses into a weed-free, firm seedbed. If the field is currently in cropland, weed control efforts should begin prior to planting. Use herbicide or tillage to eliminate competing vegetation. If necessary for erosion control, seed a temporary cover. Eliminate the temporary vegetation at planting time with tillage or herbicides.

If the field is currently in sod, begin weed control efforts using broad-spectrum herbicides in the fall. Apply herbicides again after the spring green-up prior to planting (if possible, a prescribed burn prior to spring green up to remove the dead litter from the fall treatment will provide best results).

Broad-spectrum herbicides will provide good initial weed and sod control for fall and spring applications. Other herbicides labeled for warm season grass establishment may be used alone or mixed with broad-spectrum herbicides to provide residual weed control, which may result in faster establishment of the native grasses. Contact your local Michigan State University Extension Agent for specific herbicide

recommendations. **Apply all herbicides according to the label**.

Plant during the period specified in the attached plan/design sheet. Apply lime and fertilizer according to needs determined by a soil test and MSU recommendations.

Use a specialized no-till drill that is able to handle native grass seeds (possibly available at some local Conservation District offices, DNR offices, Pheasants Forever chapters, etc). Plant the seeds **no deeper than** 1/8 inch.

If a native grass drill is not available, the seed may be broadcast or aerial seeded. In either case, the seedbed must be worked up and firmed with a cultipacker or similar equipment. A carrier such as potash may also be needed in order to spread the seed evenly. **After seeding, the site must be rolled or cultipacked to ensure proper seed to soil contact.** Plant the seeds **no deeper than** 1/8 inch.

Since warm-season grasses are slow starters, it is important to control unwanted vegetation, especially the first year after planting. Use mowing or herbicides as needed until a Final Status Review is issued to control unwanted vegetation. Mow when competing weeds are taller than the planted grasses and wildflowers, and at a height above the planted grasses and wildflowers. Some herbicides labeled for warm season grass establishment will provide residual weed control without damaging the planted grasses. For additional information on herbicide controls, see Conservation Management Sheet "Establishing Prairie Grass Buffer Strips" and contact your local Michigan State University Extension Agent for specific herbicide recommendations. **Always apply herbicides according to labeled directions.**

OPERATION AND MAINTENANCE

Noxious weeds and other undesirable plants, insects, and pests shall be controlled, including such maintenance as necessary to avoid detrimental effects to the surrounding land.

After the Final Status Review, maintain the planting according to your CRP conservation plan. Maintenance activities are allowed only on a spot basis and only if necessary to maintain stand health, maintain stand diversity, or control pests that will damage the CRP cover or adjacent lands. **MOWING** is only authorized between Aug 1st and Aug 20th to protect ground-nesting wildlife and to allow re-growth for winter cover. Other maintenance activities or Mid-Contract Management will only be allowed outside the designated dates to protect ground-nesting wildlife. Designated dates are from May 1st to August 1st. If management or maintenance activities are needed within these dates, the FSA County Committee **must** approve the management activity **prior to** the activity occurring.

Mowing for generic weed control or for cosmetic purposes is prohibited.

REQUIRED MANAGEMENT

All new CRP contracts must have mid-term contract management activities scheduled that are site specific and will ensure plant diversity, wildlife habitat, and protection of soil and water resources. Management activities that will ensure these benefits in prairie plantings include prescribed burning (according to an approved burn plan), disking, interseeding of wildflowers, etc. All management activities must be performed according to NRCS Standards and Specifications as found in the FOTG, and CRP policy. See the attached design sheet for suggested management activities on your property.

OTHER MANAGEMENT CONSIDERATIONS

For optimum wildlife habitat, plant a diversity of grasses and wildflowers. This mixture will provide winter and nesting cover, flowers for pollinating insects, as well as a good seed and insect source for food.

To facilitate future prescribed burning, consider establishing the perimeter of the field to a CP1 (Introduced Grasses and Legumes) mixture such as timothy, orchard grass, and clovers, CP12 (Food Plots) on non-erosive sites (cost-share is not authorized for food plots), or Native cool season grass.

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Rare and Declining Habitat (PRAIRIE) DESIGN WORKSHEET CRP CP25

Landowner: **County:**

Farm: Tract: Field(s): Acres: Date:

RECOMMENDED SPECIES and SEEDING RATE (PLS #/acre = Pure Live Seed Pounds per Acre)

SPECIES	RATE		TOTAL needed = (RATE X Acres)	
		PLS #/acre	0.0	PLS #
		PLS #/acre	0.0	PLS #
		PLS #/acre	0.0	PLS #
		PLS #/acre	0.0	PLS #
		PLS #/acre	0.0	PLS #
Wildflowers:	1.0	PLS #/acre	0.0	PLS #

Recommended Wildflowers include:

BEFORE PLANTING in Year:

☐ Herbicide$_1$ **(per label)**: Dates =

☐ Herbicide$_2$ **(per label)**: Dates =

☐ Tillage: Dates =

☐ Temporary Seeding:

☐ **Apply fertilizer and lime according to an approved soil test and MSU recommendations for "establishing native grasses".**

☐ Other:

PLANTING METHOD in Year:

☐ **Planting Method:**

Dates =

(If unforeseen circumstances prohibit the planting of the grass by this date, please contact our office as soon as possible)

GRASS AND WILDFLOWER POST-PLANTING MAINTENANCE for Pest Control

☐ **Mowing: <u>BEFORE</u> FINAL STATUS REVIEW = mow 12" high when the weeds are 12" taller than the planted grasses**

<u>AFTER</u> FINAL STATUS REVIEW* = 12" MINIMUM Mowing Height*

☐ Herbicide* **(per label)**: ☐ Prescribed Burning*: According to an approved plan

☐ Other:*

****NOTE: after the Final Status Review has been issued, other maintenance activities will be conducted outside the primary nesting season (May 1st – August 1st), and weeds will be treated on a "spot" basis only, unless prior approval is granted by the County Committee.**

LOCATION AND LAYOUT SKETCH & ADDITIONAL INFORMATION

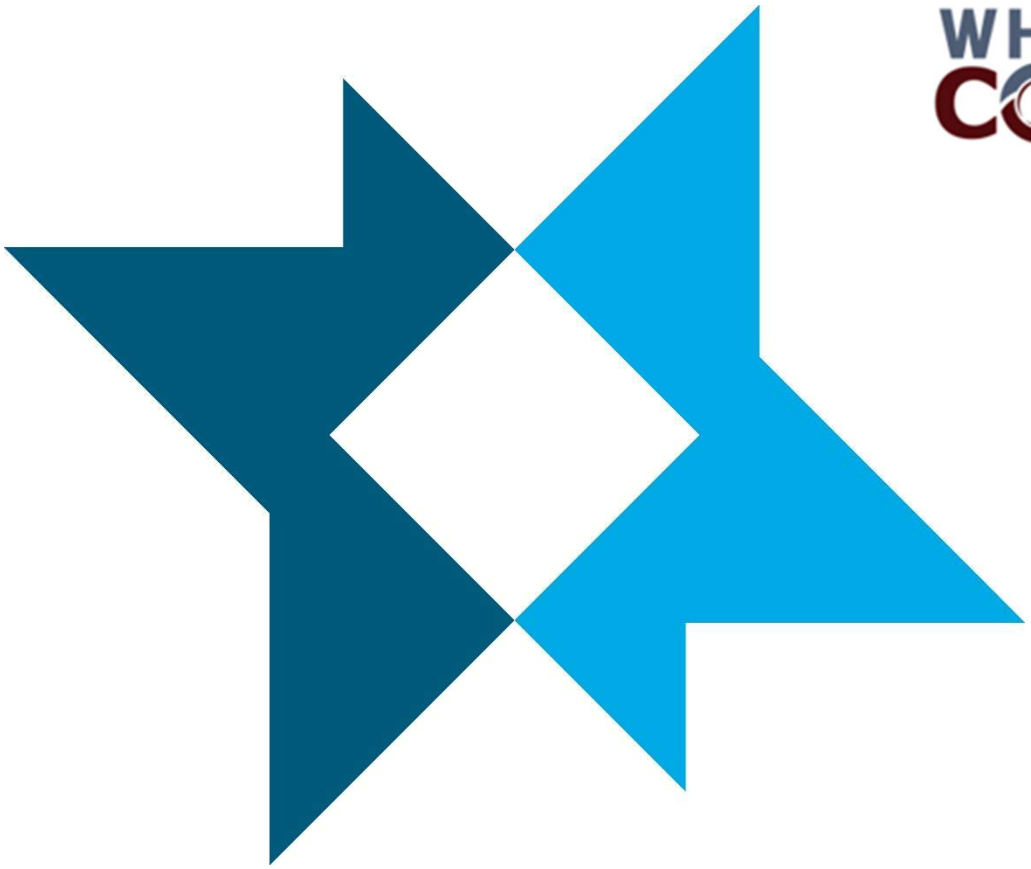
ADDITIONAL INFORMATION:

Appendix H

Contingency Plan

Contingency Plan

White Pine North Project



White Pine Copper LLC
White Pine, Michigan

June 2026

Project ID: 25W006

Solving our clients' toughest science and engineering challenges.

Contingency Plan
White Pine North Project

Project ID: 25W006

Prepared for
White Pine Copper LLC
White Pine, Michigan

Prepared by
Foth Infrastructure & Environment, LLC

June 2026

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Contingency Plan
White Pine North Project

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List of Abbreviations, Acronyms, and Symbols

AQD	Air Quality Division
EGLE	Michigan Department of Environment, Great Lakes, and Energy
Foth	Foth Infrastructure & Environment, LLC
H&S	Health & Safety
IC	Incident Commander
MAP	Malfunction Abatement Plan
MIOSHA	Michigan Occupational Safety and Health Administration
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
PEAS	Pollution Emergency Alerting System
PIO	Public Information Officer
PIPP	Pollution Incident Prevention Plan
Plan	Contingency Plan
Project	White Pine North Project
PTI	Permit to Install
QA/QC	quality assurance/quality control
SCADA	Supervisory Control and Data Acquisition
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
TARP	trigger action response plan
USGS	United States Geological Survey
WPC	White Pine Copper LLC

1. Introduction

This Contingency Plan has been prepared for White Pine Copper's (WPC) White Pine North Project (Project). In accordance with Michigan's Nonferrous Metallic Mining Regulations – Part 632 Section 324, a Mining Permit Application (Foth, 2026a) shall contain a Contingency Plan (Plan). This Plan establishes procedures to prevent, respond to, and mitigate environmental, public health, and safety risks associated with accidental releases, system failures, or natural hazards related to the construction, operation, closure, and post-closure care of the proposed underground nonferrous copper mining facility. This Plan applies to all mine facilities, including underground workings, surface infrastructure, stockpiles, wastewater systems, tailings or settling areas, and transportation corridors. A generalized overview of project location and site layout can be reviewed on Figure 1-1 and Figure 1-2.

2. Risk Assessment and Response Measures

This Plan describes risks associated with mining operations and the response measures that could be implemented should a failure occur. In addition, a description of the design features which mitigate potential risks are also noted. Detailed baseline conditions and risk characterization are provided in the Environmental Impact Assessment (Foth, 2026b).

2.1 Toxic and/or Acid-Forming Materials (425.205(1)(a)(i))

A release or threatened release of toxic or acid-forming materials may occur if sulfide-bearing tailings, waste rock, ore, concentrate, or impacted mine water is exposed to oxygen and water under conditions that generate acidity and mobilize metals, or if engineered controls intended to contain contact water and solids fail, however, based on Project leachate testing and material characterization, the acid-generating potential is low. The primary objectives of response are to prevent escalation, maintain containment, protect workers and the public, minimize impacts to waters of the state and groundwater, and restore engineered controls while meeting all notification and documentation requirements.

2.1.1 Tailings Management Facility, Mine Rock Placement, and Ore Storage Areas

Tailings management facilities and ore storage areas are engineered and operationally controlled units where sulfide-bearing or metal-bearing materials may be deposited, temporarily stored, or managed prior to processing, disposal, or reclamation. There is no separate waste rock storage facility for the Project. Any waste rock brought to the surface will be managed as planned construction material and may be beneficially reused as engineered fill for Project earthworks, including bolstering interior dam features of the existing tailings facility. The crushed ore stockpile will be enclosed under a geodesic dome to protect the stockpile from precipitation and reduce wind-driven dispersion of fine material; drainage from stockpile areas will be managed as contact water where it may interact with mine materials. These areas are designed to isolate reactive materials from the environment through a combination of facility siting, grading and drainage controls, containment systems, seepage collection, operational water management, and monitoring.

2.1.1.1 Assessment of Risks

Releases or threats of release in these areas may be triggered by overtopping during extreme precipitation or rapid snowmelt, erosion of slopes and drainage features, structural instability or settlement, internal erosion or piping, failure of seepage collection systems, liner or underdrain compromise (where present), damage from equipment operations, or inadequate diversion of noncontact water that increases hydraulic loading. Because the acid-forming potential of ore and tailings is considered low, loss of containment is expected to present risk primarily through suspended solids/turbidity, mine-affected water migration, and potential mobilization of metals under contact-water conditions, rather than persistent acid drainage. Nevertheless, any uncontrolled release of tailings, ore, or mine rock to surface drainage pathways may adversely impact surface waters and must be treated as a reportable environmental incident until assessed and stabilized.

2.1.1.2 Mitigation of Risks

Risk mitigation is achieved through conservative facility design criteria, operations that maintain required freeboard and stability factors, robust diversion of clean runoff away from reactive materials, engineered seepage collection and conveyance to lined contact water systems, and routine inspections supported by instrumentation and performance monitoring. Operational controls include maintaining graded surfaces to promote controlled drainage, promptly repairing erosion features, controlling traffic and placement practices to protect liners and drains, and implementing trigger action response plans (TARPs) that define threshold conditions requiring increased monitoring, operational restrictions, and engineered interventions. Where acid generation is plausible, mitigation also includes segregation and management of contact water to treatment or reuse rather than discharge.

Prior to mine operations, WPC will develop and implement spill procedures and planning documents designed to prevent releases and to provide rapid, effective containment and response should a release occur. These documents will include a Pollution Incident Prevention Plan (PIPP) and a Spill Prevention, Control, and Countermeasure Plan (SPCC Plan). Together, these plans will define spill prevention practices, inspection and maintenance requirements, secondary containment and control measures, personnel training, and response procedures applicable to site activities that could result in a release to soil, groundwater, or surface water.

While the PIPP and SPCC Plan address hazardous materials and petroleum products used on site, the measures described in this section focus specifically on the prevention and containment of potential impacts associated with potentially reactive ore, waste rock, and tailings, including management of contact water that may become influenced by these materials. Spill prevention and response procedures for other hazardous materials (e.g., reagents and process chemicals) are addressed in Section 2.7.

Facilities that currently exist or are planned as part of the Project and that may store potentially reactive materials and/or manage contact water generated by mining operations include the following:

- North Pond 1
- North Pond 2
- Temporary Ore Stockpile
- Crushed Ore Stockpile
- Contact Stormwater Ponds
- Existing slag pile
- Existing waste repository
- Mining Laydown Areas

2.1.1.3 Risk Response Measures

When a release or credible threat is identified, the Operator will immediately implement source control, containment, recovery (as feasible), and stabilization actions consistent with safe work practices and direction from the engineer of record or qualified geotechnical personnel. Source control typically involves stopping deposition or material movement in the affected area, restricting equipment access, reducing inflows that contribute to hydraulic loading, and rerouting clean water away from the facility. Containment focuses on keeping impacted water

and solids within engineered pathways by directing flows to lined ditches, sumps, or ponds and installing temporary berms or barriers to prevent off-site migration. Recovery and corrective actions include removal of released solids from drainage pathways where safe and practicable, restoration of grades and drainage, repair of collection systems, and implementation of engineered stabilization measures. Environmental staff will initiate field screening (e.g., pH and conductivity) and confirmatory sampling in accordance with the monitoring plan to bound the extent of impact and support corrective action decisions and required notifications will be made as described in Section 3.

2.1.2 Concentrate Handling, Loadout, and Off-Site Transport

Copper concentrate produced by the process plant will be dewatered to a transportable powder-like material (target moisture approximately 12.5% wet basis), stockpiled in a designated enclosed loadout area, and loaded for off-site shipment by truck. Although the acid-generating potential of Project materials is considered low, concentrate is metal-bearing and a release could create localized soil or surface-water impacts through direct deposition of solids, contact water contamination, or windblown particulate if mishandled; accordingly, concentrate releases will be treated as reportable environmental incidents until assessed and stabilized.

2.1.2.1 Assessment of Risks

Credible release scenarios include spills during concentrate transfer or truck loading (e.g., hose/fitting failure, loader bucket spillage, overfilling, dropped loads); loss of containment from stockpiled concentrate due to wind or precipitation exposure; and transportation incidents such as traffic accidents, rollover, tailgate failure, or loss of cover resulting in concentrate release along haul routes. Secondary risks include track-out from the loadout area leading to off-site deposition of fine solids, and stormwater contact with spilled concentrate that could transport suspended solids and dissolved metals to ditches, culverts, or surface waters. Because concentrate is shipped off-site, an incident may occur beyond the facility boundary and require coordination with local emergency responders and roadway authorities.

2.1.2.2 Mitigation of Risks

Risk mitigation includes storage of concentrate in enclosed facilities, using designated enclosed loading areas with controlled drainage, maintaining good housekeeping to prevent accumulation of fines, and loading concentrate into covered trucks to minimize wind loss during transport. Operational controls include using standard loading procedures (e.g., controlled drop height, avoiding overfilling), inspecting trucks and covers prior to departure, securing tailgates and tarps, and implementing track-out controls at egress points as needed. Egress controls, including the wheel wash station where appropriate, will be used to reduce track-out from loading and haul routes and minimize off-site transport of mine-affected solids.

2.1.2.3 Risk Response Measures

If a concentrate spill or credible threat is identified, the Operator will immediately stop the activity, secure the area, and implement containment and recovery actions consistent with safe work practices. Initial response will prioritize preventing migration to storm drains, ditches, or surface waters by deploying temporary berms/booms, placing covers/tarps over spilled material as appropriate, and isolating affected drainage pathways. Spilled concentrate will be recovered promptly using dry methods where feasible (sweeping/vacuuming or mechanical

recovery) and returned to the concentrate management system or containerized for appropriate management. If precipitation is occurring or contact water has been generated, impacted water will be managed as contact water pending characterization and/or treatment consistent with the site water management system. For off-site transportation incidents, the Operator (or shipper) will coordinate with emergency responders and roadway authorities to secure the scene, prevent runoff to sensitive receptors, and recover released material; notifications and incident documentation will be completed as described in Section 3.

2.1.3 Contact Water Ponds, Sumps, and Collection/Conveyance Systems

Contact water ponds and associated collection and conveyance systems (including lined ditches, culverts, pipelines, sumps, pumps, and equalization capacity) are intended to capture and manage water that has interacted with ore, waste rock, tailings, disturbed ground, or process areas. These systems provide storage, routing, and operational buffering so contact water can be reused or treated prior to discharge under permit conditions.

2.1.3.1 Assessment of Risks

The principal risk scenario is uncontrolled release of impacted water due to overtopping, inadequate storage capacity, pump or power failure, frozen or obstructed conveyance, structural or liner damage, valve malfunction, pipeline rupture, or unanticipated inflows from storm events, snowmelt, or facility upsets. Because contact water may exhibit depressed pH and/or elevated dissolved metals and suspended solids, any bypass of treatment or uncontrolled migration to surface waters or infiltration pathways can create water quality impacts and potential exceedances of applicable standards. High-risk conditions include rapidly rising water levels that reduce freeboard, visible erosion at embankments or spillways, abnormal seepage around pond perimeters, and operational alarms indicating pump or transfer failures.

2.1.3.2 Mitigation of Risks

Risk mitigation relies on maintaining sufficient storage and freeboard, redundant pumping and transfer capacity, routine sediment management to preserve storage volume, winterization measures to prevent freezing or blockage, and preventive maintenance of conveyance and control equipment. Mitigation also includes diversion of noncontact water away from contact systems to reduce unnecessary loading, automated level monitoring with alarm thresholds, and established operating limits that trigger early transfers to treatment or alternate storage. The overall goal is to ensure that contact water remains within lined, controllable systems under both typical operations and design storm conditions. Track-out of mine-affected solids from contact areas will be minimized using the wheel wash station for vehicles exiting the site; wheel wash water and captured sediments will be managed as contact water and routed to the site's contact water collection and treatment/reuse system.

2.1.3.3 Risk Response Measures

If overtopping is imminent or a release is suspected, the Operator will prioritize immediate hydraulic control to prevent additional discharge and restore system integrity. This response typically begins by reducing inflows (including rerouting clean runoff and pausing contributing operational activities), maximizing available storage, and transferring water to treatment, reuse, or emergency storage using backup pumps and contained conveyance. If a pipeline or valve failure is implicated, the affected segment will be isolated and repaired, and any interim bypass

will be fully contained within engineered systems to avoid unauthorized discharge. If impacted water has migrated beyond containment, downstream containment and recovery actions will be implemented as practical (e.g., berming and vacuum recovery), followed by field screening and confirmatory sampling to define extent and guide cleanup. Notifications and incident documentation will proceed per Section 3, and the system will not return to normal operation until freeboard and functional containment are re-established and verified.

2.1.4 Underground Mine Workings and Mine Water Management Systems

Mine water will be generated in the underground workings as a result of natural inflow and operational water use. Consistent with standard underground mine design and safety requirements, the Project will be continuously dewatered during operations, with mine water routed through dedicated collection infrastructure to the tailings facility in which active discharge is occurring with eventual reuse and/or treatment as part of the site water management system. The focus of this subsection is limited to evaluating whether underground mine water presents a credible release or threat of release of toxic or acid-forming materials; the separate hazard of large-scale mine flooding and associated operational disruptions is addressed under Section 2.9 (Natural Risks), and water management system reliability is addressed under Section 2.5 (Wastewater Treatment System).

2.1.4.1 Assessment of Risks

During active mining, the potential for an environmental release of toxic or acid-forming materials originating underground is expected to be low because water is routinely collected and controlled as part of required dewatering. Water level increases following loss of pumping capacity are expected to be gradual relative to the timeframes needed to create uncontrolled surface releases, based on the Project's dewatering and planned closure reflooding assumptions. In addition, any mine water that could contain elevated dissolved constituents would be routed through the controlled mine water collection network to the tailings facilities for reuse/treatment rather than being discharged directly to the environment. Credible residual risk scenarios during operations are therefore generally limited to localized operational failures that could temporarily affect control of mine water within the mine water management system (e.g., loss of pumping at a sump, disruption of conveyance within a shaft/raise, or localized containment failure at transfer points). These scenarios are most likely to manifest as operational indicators (e.g., rising sump levels, pump alarms, flow anomalies) and, if a conveyance failure occurs near the surface, as visible flow at known infrastructure locations rather than as a concealed off-site release.

2.1.4.2 Mitigation of Risks

Risk mitigation is achieved through routine mine design and operational controls that inherently manage mine water, including defined collection points (sumps), redundant or standby pumping capacity, controlled conveyance to the surface water management system, and operational monitoring that provides early detection of abnormal flows or water levels. Because mine water must be managed for worker safety and geotechnical stability, the Project's baseline operating condition is continuous capture and routing of mine water within engineered systems, which reduces the likelihood that mine water could bypass collection and become an uncontrolled environmental release. Where feasible, additional mitigation includes maintenance practices that preserve sump capacity and conveyance integrity, and operational controls that ensure

mine water is directed to designated management units (reuse/treatment/emergency storage) under normal and upset conditions.

2.1.4.3 Risk Response Measures

If monitoring, alarms, inspection, or observation indicates a credible threat of uncontrolled mine water movement or a release at or near a conveyance/transfer point, the Operator will implement immediate actions focused on maintaining capture and routing within the engineered systems and preventing any discharge to the environment. Response actions will prioritize personnel safety, rapid restoration of pumping and conveyance control, and containment at any observed surface manifestation. Notification and documentation requirements will be implemented consistently with Section 3, and any water quality verification sampling needed will be conducted at appropriate control points within the mine water and surface water management systems. Detailed operational response procedures for pump failures, conveyance interruptions, treatment upsets, and emergency storage utilization are addressed in Section 2.5, while broader flooding hazards driven by natural events or long-duration interruptions are addressed in Section 2.9.

2.2 Storage, Transportation, and Use of Explosives (425.205(1)(a)(ii))

This section addresses potential accidents or failures associated with explosives and blasting agents and identifies response measures to protect public health and safety and the environment. Explosive materials associated with the Project will be procured, stored, distributed, transported, and used under applicable federal explosives law (18 USC 841–848) and implementing regulations (27 CFR Part 555), consistent with Michigan law requiring such compliance for importing, manufacturing, distributing, or storing explosive materials in the state. Requirements for safe handling and use will also incorporate applicable Mine Safety and Health Administration (MSHA) standards for metal and nonmetal mining operations, including MSHA requirements for explosives and blasting practices.

2.2.1 Storage and Handling Explosives

2.2.1.1 Assessment of Risks

Explosive-related risks during storage, transport, and routine use primarily involve accidental detonation, fire or heat exposure affecting explosive materials, incompatibility or loss of required separation between detonators and bulk explosives/blasting agents, deterioration or instability from improper storage conditions, vehicle incidents during transport, and unauthorized access or theft. The primary consequences are severe injury or fatality, potential blast effects (overpressure and fragmentation), and secondary impacts to mine infrastructure and emergency response access. Environmental impacts are generally secondary but may occur from fires (smoke/combustion byproducts) or debris and localized disturbance at storage or transfer areas. Compliance failures (e.g., inadequate security, inventory control, or storage practices) can also increase risk of unauthorized access and complicate response effectiveness.

2.2.1.2 Mitigation of Risks

Risk mitigation for storage, transport, and use is achieved through facility controls, security controls, and procedural controls implemented through the site explosives management

program. Explosive materials will be stored only in a locked explosives magazine with 24/7 monitored site access and managed under practices consistent with applicable federal explosives requirements (18 USC 841–848; 27 CFR Part 555), including controlled access and accountability practices sufficient to prevent unauthorized access and to maintain chain-of-custody from receipt through use. Storage and staging practices will maintain separation between detonators/initiators and bulk explosives/blasting agents, and short-duration operational staging (if used) will be controlled to limit quantities, maintain security, and ensure prompt return of unused product to secure storage. Handling and routine use practices will incorporate applicable worker safety requirements, including those reflected in MSHA, and will be supported by training, competency requirements for authorized personnel, and routine inspections.

Transportation of explosive materials will be restricted to designated routes and approved vehicles and will be controlled to minimize ignition sources, prevent product damage, and reduce the likelihood of vehicle incidents. Transportation methods will also avoid prohibited passenger common-carrier transport of explosives consistent with Michigan law. Explosives are transported by a clearly marked truck via a designated road from the explosives storage area to the mine portal.

2.2.1.3 Risk Response Measures

If an accident, loss of control, or credible threat occurs during storage, transport, or routine use, the Operator will prioritize immediate life-safety actions (area isolation, evacuation/ accountability as appropriate, and establishment of exclusion zones) and then stabilize the hazard by securing explosive materials, eliminating ignition sources, and preventing access to the affected area. Notifications will be made in accordance with Section 3, including emergency response activation (911) when public safety or worker safety is threatened. Response actions will be conservative because explosives hazards can escalate rapidly and because secondary detonation risk may exist until the situation is assessed by qualified explosives/blasting personnel.

2.2.2 Blasting Operations

Blasting operations represent the point in the explosives lifecycle where explosive materials are assembled into a firing system and intentionally initiated to fragment rock and advance development or production. Because blasting involves charging, connecting initiation systems, establishing blast exclusion zones, firing, and managing post-blast re-entry.

2.2.2.1 Assessment of Risks

Blasting operations involve specialized handling activities that present distinct high-consequence risks even when storage and transport controls are effective. Credible blasting-related accident scenarios include premature detonation during charging/loading, detonation outside the planned firing sequence, inadequate clearance of personnel from the blast area, misfire or hangfire conditions, initiation system failures, and unplanned blast effects such as flyrock or excessive overpressure. In an underground setting, additional risks include damage to ground support (further discussed in Section 2.11), impacts to ventilation controls, reduced egress, and delayed emergency access if blast effects compromise infrastructure. These risks primarily affect public health and safety but can also create environmental impacts indirectly through fire, ventilation disruption, or damage that affects other containment systems.

2.2.2.2 Mitigation of Risks

Mitigation of blasting risks will be achieved through a combination of advance planning, training programs, qualified oversight, controlled access, communications, monitoring, and post-blast verification. Blasting will be conducted under a written Blast Management/Blasting Plan prepared and implemented by qualified personnel, with blasting activities planned and supervised by a responsible, credentialed blasting professional. The plan will establish blast design and execution controls sufficient to limit unplanned blast effects, manage vibration, and support safe clearance and reentry, consistent with applicable explosives and blasting safety requirements incorporated into site procedures and training. Requirements for safe handling and use will also incorporate applicable Mine Safety and Health Administration (MSHA) standards for surface and underground metal/nonmetal mining operations (30 CFR Parts 56 and 57).

Measures to control flyrock and other unplanned projection hazards will be implemented as appropriate for the blast configuration and location, including the use of physical shielding methods (e.g., blast mats or equivalent industrial controls) and establishment of blast exclusion zones and guarding. Where blasting vibration could affect sensitive receptors or critical mine infrastructure, vibration monitoring will be performed using seismographs at locations identified as vulnerable based on site conditions and operational experience, and results will be reviewed to confirm performance and inform adjustments to blasting practices as needed.

Where blasting occurs in proximity to engineered environmental control features, the integrity of those features will be verified in accordance with applicable permit conditions and site monitoring procedures.

Operational controls will ensure that only trained and authorized personnel handle explosives and support materials during blasting activities and that vehicular and pedestrian access is restricted in the vicinity of blasting for the duration required to establish and maintain safe clearance prior to firing and during post-blast clearance. Blasting communications and warning procedures will be implemented through standardized audible and visual warnings and controlled firing protocols; for scheduled blasts, warnings may include a distinctive air-horn signal in advance of firing and other site-specific warning measures. Public awareness measures (e.g., permanent signage and advance notification for scheduled blasting) will be implemented as described in Section 3.

2.2.2.3 Risk Response Measures

In the event of a blasting incident or credible threat (including suspected misfire/hangfire), the Operator will immediately secure the scene, establish and maintain an exclusion zone, and prevent unauthorized entry until the hazard is assessed and controlled by qualified blasting personnel. Emergency medical response and mine rescue will be activated as applicable, and notifications will be implemented per Section 3. The blast area will not be released for reentry or returned to service until the misfire/hangfire has been managed in accordance with written procedures and the area has been inspected and declared safe by authorized personnel.

2.3 Fuel Storage and Distribution (425.205(1)(a)(iii))

Fuel (e.g., diesel, gasoline (if used), propane, hydraulic oils and lubricants, and related petroleum products) will be stored and distributed on site to support mine development, underground

operations, surface equipment, emergency power generation, and maintenance activities. Fuel will be managed through engineered storage and dispensing systems (e.g., bulk tanks, day tanks, dispensers, transfer lines, and mobile fueling) and administrative controls designed to prevent releases to soil, groundwater, and surface waters and to minimize fire and safety hazards. Spill prevention, secondary containment, surveillance, and reporting will be implemented consistent with Michigan's spill prevention framework under the Part 5 Rules (including PIPP requirements where applicable) and related federal oil spill prevention requirements (SPCC) as applicable to facility design and storage quantities.

2.3.1.1 Assessment of Risks

Fuel storage and distribution present credible accident and failure scenarios that could pose risks to the environment and public health and safety, primarily through releases of petroleum products to the ground surface, stormwater systems, groundwater, or nearby surface waters. Potential release mechanisms include tank rupture; overfill during delivery; failure of hoses, fittings, gaskets, couplings, valves, or dispensers; leaks from transfer piping; malfunction of pumps or automatic shutoffs; damage from vehicle impacts; and releases during fueling of mobile equipment (including underground equipment where applicable). Secondary risks include fire or explosion hazards (particularly near ignition sources), worker exposure hazards during response, and potential impacts to water resources if a release migrates along preferential pathways (e.g., ditches, culverts, floor drains, fractured bedrock, or utility corridors). Because petroleum products are regulated as "oil" under Michigan's spill prevention framework, releases may also trigger reporting and response obligations intended to protect waters of the state.

2.3.1.2 Mitigation of Risks

Risk mitigation will focus on preventing releases, detecting abnormal conditions early, and ensuring that any release is contained before it can migrate off site or reach water resources. The Project will implement a structured spill prevention program that includes facility design standards (tank integrity and siting), secondary containment, operational controls for fueling and transfers, inspection and maintenance procedures, and personnel training. Where applicable based on facility thresholds and applicability determinations, spill prevention planning will be implemented through a PIPP consistent with Michigan's Part 5 Rules, and through an SPCC Plan as applicable to petroleum storage and related federal requirements; these programs collectively emphasize containment, surveillance/inspection, and spill response readiness.

Engineering controls will include the use of appropriate containment for bulk fuel storage (e.g., bermed/curbed containment or double-walled systems), protected dispensing areas, emergency shut-off systems, overfill protection, and fueling pads or stabilized surfaces designed to minimize infiltration and facilitate recovery. Drainage controls (such as diversion of clean runoff away from fuel handling areas, and shutoff or isolation measures where drainage could convey a release) will be used to reduce the likelihood that fuel could migrate to contact water systems or waters of the state. Administrative controls will include controlled delivery procedures (including attendance during transfers), overfill prevention practices, equipment compatibility requirements for hoses and fittings, and restrictions on fueling in areas where containment is not present or where a release would have an elevated likelihood of reaching water. Routine inspections and preventive maintenance will be performed to identify leaks, corrosion, structural

damage, and equipment wear before failure occurs, and spill response materials will be staged to allow immediate containment and recovery.

2.3.1.3 Risk Response Measures

If a fuel release or threat of release occurs, the Operator will take immediate actions to: 1) protect personnel; 2) stop or reduce the source; 3) contain and recover released material; 4) prevent migration to water resources; and 5) complete required notifications and documentation. Immediate response actions will be scaled to the size and setting of the release, with particular emphasis on preventing any discharge to surface waters or infiltration pathways. Reportable spills or releases and environmental emergencies will be reported through Michigan Department of Environment, Great Lakes, and Energy's (EGLE) Pollution Emergency Alerting System (PEAS) hotline (800-292-4706) and other notifications described in Section 3, as applicable.

2.4 Fires (425.205(1)(a)(iv))

Fires have the potential to create immediate risks to worker and public safety and to cause secondary environmental impacts through smoke emissions, infrastructure damage, and contaminated fire-water runoff. This section addresses credible fire scenarios for both surface facilities and the underground mine and identifies prevention/mitigation controls and response measures to protect human health and the environment, consistent with the contingency plan requirements for "fires" under Part 632. Fire prevention and emergency response planning will be supported by site fire prevention and employee emergency action planning elements consistent with applicable MSHA requirements for fire prevention plans and emergency action plans.

2.4.1 Surface Area Fire

Surface area fires include fires involving buildings and structures (e.g., maintenance shops, warehouses, offices), fuel storage and dispensing areas, electrical/utility infrastructure (e.g., generators, transformers), mobile equipment operating on the surface, and vegetation/brush fires that could affect site facilities. Because surface facilities interface with stormwater and contact water controls, surface fires also present the potential for contaminated runoff from fire suppression activities.

2.4.1.1 Assessment of Risks

Surface fires may be initiated by fuel or oil releases contacting ignition sources, electrical faults, welding/hot work, vehicle/equipment malfunctions, lightning, or human activities. The primary public health and safety risks include injury or fatality, smoke inhalation, radiant heat exposure, and potential explosion hazards where flammable vapors are present. Environmental risks may include deposition of soot/particulates, release of combustion byproducts, and mobilization of pollutants (e.g., hydrocarbons, suspended solids) in fire-water runoff that could migrate to ditches, stormwater systems, contact water ponds, or waters of the state if not contained. Fires can also damage containment and water management infrastructure, increasing the likelihood of secondary releases.

2.4.1.2 Mitigation of Risks

Mitigation of surface fire risks will be achieved through a combination of fire prevention planning, ignition source control, housekeeping, equipment maintenance, and fire protection systems. The Project will maintain a fire prevention program that identifies major fire hazards, controls potential ignition sources, and includes procedures to control accumulations of combustible materials and residues, consistent with MSHA fire prevention plan elements where applicable. Preventive measures include controlled storage of flammable/combustible materials, separation of combustibles from ignition sources, management of vegetation and combustible debris near critical facilities, and implementation of hot-work controls (e.g., permits, fire watches, and post-work monitoring) in areas where welding/cutting could ignite combustibles.

Fire protection mitigation will include appropriate extinguishing equipment and systems (portable extinguishers and, where appropriate, fixed suppression or hydrant/foam capability) and routine inspection/maintenance of those systems. Emergency response readiness will be supported through employee training, drills, and clear procedures for reporting fires and evacuating/controlling access, consistent with emergency action planning concepts (alarm, evacuation routes, accounting, and designated responsibilities). Site drainage and water management controls will be used to reduce environmental impacts from suppression activities, including measures to prevent fire-water runoff from entering noncontact drainage routes where feasible and to route impacted water to containment (e.g., contact water ponds) for appropriate management.

2.4.1.3 Risk Response Measures

If a surface fire or credible threat of fire occurs, the Operator will prioritize life safety, rapid notification, and incident stabilization, while preventing secondary impacts to water resources. Initial response will focus on immediate evacuation and access control, followed by firefighting only to the extent it can be safely performed by trained personnel with appropriate equipment, and coordination with local fire services and other responders. Notifications will be implemented in accordance with Section 3 (including public safety agencies as needed), and if fire-related releases threaten environmental media (e.g., oil release, contaminated runoff reaching drainage), reporting through EGLE's emergency reporting channels will be conducted as applicable.

2.4.2 Underground Fire

Underground fires include fires involving diesel or electric mobile equipment, hydraulic systems, electrical distribution components, maintenance/hot work activities underground, conveyor or belt systems, and localized combustibles within underground workings. Underground fire events are addressed separately because smoke and toxic gases can spread rapidly through ventilation circuits, visibility can be reduced, egress routes can be compromised, and emergency response actions must be integrated with mine ventilation, communications, and personnel accountability procedures.

2.4.2.1 Assessment of Risks

Underground fires may originate from equipment engine compartments, hydraulic oil contacting hot surfaces, electrical faults, battery charging areas, frictional heating, or hot work. The primary

risks to public health and safety are acute and high consequences, including smoke inhalation, exposure to toxic combustion gases, disorientation due to reduced visibility, heat stress, and entrapment if egress routes are blocked. Underground fires can also degrade ground support or damage ventilation controls, increasing risk of secondary hazards (e.g., reduced airflow, loss of communications, or inability to safely evacuate). While environmental risks are generally indirect during the acute phase, damage to mine utilities or water conveyance systems and the use of suppression water/foam may create localized contaminated water requiring controlled management once the incident is stabilized.

2.4.2.2 Mitigation of Risks

Mitigation of underground fire risk will be accomplished through layered prevention and protection controls focused on reducing ignition potential, limiting fuel sources, enabling early detection, maintaining safe egress, and ensuring effective emergency response capability. Fire prevention measures will include equipment inspection and maintenance programs, control of combustibles through housekeeping, and management of ignition sources (including hot-work controls and separation of flammable materials from heat sources). Underground mobile equipment will be managed with appropriate fire protection features (e.g., readily available extinguishers and, where appropriate, onboard fire suppression; use of fire-resistant hydraulic fluids where feasible; and protected electrical components). Critical mine safety systems—including underground emergency notification and alarm systems (e.g., stench gas such as ethyl mercaptan injected into the ventilation system to provide rapid mine-wide warning)—will be maintained to support timely evacuation.

All underground personnel will carry a self-contained self-rescuer (SCSR), and mine refuge chambers will be located throughout the mine to support safe refuge and evacuation planning, consistent with MSHA expectations for access to refuge capability (e.g., within an approximate 30-minute travel time). Emergency preparedness mitigation will include written procedures for reporting a fire, emergency evacuation routes and assignments, personnel accountability, and designation and training of personnel with emergency roles, consistent with MSHA emergency action plan concepts (reporting, evacuation, accounting, and rescue/medical duties). The site fire prevention planning framework will support identification of major underground fire hazards and control of ignition sources and combustibles, consistent with MSHA fire prevention plan elements where applicable. Ventilation management procedures (including the ability to adjust ventilation to control smoke migration consistent with the safe evacuation strategy), redundant communications, and routine emergency drills will further reduce consequences by improving response speed and clarity of roles and actions.

2.4.2.3 Risk Response Measures

If an underground fire or credible indication of underground fire occurs (e.g., smoke, heat, burning odor, alarm indications, or equipment fire), the Operator will immediately initiate emergency communications, restrict access, and implement evacuation or refuge actions consistent with underground emergency procedures, prioritizing movement of personnel to fresh air and safe egress. Mine management will activate incident command, coordinate emergency response resources including a mine rescue capability (i.e., a mine rescue team maintained and routinely trained in accordance with MSHA expectations) and manage ventilation and power controls to support safe evacuation and limit smoke migration as conditions allow. Routine evacuation drills, consistent with MSHA requirements and site

procedures, will be conducted to ensure personnel are familiar with evacuation routes, refuge locations, communications, and accountability protocols. Notifications will be implemented via Section 3, including activation of external emergency response resources where appropriate.

2.5 Wastewater Treatment System (425.205(1)(a)(v))

The Project's wastewater collection and treatment system is designed to capture, convey, store, and treat water generated or affected by mining activities, including underground mine water, contact water from material handling areas, tailings facilities, and other mine-affected site waters. Treated water is reused on site to the extent practicable and/or discharged to surface waters in accordance with applicable regulatory authorizations.

The Project does not include, and is not proposing, any discharge of treated or untreated wastewater to the ground or to groundwater. Accordingly, the wastewater management system is not designed or intended to infiltrate, inject, percolate, or otherwise discharge water below the ground surface.

Where treated water is discharged to surface waters, such discharges are regulated under Michigan's authorized National Pollutant Discharge Elimination System (NPDES) permit program, which governs point-source discharges through effluent limitations, monitoring, and reporting requirements protective of surface water quality. Because no discharge to groundwater or the subsurface is proposed, EGLE's Groundwater Discharge Program under Part 31 and the Part 22 Groundwater Quality Rules are not applicable to the Project's wastewater treatment system. Applicable permit applications and compliance reporting for surface water discharges are administered through EGLE's MiEnviro system.

2.5.1 Assessment of Risks

Potential accidents or failures involving the wastewater collection and treatment system include loss of pumping or conveyance capacity (e.g., pump failure, power interruption, pipeline rupture, valve malfunction, blockage, or freeze-related damage), loss of effective storage capacity (e.g., reduced freeboard due to high inflow conditions, sediment or sludge accumulation, or constrained routing), and treatment process upsets (e.g., chemical feed failure, pH control failure, equipment malfunction, instrumentation or Supervisory Control and Data Acquisition [SCADA] failure, solids handling failure, or operator control errors).

A worst-case credible scenario for the wastewater treatment system would involve a simultaneous loss of electrical power and high inflow conditions, such as might occur during a major storm event coincident with a power disruption. Under this scenario, active pumping, conveyance, and treatment functions could be temporarily unavailable while inflows to collection systems continue. If storage and equalization capacity were exceeded before power and treatment capability were restored, there would be an increased risk of overtopping, uncontrolled discharge to stormwater pathways, or release of untreated or partially treated water.

Additional credible scenarios include prolonged treatment process upsets that reduce treatment effectiveness, or mechanical failures that limit the ability to route water to treatment or reuse. These scenarios can create environmental risks if untreated or inadequately treated water reaches surface waters, wetlands, or other receptors, potentially resulting in exceedances

of applicable water quality standards, acute or chronic aquatic impacts, or degradation of downstream water quality.

Public health and safety risks associated with wastewater system failures are generally secondary but may arise if releases threaten drinking water sources (e.g., private wells or surface water intakes, where present), or if hazardous conditions develop for site personnel or responders, such as unstable pond slopes, electrical hazards, or exposure to treatment chemicals. The severity of consequences is greatest when failures coincide with high inflow conditions, limited response time, or concurrent power disruptions, which can reduce the effectiveness of active controls and compress decision-making windows.

2.5.2 Mitigation of Risks

Mitigation of wastewater treatment system risks is achieved through a combination of conservative system design, operational controls, monitoring and maintenance programs, and contingency capacity, with the objective of maintaining containment of mine-affected water and preventing any uncontrolled or noncompliant discharge.

The system incorporates operational buffers, such as equalization and storage capacity and controlled routing, to accommodate variable inflows and temporary loss of active treatment capability. These features are designed to allow wastewater to remain within engineered containment during upset conditions, including short-term loss of pumping or treatment, until normal operations can be restored. One of the identified upset risks is loss of power; therefore, critical pumping systems will be supported by backup power, including the pump(s) used to transfer water from the contact water pond to the tailings disposal facility and selected critical pumps within the water treatment plant (to maintain containment and controlled routing, but not full treatment plant operation). For surface water discharges, compliance is maintained through NPDES permit-based effluent limits, monitoring, and reporting requirements, which define allowable discharge conditions and corrective actions.

Operational mitigation measures include redundancy for critical components where practicable (e.g., standby pumps, alternate routing, spare parts availability), preventive maintenance and inspection programs for pumps, pipelines, valves, and treatment equipment, and winterization and freeze protection measures appropriate for Upper Peninsula conditions. Routine inspections of ponds, conveyance features, and containment structures are conducted to identify leaks, erosion, settlement, or capacity limiting conditions before a failure occurs.

Monitoring and control systems—including level sensors, flow measurement, alarms, and operator oversight—provide early warning of rising water levels, abnormal flows, or off-normal treatment performance so corrective actions can be implemented before storage capacity is exceeded or a noncompliant discharge develops. Treatment chemical storage and feed systems are managed under controlled handling, secondary containment, and inspection practices to reduce the likelihood that a chemical supply issue or spill could impair treatment effectiveness or create additional hazards.

The overall mitigation strategy is to ensure that the wastewater system maintains the ability to: 1) keep mine-affected water within engineered containment; 2) route water to treatment or reuse reliably when systems are available; and 3) avoid any bypass or discharge that would violate permit conditions, even under credible worst-case upset scenarios.

2.5.3 Risk Response Measures

If a wastewater collection or treatment system failure occurs, or if monitoring indicates a credible threat of loss of containment or treatment performance, the Operator will immediately act to protect personnel, stabilize the system, maintain containment, and prevent an unauthorized discharge. Response actions will be prioritized to: 1) stop or reduce inflows to the affected component where feasible; 2) restore conveyance and/or treatment capacity; 3) divert flows to available backup storage/equalization; and 4) isolate and repair the failed component. Notifications and documentation will be implemented consistent with Section 3, and environmental emergencies or releases posing a sudden threat to the environment will be reported via EGLE's PEAS hotline (800-292-4706), as appropriate.

2.6 Settling Pond or Tailings Disposal Area Embankment Failure (425.205(1)(a)(vi))

Settling ponds and tailings disposal areas (including any impoundments, dams, bermed basins, and associated seepage collection and conveyance systems) are engineered structures intended to contain solids and water and to provide controlled routing to treatment, reuse, or permitted discharge systems. An embankment failure is a low-frequency, high-consequence event that can pose immediate risks to public health and safety (e.g., rapid downstream flows, inundation, debris hazards) and can also create significant environmental impacts through uncontrolled release of solids and impacted water.

A worst-case credible embankment failure scenario would involve overtopping or structural instability during an extreme precipitation or rapid snowmelt event, potentially compounded by concurrent loss of active water management capability (e.g., pumping or treatment limitations due to power disruption or mechanical failure). Under this scenario, elevated water levels and reduced freeboard could lead to partial or full breach of an embankment, resulting in rapid release of water and solids beyond engineered containment.

Because the consequences of an embankment failure depend on the physical characteristics of the structure and the chemistry and reactivity of the contained materials and water, response under this section is implemented in coordination with Section 2.1 (toxic and/or acid-forming materials), Section 2.5 (wastewater collection and treatment system impacts), and Section 2.9 (natural hazards such as extreme precipitation and snowmelt that may contribute to overtopping or instability).

2.6.1 Assessment of Risks

Embankment failure scenarios can range from localized sloughing or erosion to partial breach, to full breach failure. Credible initiating mechanisms include overtopping during extreme precipitation or rapid snowmelt, spillway blockage or insufficient freeboard, internal erosion or piping, instability caused by weak foundation conditions or elevated pore pressures, erosion of slopes or crest, settlement or deformation that reduces freeboard, seismic loading (generally low likelihood in the Upper Peninsula but included as a hypothetical stressor), and damage to appurtenant structures such as valves or outlet works.

Under a worst-case credible scenario, a breach could occur with little warning during a high-inflow event, resulting in rapid downstream flow that could impact site personnel, access roads, downstream drainage features, wetlands, streams, and potentially off-site receptors

depending on travel paths and site topography. Public and personnel safety risks are highest where rapid release limits warning time and safe access or egress routes.

Environmental risks include deposition of solids in wetlands or surface waters, elevated turbidity and suspended solids, and release of impacted water requiring treatment, recovery, or downstream mitigation. Where tailings or pond water has acid-forming or metal-mobilization potential, the chemical risk component is addressed under Section 2.1, which informs sampling, containment, and mitigation actions following stabilization of the structure.

Additional risks arise for responders, including unstable or saturated ground conditions, compromised access, damaged infrastructure, and electrical hazards associated with disrupted monitoring or control systems. The severity of consequences increases when an embankment failure coincides with extreme hydrologic loading, reduced freeboard, or concurrent loss of active water management controls, which can limit response options and compress decision-making timeframes.

2.6.2 Mitigation of Risks

Mitigation is achieved through conservative engineering design, construction quality assurance/quality control (QA/QC), operational controls, monitoring and inspection programs, and clearly defined TARPs intended to detect adverse trends and escalate actions before an embankment failure occurs. Key mitigation elements include maintaining adequate freeboard, ensuring reliable spillway and outlet capacity, managing deposition practices to preserve design geometry and stability, maintaining seepage collection and drainage systems, and performing routine inspections of embankment crests, slopes, toe areas, and appurtenant structures.

Instrumentation, where installed, such as piezometers, settlement monuments, seepage flow measurement, and visual seepage observation, is used to identify trends indicating elevated pore pressures, unexpected deformation, or changing seepage conditions. Seasonal readiness measures appropriate for Upper Peninsula conditions (e.g., spring snowmelt and high-intensity rainfall periods) prioritize freeboard preservation, drainage maintenance, and spillway or ditch clearing to reduce overtopping risk.

Where settling ponds or tailings areas interface with contact water routing, mitigation is coordinated with Section 2.5 to ensure storage, pumping, and treatment routing maintain adequate buffer capacity under upset conditions. Where reactive materials are present, mitigation is coordinated with Section 2.1 to ensure seepage and contact water are managed to prevent chemical impacts.

2.6.3 Risk Response Measures

If an embankment failure is observed, suspected, or credibly threatened—such as through rapid loss of freeboard, development of cracks or deformation, new or increasing seepage or turbidity at the toe, signs of internal erosion or piping, unusual settlement, or overtopping—the Operator will immediately prioritize life safety and downstream protection, initiate incident command procedures, and implement actions to stabilize the structure and prevent or minimize release.

Response actions include immediate notification and coordination with public safety agencies and regulators consistent with Section 3. Because a breach or imminent breach represents both a public safety emergency and a potential environmental emergency, notifications may include

911/local responders and reporting to EGLE via the PEAS at 800-292-4706 where a release or potential release to air, land, or water exists.

2.7 Air Emissions (425.205(1)(a)(vii))

Air emissions associated with the Project may include fugitive dust from material handling and traffic, particulate emissions from crushing/conveying/stockpiling activities, combustion and particulate emissions from blasting, and combustion emissions from engines, generators, heating equipment, and other process equipment. Air emissions are regulated through EGLE's Air Quality Division (AQD) under the Air Pollution Control Rules, including permitting requirements such as Permit to Install (PTI) and, if applicable, Operating Permits (Renewable Operating Permit/Title V). This section addresses air emissions that may affect ambient air quality and off-site receptors, including releases associated with equipment malfunctions, loss of dust controls, or other conditions that could result in abnormal or excess emissions subject to applicable air requirements.

Underground atmospheric hazards that primarily present worker health and safety risks, such as oxygen deficiency, blasting fumes, diesel particulate matter, and naturally occurring mine gases, are managed through the mine's safety, ventilation, monitoring, and emergency response procedures (including alarm/evacuation and personnel accountability protocols). To the extent an underground event could reasonably result in a release to the surface environment (for example, smoke or fumes venting at portals/shafts), the response measures in this section apply in coordination with Section 2.4 (Fires) and the notification procedures in Section 3.

2.7.1 Assessment of Risks

Potential accidents or failures that can result in elevated air emissions include loss or degradation of dust controls (e.g., water/suppressant systems not operating, damaged enclosures, ineffective wind controls, or breakdowns in housekeeping), equipment malfunctions that increase combustion emissions (e.g., engine problems, generator issues), and failures of air-cleaning or control equipment where installed. Fugitive dust is a key risk pathway during dry or windy conditions and during high-activity periods (e.g., earthwork, haulage, stockpile management), and it can affect public health through inhalable particulate exposure and nuisance conditions (visibility/soiling). In Michigan, fugitive dust sources at mining operations are subject to opacity-based performance requirements, including limits applicable to roads/lots/storage piles and other fugitive dust sources, as determined by Michigan's Method 9D for visual opacity.

Air emission risks also include the potential for "excess emissions" during abnormal operating conditions, start-up/shutdown, or malfunctions. Michigan law and rules address malfunctions and require that sources be operated to minimize emissions during these events and that certain malfunctions/excess emissions be reported to the EGLE within specified timeframes. In addition to regulatory compliance impacts, elevated dust or combustion emissions can create worker and community concerns and may trigger complaints that require additional controls or corrective actions.

2.7.2 Mitigation of Risks

Mitigation is achieved through air permitting compliance, preventive maintenance, operational controls for dust and combustion sources, and monitoring/inspection programs that detect

abnormal conditions early. The Project will obtain and comply with all applicable AQD authorizations, including PTIs for potential sources of air pollution as required under Michigan's air permitting framework, and will implement the operational limits, monitoring, and reporting conditions specified in those permits.

Fugitive dust mitigation will be implemented through an integrated set of control practices such as water or dust-suppressant application, minimizing drop heights during loading/unloading, prompt cleanup of spillage, enclosures or covered conveyance where appropriate, paved access roads, sweeping, speed management, and other methods consistent with typical fugitive dust control approaches recognized in Michigan guidance and rules. Where the EGLE requests it based on ambient measurements or substantive complaints, the Project will prepare and implement a written fugitive dust control program that uses combinations of available technologies and operating practices reasonably necessary to control fugitive dust emissions and includes recordkeeping and implementation schedules, consistent with R 336.1371.

For emission sources and air-cleaning/control devices where malfunction could lead to excess emissions, the Project will implement preventive maintenance and surveillance practices and, if requested by the department, will prepare a Malfunction Abatement Plan (MAP) that specifies preventive maintenance, monitored operating variables, and corrective procedures/operational changes to address malfunctions or failures that could cause exceedances. Mitigation also includes operational readiness actions during adverse conditions (e.g., high winds) such as reducing or pausing dust-generating activities that cannot be effectively controlled, consistent with permit conditions and dust program triggers.

2.7.3 Risk Response Measures

If abnormal air emissions occur or are likely to occur (e.g., visible dust exceeding expected conditions, control system failure, equipment malfunction causing excess emissions, or credible community impact), the Operator will immediately implement actions to reduce emissions, restore controls, and document and report the event as required. Response actions will be proportional to the event's severity and will prioritize: 1) protecting health and safety; 2) stopping or reducing the emission source; and 3) restoring compliance with permit and rule requirements. Where air release also constitutes an environmental emergency (e.g., a significant release or potential release threatening public health or the environment), the Operator will also utilize EGLE's emergency reporting channels as applicable.

2.8 Hazardous Substance Spills (425.205(1)(a)(viii))

Hazardous substances used, stored, or handled at the Project may include process reagents, treatment chemicals, maintenance chemicals (e.g., solvents, cleaners), laboratory chemicals, and other regulated products. Spills can occur during receiving, storage, transfer, use, or waste management activities and may pose risks to public health and safety and the environment if released into soil, stormwater, surface water, or groundwater. This section addresses spill scenarios for hazardous substances (excluding petroleum fuels addressed in Section 2.3) and identifies prevention/mitigation controls and response measures. Spill prevention planning and response practices will be coordinated with applicable Michigan spill prevention and reporting frameworks, including EGLE emergency reporting through the PEAS and, where applicable, Part 5 Rules requirements for regulated polluting materials.

2.8.1 Assessment of Risks

Hazardous substance spills may result from container failure (e.g., drums/totes), transfer hose or coupling failure, valve malfunction, overfilling, equipment impacts, improper storage/stacking, or operator error during handling. Credible spill locations include chemical storage rooms, reagent unloading/receiving areas, maintenance shops, laboratories, water treatment chemical feed areas, and waste accumulation areas. Risks to the environment include direct contamination of soil, migration to groundwater via permeable soils or preferential pathways, and transport to surface waters through ditches, culverts, stormwater conveyances, or contact water systems. Risks to public health and safety include acute exposure through inhalation of vapors, skin/eye contact, reactivity hazards (e.g., incompatible chemical mixing), and fire/explosion hazards for flammable substances.

A spill can also trigger multiple notification and reporting obligations depending on the chemical, quantity, medium impacted, and permit conditions. EGLE notes that incidents involving the release or potential release of hazardous chemicals into air, land, or water can constitute environmental emergencies reportable through PEAS. Additionally, Michigan's release reporting guidance emphasizes that releases may be reportable under multiple state and federal regulations and that facility permits and pollution prevention plans can contain additional reporting requirements beyond general guidance documents.

2.8.2 Mitigation of Risks

Mitigation focuses on preventing spills, limiting the volume that could be released, and ensuring that any spill is rapidly contained before it can reach water resources or create exposure hazards. The Project will implement chemical management practices that include appropriate storage compatibility and segregation, secondary containment for containers and transfer areas as applicable, controlled receiving and transfer procedures, labeling and inventory controls, and routine inspections to identify deteriorated containers, leaks, or unsafe storage conditions. Spill prevention planning and surveillance practices will be integrated with applicable regulatory programs, including Michigan's Part 5 Rules framework for regulated polluting materials (where applicable) and site-specific spill procedures that align with the Project's emergency notification and response structure.

Mitigation will also include maintaining readily accessible spill response equipment (absorbents, neutralizing agents where appropriate, overpack drums, drain covers, personal protective equipment) at locations with higher spill potential, and ensuring personnel who handle hazardous substances are trained in spill prevention, immediate response actions, and safe handling consistent with Safety Data Sheet requirements. Where hazardous substances are present at quantities that trigger community right-to-know planning or reporting, the Project will manage inventories and emergency planning interfaces consistent with SARA Title III program expectations and local emergency planning coordination.

2.8.3 Risk Response Measures

If a hazardous substance spill or threat of spill occurs, the Operator will immediately implement actions to protect personnel, stop the release, contain the material, prevent migration to water resources, recover and effectively manage contaminated materials, and complete required notifications and documentation. Environmental emergencies will be reported through EGLE's PEAS hotline (800-292-4706) as appropriate, and EGLE notes that many incidents reportable to

EGLE may also warrant reporting to the federal National Response Center (NRC). For spills requiring a written follow-up report, EGLE provides an optional “Spill or Release Report” form (EQP3465) that can be used to compile and submit the relevant information, recognizing that some regulations require specific forms and procedures.

2.9 Other Specific Natural Risks (425.205(1)(a)(ix))

This section addresses natural hazard scenarios that could affect the Project’s ability to operate safely and maintain environmental controls. Natural hazards of principal relevance in Michigan’s Upper Peninsula include flooding (including intense precipitation and snowmelt-driven runoff), severe thunderstorms and occasional tornadoes, and severe winter weather (including blizzards and extreme snow loads), with earthquakes considered a low-frequency hazard that can still create high-consequence failures in critical infrastructure. Michigan has become warmer and wetter over time, and EGLE notes that extreme precipitation events are a key climate concern, reinforcing the importance of designing and operating water and containment systems with resilience to high inflow conditions.

Natural hazards can affect both surface and underground components, but the dominant pathways differ. Surface risks typically involve stormwater/runoff management, access and power reliability, facility integrity (e.g., containment systems), and potential releases through overtopping or damage, while underground risks more often involve power/ventilation reliability, access/egress constraints, and localized ground control impacts (e.g., rockfall hazards or damaged utilities) rather than direct off-site environmental releases. Where natural hazard consequences overlap with other contingency categories (e.g., fires, power disruption, wastewater system upset), response actions are implemented in coordination with those sections as well.

2.9.1 Floods

Flooding in the Upper Peninsula is most relevant to the Project as a public and personnel safety hazard because it can rapidly compromise road access, bridges/culverts, electrical service, communications, and slope stability, thereby limiting safe site access/egress and delaying emergency response. Flood drivers in Michigan commonly include high antecedent soil moisture that limits infiltration, large spring snowmelt volumes, and intense or prolonged rainfall events, which can cause high flows and localized inundation even when water levels were previously normal. While flooding can also affect water management systems, those pathways are addressed primarily under Section 2.5; this subsection emphasizes the safety and operational continuity consequences of flooding and flood-related erosion.

2.9.1.1 Assessment of Risks

Flood conditions can create safety risks on the surface by undermining or overtopping access roads, washing out culverts, destabilizing embankments and ditches, and creating standing or moving water hazards for vehicles and pedestrians. Because flood events can occur quickly during intense precipitation or rapid snowmelt, the Project may face reduced ability to move personnel, mobilize emergency resources, or maintain routine inspections. Flooding can also cause power outages (e.g., substation impacts, downed lines, damage to site electrical infrastructure) and can disrupt communications, which increases risk during any concurrent incident requiring coordinated response.

In the Upper Peninsula, flooding is frequently paired with erosion and ground saturation that can elevate the likelihood of localized landslides/slope failures on steep cut/fill slopes, ditch banks, and stockpile or facility slopes. These failures can create immediate life-safety hazards (collapse, entrapment, equipment rollover) and can block primary or secondary access routes.

Flood impacts to the underground mine are typically indirect. Underground workings are generally protected from surface runoff by design, but flooding can still threaten underground safety by disabling or restricting the surface-to-underground interface (portal/shaft access), interrupting power needed for ventilation and communications, and limiting the ability of personnel or responders to reach the mine. Under these conditions, the principal underground safety risk is not rapid inundation, but loss of critical services (ventilation/communications/ egress support) and delayed emergency response capability.

2.9.1.2 Mitigation of Risks

Flood safety mitigation is achieved through resilient access planning, infrastructure protection, and operational readiness that reduces the likelihood that personnel will be exposed to flood hazards or stranded by compromised routes. The Project will maintain and inspect site access roads and drainage crossings (culverts/ditches) to preserve flow conveyance and reduce washout risk, particularly ahead of spring melt and forecast heavy rain. Flood mitigation also includes identifying and maintaining alternate access routes where feasible and ensuring that critical emergency access points (e.g., to portals/shafts, first-aid locations, electrical rooms, and communication hubs) remain serviceable during high water conditions.

Because Michigan has experienced increased intense precipitation patterns and extreme precipitation is recognized as a key statewide climate concern, the Project's readiness approach includes weather-triggered actions that scale inspections, staffing, and site controls as conditions intensify. This includes pre-staging resources for access maintenance (e.g., barriers, signage, pumps where needed for roadway dewatering, and debris removal capability) and maintaining backup power and fuel readiness to support critical safety systems during outages, consistent with the Project's broader power disruption planning.

Slope stability risk mitigation during flood-prone periods includes routine observation of steep slopes, ditch banks, and other erosion-prone features; prompt repair of erosion; and conservative restrictions on equipment operation near saturated or visibly distressed slopes. Where stormwater concentrates, mitigation includes energy dissipation and erosion control measures that reduce scour and help preserve road and slope integrity.

2.9.1.3 Risk Response Measures

When flood conditions are forecast or observed, the Operator will prioritize life safety, access control, and continuity of critical services. Response measures will focus on keeping personnel out of hazardous areas, maintaining safe ingress/egress, and restoring essential functions (power/communications/access) before resuming normal operations.

2.9.2 Severe Thunderstorms or Tornadoes

Severe thunderstorms occur seasonally across Michigan and can affect the Upper Peninsula through high winds, lightning, intense rainfall, and hail; tornadoes are less frequent than in southern portions of the state but remain a credible hazard, especially for wind-driven damage

and power disruption. Severe convective storms are relevant because they can rapidly damage surface infrastructure and create cascading effects across power, communications, and water management systems. Michigan's climate trend toward more intense precipitation events further increases the relevance of storm-driven runoff impacts.

2.9.2.1 Assessment of Risks

On the surface, severe storms can cause power outages, damage to overhead lines and structures, windborne debris impacts, lightning-induced fires, and intense rainfall that rapidly loads stormwater/contact water systems. These failures can impair treatment systems, reduce containment freeboard, and create conditions for spills or releases if secondary containment or conveyance is damaged. Thunderstorms can also increase the likelihood of tree fall and access road blockage, complicating emergency response and logistics.

Underground, the primary pathway is typically loss of surface power and ventilation support, which can affect underground safety conditions even if underground workings are physically shielded from wind. Severe storms can also interrupt communications and limit safe access to portals/shafts. If lightning or wind causes a fire at surface infrastructure connected to the mine, underground smoke migration risks must be considered through ventilation management and emergency response protocols.

2.9.2.2 Mitigation of Risks

Storm and tornado mitigation relies on ensuring that critical systems are resilient to wind and lightning impacts and that the site can safely operate through power disruptions and high inflow conditions. Mitigation includes lightning protection and grounding for critical structures, securing outdoor storage and equipment to reduce windborne hazards, maintaining vegetation management near critical lines and structures, and implementing design standards for wind loads as applicable. Operational mitigation includes storm monitoring, pre-storm securing of materials, and readiness actions to protect containment and treatment systems when heavy rain is forecast. Because power loss is a common storm consequence, mitigation is linked to backup power and prioritized restoration protocols for ventilation, pumping, and communications (Section 2.10).

2.9.2.3 Risk Response Measures

When a severe thunderstorm or tornado warning occurs or storm damage is observed, the Operator will prioritize life safety and rapid stabilization of critical functions.

2.9.3 Blizzards

Blizzards and severe winter storms are highly relevant in the Upper Peninsula due to lake-effect snow, prolonged winter conditions, and heavy snow loads that can stress infrastructure and disrupt access. Michigan building code snow load tables reflect notably higher ground snow loads in multiple Upper Peninsula counties, underscoring the regional severity of snow and ice hazards.

2.9.3.1 Assessment of Risks

Surface risks during blizzards include loss of access and transportation disruptions, impaired emergency response, reduced ability to deliver supplies (fuel, reagents), freezing or blockage of

drainage features, damage to structures from snow/ice loading, and power outages caused by heavy snow and ice accumulation on lines and trees. Snow drift and ice formation can block critical air intakes/outlets, doors, and emergency equipment locations, and can reduce the effectiveness of monitoring and inspection programs during the event. These conditions can indirectly increase environmental risk if access limitations prevent timely management of contact water levels or repairs to damaged infrastructure.

Underground, winter storms generally do not directly alter underground physical conditions, but they can affect the mine through surface-to-underground interfaces, including portal/shaft access, ventilation intake obstruction, loss of surface power affecting ventilation and pumping, and reduced responder access. Winter conditions can therefore amplify the consequences of otherwise manageable equipment upsets by delaying response, repair, and deliveries of fuels (diesel or propane) and explosives.

2.9.3.2 Mitigation of Risks

Blizzard mitigation focuses on winterization, access maintenance, and ensuring continuity of critical functions. Mitigation measures include structural design and maintenance consistent with applicable snow load considerations, proactive snow removal plans for access roads and critical areas, winterization of piping and conveyance (freeze protection), and operational preparations to maintain sufficient inventories of critical supplies during periods when deliveries may be delayed. Backup power and fuel planning is particularly important because severe winter storms can cause prolonged outages, and mitigation therefore aligns with Section 2.10 (Power Disruption) priorities to maintain ventilation, pumping, and communications.

2.9.3.3 Risk Response Measures

During severe winter storm conditions, the Operator will implement safety-based operational restrictions and prioritize maintaining access to critical infrastructure and emergency response capability.

2.9.4 Earthquakes

Earthquakes are not expected to be a primary natural hazard affecting the Project in Michigan's Upper Peninsula; however, they are addressed here as a low-probability, hypothetical event because even infrequent ground motion can create disproportionate consequences if critical infrastructure is impacted. This subsection therefore focuses on the types of vulnerabilities that could be affected if an earthquake were to occur, and the corresponding actions that would be taken to confirm safety and maintain environmental controls. The 2023 US 50-State National Seismic Hazard Model by the United States Geological Survey (USGS) rates the Upper Peninsula of Michigan less than 5% chance of slight damaging earthquake shaking in 100-year period.

2.9.4.1 Assessment of Risks

Under a hypothetical earthquake scenario, the principal risk mechanism is indirect: ground motion could damage surface systems that support environmental control and safe operations, such as electrical infrastructure, pipelines, tanks, pumps, and water management components (e.g., ditches, ponds/basins, conveyance structures), potentially creating leaks or reducing the reliability of pumping, storage, or treatment. Underground, the most credible impacts would be localized ground control effects (e.g., rockfall in a limited area), damage to ground support, and

deformation or misalignment of underground utilities (power/communications, ventilation controls, dewatering lines), which could create short-term safety hazards or constrain access and egress. Environmental impacts would generally be secondary, occurring only if damage leads to a loss of containment, conveyance failure, or a cascading upset in the water management system.

2.9.4.2 Mitigation of Risks

Because earthquake likelihood is low, mitigation is based on robust baseline engineering and operational resilience rather than earthquake-specific operational controls. Critical systems are designed, maintained, and inspected to perform reliably under a range of load conditions, with redundancy and contingency capacity prioritized for functions that protect the environment and worker safety (e.g., standby pumping capacity, backup power for essential systems, and conservative factors of safety for critical containment and conveyance features). Readiness is strengthened through clear post-event inspection protocols so that, if an earthquake were felt or suspected, the Project can quickly verify the integrity of structures, utilities, and environmental controls before resuming normal operations.

2.9.4.3 Risk Response Measures

If an earthquake is felt on site, reported in the area, or otherwise suspected to have affected Project facilities, the Operator will treat the event conservatively: operations may be paused as needed, personnel safety will be confirmed, and targeted inspections will be completed before returning systems to service. Response actions are intended to rapidly identify and control any secondary impacts (e.g., leaks, power disruption, impaired pumping/treatment) that could create a release pathway.

2.10 Power Disruption (425.205(1)(a)(x))

Power disruption includes any unplanned loss, reduction, or instability of electrical power that affects surface facilities, underground operations, or both. The Project's power supply is configured using two power sources; natural gas-fired generation as the primary on-site power source and local electoral grid as the secondary source to support continuity of operation. Because the Project relies on continuous electrical power for underground ventilation, communications, monitoring and alarm systems, dewatering and pumping, process control systems, and wastewater treatment controls, power disruption can create immediate public health and safety risks and may also increase the likelihood of secondary environmental impacts if water management or containment systems cannot be maintained.

2.10.1 Assessment of Risks

Power disruptions may occur due to severe weather (wind, ice, lightning), utility outages, equipment failure (turbine trip, transformer/switchgear failure, breaker/relay issues), fuel supply interruption to turbines, accidental line damage, or planned maintenance that results in an unplanned loss of service. Because the site uses multiple power sources, risk scenarios include both complete loss of power and partial power loss (e.g., loss of one source with remaining sources available but requiring transfer or load shedding). Transition events (e.g., turbine trip with transfer to grid) can also create short-term instability that affects sensitive controls and pumps.

A worst-case credible power disruption scenario for the Project would involve a simultaneous interruption of the natural gas supply (for example, due to pipeline damage or broader supply chain disruptions) and a loss of grid power without advance warning. Under this scenario, all electrically powered systems would deenergize abruptly until power is restored. The consequences of such an event are primarily related to worker safety, underground mine conditions, and the integrity of water management and process systems.

In the underground mine, loss of power would result in the cessation of ventilation and active dewatering, requiring personnel to evacuate the underground workings in accordance with established emergency procedures. Although overall inflow rates are expected to be low, loss of pumping does not need to result in full mine reflooding to cause operational or safety impacts; even localized water level increases can reduce sump capacity, inundate low points, impair access routes, or affect equipment and ground conditions. Loss of underground communications could also increase the risk of vehicle-to-person or vehicle-to-vehicle interactions during evacuation.

At the surface, an abrupt loss of power would result in the shutdown of beneficiation and process facilities, including grinding and chemical treatment circuits. Sudden loss of power to rotating equipment and controlled chemical systems could result in equipment damage, process upsets, or the need for controlled restart and inspection prior to resuming operations. Power loss could also temporarily limit pumping, monitoring, and alarm functions associated with water management systems, increasing reliance on storage capacity and manual oversight until power is restored.

Environmental risks associated with power disruption are generally indirect and occur when loss of power disables systems that prevent releases, such as wastewater collection and treatment equipment, transfer pumps used to maintain containment freeboard, or monitoring and alarm systems that provide early warning of abnormal conditions. If a power disruption contributes to a release or potential release of oil, hazardous chemicals, or other regulated materials, the situation may meet the definition of an environmental emergency reportable to the PEAS.

2.10.2 Mitigation of Risks

Mitigation of power disruption risks focuses on protecting personnel, maintaining control of critical systems during loss of power, and enabling safe shutdown and recovery, rather than ensuring uninterrupted operations under all circumstances. The Project's mitigation strategy recognizes that loss of both the primary on-site power source and grid power is a credible scenario and is designed to manage the consequences safely and effectively; where available and appropriate, portable generators may be used to operate critical pumps as needed.

The Project will designate essential electrical loads and operating priorities, including underground ventilation and communications systems, mine monitoring and alarm systems, critical dewatering and water-management pumps, wastewater treatment controls, and emergency lighting. Electrical system design and operating procedures prioritize controlled transitions between available power sources where possible and emphasize fail-safe behavior for systems that may deenergize abruptly. Where power is lost without warning, systems are designed to default to conditions that support safe evacuation and prevent uncontrolled releases.

Personnel protection is the primary mitigation objective during power disruption. Underground operations are supported by clearly defined evacuation and egress procedures, alarm and notification systems, and accountability protocols to ensure personnel can exit the mine safely following loss of ventilation, communications, or pumping capacity. Training and emergency action planning address scenarios involving degraded visibility, loss of communications, and reduced mobility, with emphasis on minimizing vehicle-to-person and vehicle-to-vehicle interaction risks during evacuation.

Preventive mitigation measures include inspection, testing, and maintenance programs for electrical infrastructure and power-dependent systems, including generation equipment, transformers, switchgear, protective relays, control systems, and communications networks. These programs are intended to reduce the likelihood of equipment-related outages and to improve system reliability during severe weather events and other high-risk conditions, recognizing that not all power disruptions can be prevented.

Mitigation of environmental risks associated with power disruption is achieved primarily through system design and operational controls rather than continuous power availability. Water management systems incorporate storage capacity, passive containment features, and conservative freeboard assumptions to provide resilience during temporary loss of pumping or treatment capability. Monitoring and alarm systems are used to identify abnormal conditions promptly upon restoration of power or during partial system recovery, allowing corrective actions to be implemented before environmental impacts occur.

Together, these mitigation measures reduce the likelihood that a power disruption results in injury, uncontrolled releases, or escalation into other contingency categories, while acknowledging that safe shutdown and controlled response are the appropriate outcomes under worst-case loss-of-power scenarios.

2.10.3 Risk Response Measures

When a power disruption occurs, the Operator will prioritize personnel safety, stabilization of critical systems, and prevention of secondary releases. Initial response will focus on confirming the extent of the outage (turbine-only, grid-only, partial site distribution, or full loss), stabilizing power using available sources (NLG or grid backup, depending on the outage), and prioritizing power restoration to areas or equipment designated as essential electrical loads (e.g., life-safety systems, communications, ventilation, and critical pumping/containment equipment). The Operator will restrict access to hazardous work areas until lighting, communications, and critical safety systems are confirmed operational. Underground response actions will prioritize ventilation and communications and will be implemented in coordination with underground emergency procedures and accountability protocols.

2.11 Unplanned Subsidence (425.205(1)(a)(xi))

Unplanned subsidence refers to unintended ground movement or collapse that may occur as a result of underground void creation or pillar/roof instability and that could affect underground workings, surface facilities, or public safety. The proposed mine will use an underground room-and-pillar method with no backfill, which means long-term stability relies on appropriate pillar sizing, panel layout, barrier pillars, and ground support design rather than void filling. In addition, the Project is adjacent to the historic White Pine underground mine that operated from

1952 to 1995, which introduces legacy uncertainties (e.g., unknown void geometry, pillar condition, and groundwater pathways) that must be considered in subsidence risk screening, monitoring, and response planning. This section addresses potential subsidence-related failure scenarios and the response measures that will be followed to protect public health and safety and prevent secondary environmental impacts. Potential interaction with the historic White Pine Mine is addressed through review of available legacy records and conservative boundary-area design and operating controls.

2.11.1 Assessment of Risks

For a room-and-pillar mine without backfill, subsidence risk is typically associated with: 1) localized roof instability or progressive roof failure within mined panels; 2) pillar yielding/crushing (local or progressive); 3) failure of barrier pillars between panels or near surface features; and 4) interactions with legacy workings where old excavations may reduce effective support or create unexpected stress redistribution. Potential impacts differ between underground and surface.

Underground risks are most immediate and include localized rockfall, ground support damage, deformation of travel ways, and loss of access/egress routes. Subsidence-related deformation can also damage underground utilities (power, communications, ventilation controls, water lines), which may create cascading hazards such as reduced ventilation effectiveness or constrained emergency response.

Surface risks from unplanned subsidence are expected to be low overall because the underground mine will be developed at substantial depth and will be designed and operated to maintain stability. Nevertheless, as a conservative contingency consideration, portions of Project surface features may overlie the underground mine, and residential properties occur east of the site fence line above portions of the underground workings. In the unlikely event of surface expression, potential manifestations could include localized settlement, cracking, or shallow depressions. The primary potential consequences would be localized public or personnel safety concerns and secondary effects such as minor changes to surface drainage or impacts to ditches, culverts, or utilities along access corridors. Accordingly, the contingency focus is on prompt recognition, access control, and evaluation/corrective actions if ground movement is observed.

2.11.2 Mitigation of Risks

Consistent with the no-backfill design, long-term stability will rely on appropriate pillar sizing, extraction ratios, panel layout, barrier pillars, and ground support standards, with additional conservatism applied near boundaries and areas of elevated uncertainty. The proximity of the historic underground mine is addressed through boundary-focused design and operational planning intended to limit stress redistribution and interaction with unknown or degraded legacy workings.

Surface risk mitigation is expected to be effective due to mine depth and engineered stability and ground control practices. In areas outside the Project boundary where residences are present east of the site fence line, the underground mining depth is anticipated to exceed 3,000 feet, which further reduces the likelihood of surface effects occurring in those areas. Where practicable, siting and layout decisions are used to avoid placing new surface infrastructure

directly over areas of greatest undermining potential. However, because portions of Project surface features may overlie the underground footprint, the primary surface mitigation objective is to prevent personnel and public exposure and to minimize any secondary effects to access corridors, drainage features, and utilities in the unlikely event ground movement is observed. Mitigation will be implemented through a combination of administrative controls (including subsidence modeling, a ground control management plan, and defined action thresholds) and field controls, including: 1) maintaining controlled access measures in areas that may be susceptible to ground movement (e.g., signage, fencing, or other controls as appropriate); 2) periodic surface inspections along access and drainage corridors for cracking, settlement, or changes in drainage behavior; and 3) operational restrictions to prevent vehicle travel or staging in areas showing indicators of instability.

Underground mitigation includes routine geotechnical inspections and monitoring to identify early warning signs such as new cracking, unexpected convergence, changes in ground support performance, abnormal ground conditions in travel ways, or other indicators of instability. As mining approaches the historic mine boundary or other higher-uncertainty zones, mitigation measures may include enhanced verification of boundary conditions using available mapping and targeted investigation methods, along with modified sequencing or additional conservatism in extraction to maintain stability.

2.11.3 Risk Response Measures

If unplanned subsidence is suspected or confirmed (underground or at the surface), the Operator will implement immediate actions to protect personnel and the public, prevent escalation, and evaluate potential secondary impacts. Response actions will be implemented conservatively given that portions of Project surface features (including areas within the tailings facility footprint) and residential areas east of the site fence line may overlie parts of the underground workings. Surface response will focus on exposure control and access management (e.g., restricting access, establishing exclusion zones, and posting notifications as appropriate), together with verification that critical surface features, such as tailings-related earthworks, access routes, drainage controls, and utilities, remain safe and functional. Response actions will prioritize isolating the area, completing appropriate technical evaluation, and implementing corrective measures as needed before resuming activities in or near the affected area.

2.12 Leaks from Containment Systems or Storage or Disposal Facilities (425.205(1)(a)(xii))

This section addresses leaks or threatened leaks from engineered containment systems associated with stockpiles and storage or disposal facilities (e.g., liners, leak detection layers, underdrains and seepage collection systems, berms/curbing, and engineered conveyance features) where a loss of integrity could allow impacted water or materials to migrate to soil, groundwater, or surface water. This category is intentionally focused on containment-system failures (e.g., liner puncture, seam failure, collection system failure, containment overtopping that bypasses containment) rather than on the material-specific consequences of what is being contained. Accordingly, when the material involved is reactive or acid-forming, response actions under this section are implemented in coordination with Section 2.1 (Release or Threat of Release of Toxic or Acid-Forming Materials), and when leaks affect collection/treatment

routing, they are implemented in coordination with Section 2.5 (Wastewater Collection and Treatment System).

2.12.1 Assessment of Risks

Leaks can occur due to liner puncture or tear, seam failure, stress cracking, differential settlement, freeze-thaw effects, damage from equipment traffic, poor subgrade support, clogging or failure of underdrains/collection piping, valve or appurtenance failure, or erosion/overtopping that bypasses intended containment. The primary environmental risk is migration of impacted liquids to soil and groundwater via infiltration or to surface waters via drainage features or preferential pathways. The magnitude and nature of impact depend on the source: leaks from reactive material facilities or contact-water containment can mobilize acidity/metals or elevated suspended solids, while leaks from chemical secondary containment may pose acute toxicity hazards. For this reason, the risk pathway evaluation for leaks is paired with the material-specific risk discussions in Section 2.1 (reactive/acid-forming materials) and Section 2.7 (hazardous substances), as applicable.

Public health and safety risks are typically secondary but can become significant when leaks create unstable ground (softened subgrades, voiding), create slip/ice hazards, or involve hazardous materials with inhalation/corrosivity/reactivity hazards. Operationally, leaks can also reduce usable storage/operating buffer and force curtailment of activities that generate contact water, creating cascading effects into the wastewater collection/treatment contingency category if routing reliability is compromised.

Early indicators of a leak or threatened leak may include unexpected changes in water balance (unexplained loss or increased seepage), wet spots or staining outside lined footprints, turbidity/discoloration in toe drains, abnormal monitoring results at sentinel points (e.g., pH, conductivity), alarms from leak detection systems, erosion at berms/edges, or visible physical damage observed during inspections.

2.12.2 Mitigation of Risks

Mitigation is based on robust containment design, construction QA/QC, operational controls that prevent damage, and monitoring that provides early detection. Engineered containment systems will be designed and constructed to withstand anticipated hydraulic loads, operational traffic, and seasonal conditions, and will include protective layers and access restrictions as needed to reduce puncture and wear. Operational mitigation includes controlling equipment travel and material placement over lined areas, maintaining berms/ditches and conveyance features, and implementing housekeeping practices that prevent debris accumulation or sedimentation that could clog underdrains and collection systems.

Because the consequences of a leak depend strongly on what is being contained, mitigation for reactive material containment and contact-water containment is coordinated with Section 2.1, including measures that reduce driving head and volume (e.g., clean-water diversion, freeboard management, and operational buffers) and measures that keep contact water within engineered collection routes. Similarly, mitigation for leaks involving chemical or hazardous substance containment is coordinated with Section 2.7, including compatibility-based segregation, secondary containment practices, inspection of containment coatings/curbing, and spill preparedness at storage and transfer points.

Monitoring and verification measures include routine inspections of containment perimeters, toe drains and collection sumps, leak detection components (where present), and periodic review of seepage volumes and chemistry trends. Where monitoring indicates deterioration or abnormal trends, the Project will implement trigger-based responses (e.g., increased inspection frequency, operational restrictions, engineered evaluation) before a leak becomes a release.

2.12.3 Risk Response Measures

If a leak or threatened leak is observed or indicated by monitoring, the Operator will immediately implement actions to: 1) protect personnel; 2) prevent escalation and off-site migration; 3) recover and route impacted liquids to controlled management; 4) restore containment integrity; and 5) verify that groundwater and surface waters are protected. Response measures under this section are implemented in parallel with the applicable material/system-specific contingency procedures:

- Section 2.1 when the leak involves potentially reactive ore, waste rock, tailings, or contact water influenced by reactive materials.
- Section 2.3 when the leak involves petroleum fuels/oils and secondary containment at fuel systems.
- Section 2.5 when the leak affects wastewater collection, equalization/storage, routing to treatment, or threatens treatment reliability.
- Section 2.8 when the leak involves hazardous substances or chemical containment.

3. Emergency Notification, Roles, Access Control, Evacuation, and Emergency Equipment (425.205(1)(b))

3.1 Emergency Notification Procedures (425.205(1)(b)(i))

Upon discovery of an emergency condition or credible threat, the on-site Incident Commander (IC) (Mine Manager or highest-ranking designee) will activate the notification process. Notification actions will prioritize life safety and will be made as soon as practicable based on the nature of the incident.

If there is an imminent threat to life, significant injury, fire/explosion hazard, or a condition requiring emergency response assistance, the first notification will be to 911 (or the local emergency dispatch center), followed by internal incident command activation.

If the incident involves, or may involve, a release or potential release of oil, hazardous chemicals, or other materials into the air, land, or water that poses a sudden threat to public health or the environment, the Operator will report the incident to EGLE's PEAS at 800-292-4706. EGLE notes that many incidents reportable to EGLE may also warrant reporting to the federal NRC; when applicable, NRC reporting will be made in parallel. Not all spills or releases constitute environmental emergencies; reporting determinations will be made based on release characteristics, media affected, and threat level, consistent with EGLE guidance.

When off-site impacts are possible, when public access restrictions are needed beyond the facility boundary, or when evacuation/shelter actions could be required, the IC (or Liaison Officer) will notify the applicable County Emergency Management Coordinator(s). Public notification will be coordinated through local emergency management and public safety agencies using established alert systems (e.g., reverse 911/local emergency alerts/media messaging) and supported by the Operator through timely, factual situation updates and technical input.

Minimum information provided in external notifications will include caller name and callback number; incident location; incident type and hazards; actions underway; and recommended protective actions (e.g., avoid area, road closure, shelter-in-place considerations).

3.2 Emergency Contacts, Duties, and Responsibilities (425.205(1)(b)(ii))

The following roles are activated during an emergency. Names, 24/7 phone numbers, and alternates will be inserted upon receipt from the Operator.

- IC – Mine Manager (or designee): overall command; authorizes protective actions; approves external notifications; coordinates with emergency management and regulators.
- Operations Lead – Underground Superintendent/Surface Operations Superintendent: implements tactical response actions; controls operational shutdown/curtailment; manages onsite response teams.
- Health & Safety (H&S) Lead – H&S Superintendent/Manager: establishes exclusion zones; directs evacuation/muster; confirms accountability; coordinates medical response and rescue resources.

- Environmental Lead – Environmental Manager (or designee): evaluates environmental threat; directs containment/mitigation; initiates regulatory notifications (including PEAS) and environmental sampling/verification.
- Maintenance/Utilities Lead – Maintenance Superintendent/Electrical Lead: stabilizes and restores power, ventilation support, pumping, and other critical utilities (including transitions among turbines/grid/diesel generation as applicable).
- Security/Access Control Lead – Security Supervisor (or designee): controls gates and access points; establishes traffic control and perimeter restrictions; maintains entry logs.
- Public Information Officer (PIO)/Liaison Lead – PIO or designated representative: coordinates communications with responding agencies and emergency management; supports public messaging through official channels.

3.3 Restricting Access of Nonessential Personnel (425.205(1)(b)(iii))

Upon activation of emergency response, the IC will direct actions to restrict access to affected areas to protect workers, responders, and the public, and to preserve scene integrity. Access restrictions will be implemented by establishing exclusion zones and controlled entry points using barricades, signage, gate controls, and personnel assigned to access control. Nonessential operations will be suspended as needed, and personnel will report to designated muster locations for accountability. If conditions present a risk beyond the facility boundary (e.g., road hazards, smoke, spill migration), the Operator will coordinate with law enforcement and emergency management for offsite traffic control or public access restrictions.

3.4 Public Evacuation Procedures (425.205(1)(b)(iv))

If evacuation of the public is necessary, the decision to initiate evacuation (or shelter-in-place) will be made in coordination with the Ontonagon County Emergency Management Coordinator and local public safety agencies. The Operator will provide technical input regarding the nature of the hazard, expected travel paths, likely duration, and protective action recommendations. Evacuation operations (routes, shelters, door-to-door notification, traffic routing, checkpoints) will follow the County Emergency Operations Plan and will be implemented by emergency management and law enforcement. The Operator will support evacuation by providing facility maps, hazard zone information, and a liaison at the Incident Command Post.

3.5 Emergency Equipment and Location (425.205(1)(b)(v))

Emergency equipment will be maintained on site in locations that support rapid response to spills, fires, medical incidents, and water management problems. The Operator will maintain an up-to-date inventory list and location map/table identifying emergency equipment caches. The final plan will include the specific equipment list and physical locations once provided by the Operator.

At a minimum, emergency response equipment categories include spill response and containment supplies (absorbents, booms, drain covers, overpacks), fire and life safety equipment (extinguishers, first aid/AEDs, eyewash/shower where applicable), emergency pumping and temporary water control equipment (portable pumps, hoses, berming materials),

and communications/accountability equipment (radios, spare batteries, muster/accountability tools). Underground emergency equipment (e.g., gas monitoring, rescue gear) will be included as applicable to the Project's underground emergency procedures.

3.6 Post-Incident Environmental Verification

Following stabilization of any environmental incident, the Operator will conduct post-incident environmental verification activities as necessary to confirm the effectiveness of response actions and the continued protection of waters of the state. Verification may include targeted inspections, field screening, and confirmatory sampling of affected or potentially affected media (e.g., surface water, contact water, soils, or containment systems), consistent with the nature and extent of the incident. The scope and location of verification activities will be based on site conditions, release characteristics, and professional judgment, and may be adjusted in coordination with EGLE as appropriate. Results will be documented and used to confirm that corrective actions were effective and that no residual impacts requiring additional mitigation remain.

4. Emergency Telephone Numbers (425.205(1)(c))

Table 4-1 provides the emergency telephone numbers required under R 425.205(1)(c) and is intended to serve as the primary consolidated contact reference for emergency response and notification.

- Representatives of the operator (205 (1)(c)(i))
- The emergency management coordinator (205 (1)(c)(ii))
- Local ambulance services (205 (1)(c)(iii))
- Local hospitals (205 (1)(c)(iv))
- Local fire and police departments (205 (1)(c)(v))
- The department of environmental quality (205 (1)(c)(vi))
- Pollution emergency alerting system (205 (1)(c)(vii))
- Federal regulatory agencies as appropriate (205 (1)(c)(viii))
- The department of natural resources (205 (1)(c)(ix))
- The local unit of government (205 (1)(c)(x))

5. Contingency Plan Testing (425.205(1)(d))

During each calendar year, the facility will assess the effectiveness of this Contingency Plan to ensure that emergency procedures, notifications, roles, and response resources function as intended and that personnel remain prepared to implement the plan under realistic conditions. Testing will be structured as a two-part program: 1) training and role-based preparedness; and 2) an exercise program that includes periodic call-down testing and at least one annual desktop/tabletop or field exercise, selected based on the scenario being evaluated and operational constraints.

5.1 Training and Role-Based Preparedness

Training will be provided to personnel who may have emergency responsibilities, including (at a minimum) the IC, H&S Lead, Environmental Lead, Public Relations Lead, and other personnel designated to support emergency response, fire response, and mine rescue functions. Training will be commensurate with assigned duties and will include, as applicable, emergency communications and notification procedures, site access control, initial response actions, hazard recognition, and the proper selection and use of emergency response equipment. Training will also address coordination requirements with external responders and agencies, including the process for contacting emergency services and for reporting environmental emergencies.

Training activities will be documented (date, topic, attendees, and trainer/qualifications) and maintained with the Contingency Plan records. Refresher training will be provided when roles change, when there are substantive changes to site conditions or emergency equipment, or when lessons learned from an incident or exercise indicate a need for improvement.

Contractors performing work with spill, fire, blasting, or water-management risk will receive appropriate site-specific emergency orientation and will be required to comply with this Contingency Plan.

5.2 Exercises and Field Tests

The second component of plan testing will be an exercise program designed to validate communications, decision-making, and field implementation under simulated emergency conditions. Call-down tests (i.e., a phone-tree) will be conducted periodically to confirm notification pathways, contact information, and role assignments, and at least one exercise will be conducted annually as either a desktop/tabletop exercise or a field exercise to evaluate overall readiness. Desktop exercises may be used for scenarios that are difficult to simulate physically, while field exercises may be used to validate on-site deployment, access control, and coordination of response resources.

The H&S Lead, in coordination with the Environmental Lead and the IC, will select and define the annual exercise scenario(s), establish objectives, and schedule the exercise date and time. Exercise scenarios will be selected from credible events addressed in this Contingency Plan and may include, for example: response to a hazardous substance spill; response to a fire (surface or underground); response to a failure or threatened failure of an impoundment/embankment; response to a power disruption affecting critical systems; or response to severe weather impacts requiring access control and emergency coordination.

Each exercise will be conducted against a written Exercise Plan that defines: 1) the simulated initiating event and assumptions; 2) the specific objectives to be evaluated; 3) the participating roles and agencies; 4) the performance criteria used to assess effectiveness; and 5) safety controls for conducting the exercise. Local emergency response officials and the applicable County Emergency Management Coordinator(s) may be invited to participate when the selected scenario involves off-site coordination, public protective actions, or responder interface, and the facility will coordinate exercise logistics to avoid disruption to public services.

5.3 Evaluation, Corrective Actions, and Documentation

Following each exercise, the facility will complete an After-Action Review documenting what occurred, whether objectives were met, observed strengths, gaps, and recommended corrective actions. Corrective actions will be assigned to a responsible person, assigned a due date, and tracked to closure. The Contingency Plan will be updated as necessary to reflect improvements identified during exercises or actual incidents, including updates to notification processes, roles/responsibilities, and emergency equipment lists/locations.

6. Contingency Plan Submissions (425.205(2))

WPC shall submit a copy of the Contingency Plan to each Local Emergency Management Coordinator having jurisdiction over the Project Area. Updates to the plan will be provided as needed.

7. References

Foth Infrastructure & Environment, LLC, 2026a. Mine Permit Application. July 2026.

Foth Infrastructure & Environment, LLC, 2026b. Environmental Impact Assessment. July 2026.

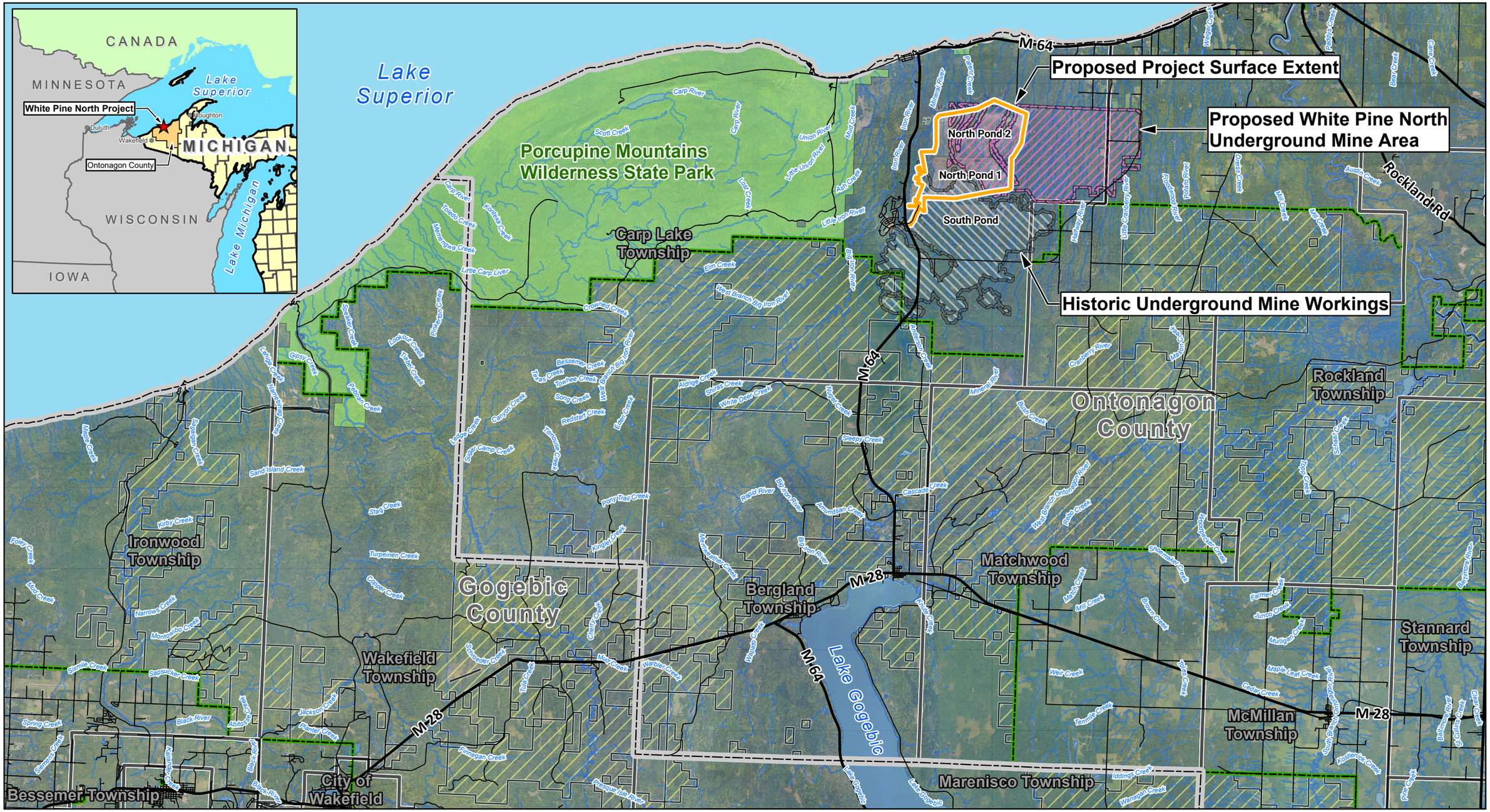
Table

Table 4-1
Emergency Telephone Numbers

Contact	Description	Emergency Phone Number	Non-Emergency Phone Number
Representatives of the Operator	*To be completed by the permittee*		
Emergency Management Coordinator	Ontonagon County Sheriff's Office	911	(906) 884-4901
Local Ambulance Services	Ontonagon County Emergency Medical Services	911	(906) 884-4901
Local Clinic	Aspirus Ontonagon Clinic	911	(906) 884-8240
Local Hospital	Aspirus Ironwood Hospital	911	(906) 932-2525
Local Fire Department	Carp Lake Township Fire Department	911	(906) 885-5230
Local Police Department	Ontonagon County Sheriff's Office	911	(906) 884-4901
Department of Environment, Great Lakes, and Energy	EGLE Environmental Assistance Center	(800) 662-9278	
Pollution Emergency Alerting System	PEAS 24-Hour Environmental Emergency Hotline	(800) 292-4706	
National Response Center	Federal spill and release reporting	(800) 424-8802	
Michigan Department of Natural Resources	General assistance	(517) 284-6367	
Local Unit of Government	Carp Lake Township	(906) 885-5884	

Prepared by: MJG4
Checked by: CER2

Figures



NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.

LEGEND

- Major Road
- Minor Road
- River/Stream
- Lake/Pond
- Proposed Project Surface Extent
- Proposed White Pine North Underground Mine Area
- Historic Underground Mine Workings
- Municipal Boundary
- County Boundary
- Ottawa National Forest Boundary
- Porcupine Mountains Wilderness State Park
- USDA Forest Service Owned Property

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Foth Infrastructure & Environment, LLC			
REVISED	DATE	BY	DESCRIPTION
PREPARED BY:		DATE:	
REVIEWED BY:		DATE:	
APPROVED BY:		DATE:	

WHITE PINE COPPER LLC

FIGURE 1-1
PROJECT LOCATION MAP
CONTINGENCY PLAN
WHITE PINE NORTH, ONTONAGON COUNTY, MI

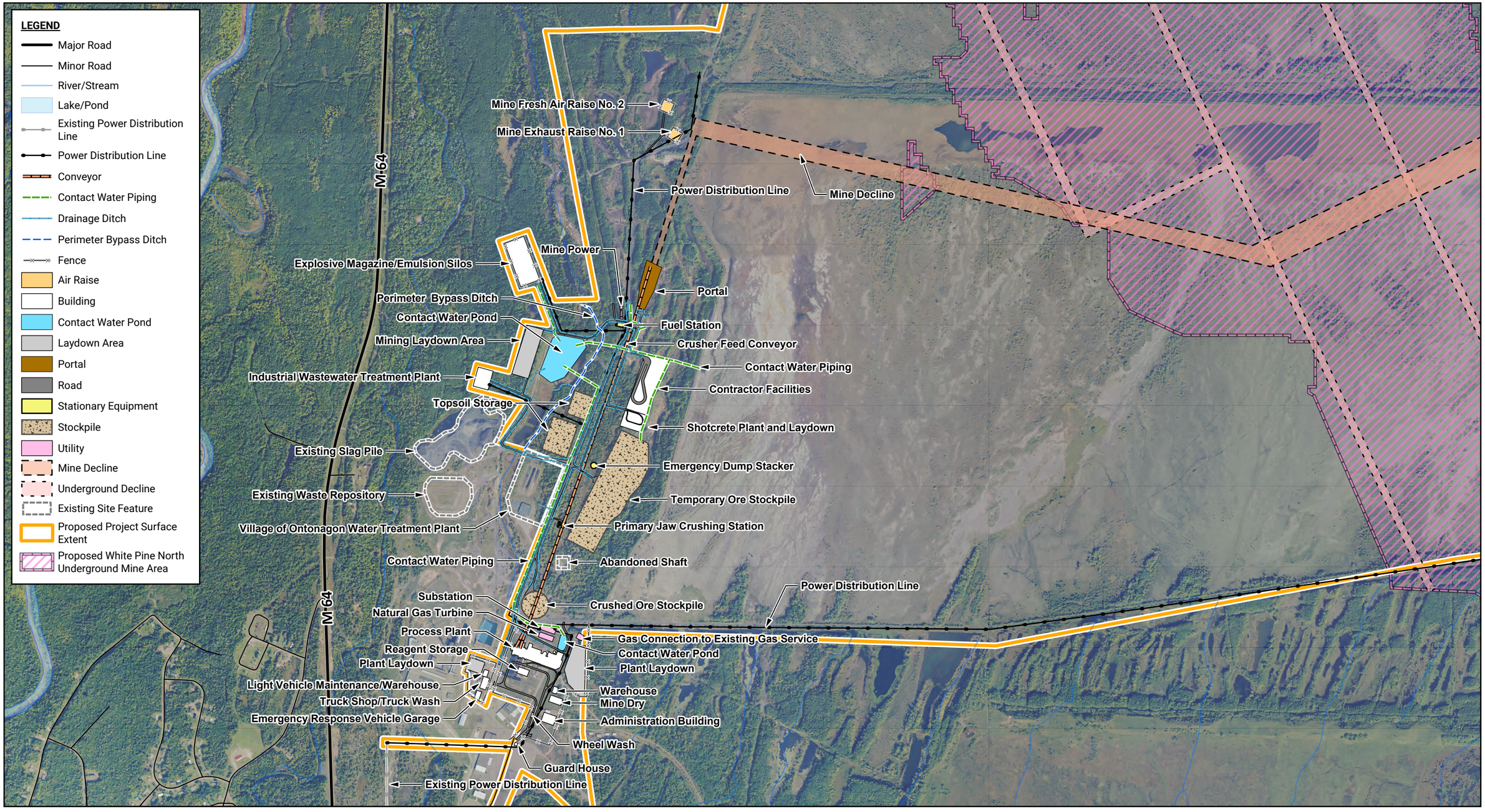
Scale: 0 1.5 3 Miles

Date: MAY 2026

Drafted By: BJW1

Project: 25W006

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NOTES:

1. 2024 - 18in resolution air photo from the USDA NAIP.
2. Horizontal coordinate system is NAD1983 UTM Zone, 16N, units in meters.
3. Road, boundary and hydrographic data from Michigan GIS Open Data.
4. Site layout and infrastructure data from Ausenco, March 2026.

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Foth Infrastructure & Environment, LLC			
REVISED	DATE	BY	DESCRIPTION
PREPARED BY:			DATE:
REVIEWED BY:			DATE:
APPROVED BY:			DATE:

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FIGURE 1-2
PROPOSED MINE SITE LAYOUT
CONTINGENCY PLAN
WHITE PINE NORTH, ONTONAGON COUNTY, MI

Scale: 0 600 1,200 Feet

Date: JUNE 2026

Drafted By: DAT

Project: 25W006

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Appendix I

Financial Assurance and Closure Plan Estimate

Report

Financial Assurance and Closure Plan Estimate

White Pine North Project



White Pine Copper LLC

White Pine, Michigan

April 2026

Project ID: 25W005

Solving our clients' toughest science and engineering challenges.

Financial Assurance and Closure Plan Estimate
White Pine North Project

Project ID: 25W005

Prepared for
White Pine Copper LLC
White Pine, Michigan

Prepared by
Foth Infrastructure & Environment, LLC

April 2026

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Financial Assurance and Closure Plan Estimate
White Pine North Project

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Table 1 Financial Assurance including Salvage Summary
Table 2 Financial Assurance and Salvage Breakdown

List of Abbreviations, Acronyms, and Symbols

CPI	Consumer Price Index
EGLE	Michigan Department of Environment, Great Lakes, and Energy
FA	Financial Assurance
Foth	Foth Infrastructure & Environment, LLC
LOM	Life of Mine
NP1	North Pond 1
QA/QC	quality assurance/quality control
TSF	Tailings Storage Facility
WPC	White Pine Copper LLC

1. Introduction

White Pine Copper LLC (WPC) is a wholly owned subsidiary of Kinterra Copper USA LLC. WPC is seeking to develop the brownfield site of the previous White Pine Mine located approximately 3 miles south of Lake Superior, east of M-64, in Carp Lake Township, Ontonagon County, Michigan. Pursuant to Michigan Rules, Part 632, Part 3, WPC shall provide financial assurance (FA) to cover the White Pine North Project reclamation, remediation, and post-closure monitoring costs as part of mining activities conducted under the permit to mine.

This Financial Assurance and Closure Plan Estimate has been prepared in accordance with Part 632: Nonferrous Metallic Mineral Mining of the Natural Resources and Environmental Protection Act, 1994 PA 451, and the Part 632 Administrative Rules. It describes:

- Financial assurance sufficient for the state to hire a third party to complete all required reclamation, remediation, and post-closure monitoring.
- The technical approach for reclamation and closure of mining, tailings, site infrastructure, post-closure water treatment, and long-term monitoring.

The financial assurance calculations will be updated per permit conditions and every three years as required under R 425.308(1).

2. Financial Assurance Requirements

Pursuant to R 425.301, FA shall be sufficient to administer and hire a third party to complete all remaining reclamation, required remediation, and post-closure monitoring in compliance with Part 632, the rules, and permit conditions. FA must remain in place through post-closure until released by the Michigan Department of Environment, Great Lakes, and Energy (EGLE); updates must follow R 425.308(2)(a), using the Detroit consumer price index and a three-year re-estimation cycle. Acceptable instruments include surety bond, irrevocable letter of credit, trust fund/escrow, certificate of deposit, or a statement of financial responsibility, as approved by EGLE. For purposes of this report, three separate financial assurance periods are defined:

- End of Construction
- Year 10
- Life of Mine (LOM)

2.1 End of Construction Financial Assurance Period

End of Construction FA period covers remaining earthworks, initial demolition areas, temporary stormwater best management practices, portal and raise safety measures, and any partial Tailings Storage Facility (TSF) closure works started during construction. FA at this stage must also be sufficient to place the site into a safe and stable condition if mining does not proceed.

The basis of estimation uses third-party contractor unit rates, engineer/construction management oversight, mobilization, permit-required environmental protection, and monitoring/inspection. Apply a conservative contingency to reflect early-stage quantity uncertainty.

2.2 Year 10 Financial Assurance Period

The Year 10 FA period reflects mid-life operations with progressive reclamation completed to date, partial or full utilization of TSF North Pond 1 (NP1), and updated quantities for remaining mining closure, NP1 cover and decant/discharge works, retired surface infrastructure, and a matured monitoring network.

The third-party cost estimate will be recalculated for all remaining closure obligations and adjusted for inflation using the Detroit Consumer Price Index (CPI). Financial assurance will be reduced only for reclamation work that has been physically completed and formally accepted by EGLE.

2.3 Life of Mine Financial Assurance Period

LOM FA period encompasses full utilization of TSF North Pond 2, any additions or upgrades to the post-closure water treatment plant, remaining underground closure works (plugs, bulkheads, controlled rapid reflooding), process plant demolition, liner removals, permanent stormwater modifications, and long-term monitoring.

The third-party completion cost estimate will be recalculated on a triennial basis through closure, with annual CPI checks to confirm that the FA amount remains current. FA will be sized to peak during active closure and to cover at least five years of post-closure monitoring, or the longer duration specified by the mining permit.

3. Closure and Reclamation

3.1 Underground Mine

Closure will remove all noninert infrastructure and hazardous materials from the workings, followed by construction of a surface portal plug and ventilation-raise bulkheads at hydrostratigraphically beneficial locations to isolate openings and control gradients. After deenergizing and extracting mechanical and electrical equipment, the mine will undergo controlled rapid reflooding to reestablish a stable hydraulic condition, with plugs and bulkheads designed to withstand long-term head and minimize pathways to shallow aquifers.

3.2 Surface Facilities

Processing and support infrastructure will be deenergized, salvaged where practicable, and demolished to final grade; utilities and stormwater systems (liners, pumps, piping, ponds) will be removed or abandoned in place to specification, followed by backfilling, recontouring to stable slopes, topsoiling, and reseeding with region-appropriate mixes to achieve erosion control and final land use. Where a post-closure water treatment period is required, treatment will operate for the defined duration and internal equipment will be removed at completion, after which stormwater systems will transition to passive long-term management as needed.

3.3 Tailings Storage Facilities

Tailings delivery and reclaim piping will be removed or properly decommissioned, and landforms will be graded to promote positive drainage and long-term stability, then vegetated to meet cover performance criteria and reduce erosion. Embankment upgrades, drainage features, or outlet structure improvements will be implemented if required by dam safety evaluations, and the facility will enter a long-term monitoring and inspection program to verify ongoing stability and performance.

3.4 Post-Closure Monitoring

3.4.1 Surface Water Monitoring

Surface water monitoring includes a network of approximately 25 locations sampled over about 60 monitoring events across 20 years. Each event records field parameters and stage/flow where applicable, collects samples for laboratory analysis, and measures surface water levels to support mass loading and trend evaluations. Analytical suites emphasize constituents relevant to mine-related pathways (e.g., major ions, metals, nutrients, total suspended solids, alkalinity, pH, and conductivity), with quality assurance/quality control (QA/QC) procedures, chain-of-custody, and data validation applied to each round. Select stations may be equipped with staff gages or pressure transducers to develop stage-discharge relationships and to strengthen seasonal and stormflow interpretations. Results are compiled in an annual data report with trend graphics and comparisons to site-specific performance objectives; exceedance and trend triggers inform adaptive management actions or confirm readiness for frequency reduction.

3.4.2 Groundwater Monitoring

Groundwater monitoring comprises approximately 25 wells sampled over about 60 monitoring events during the 20-year period. Each event includes water-level measurement prior to sampling to define potentiometric surfaces and gradients, followed by low-flow purging and

sample collection. Analytical programs mirror surface water priorities to enable source-pathway-receptor linkage and mass-balance comparisons. Routine well maintenance (e.g., redevelopment as needed) preserves sample integrity, and all activities follow documented Standard Operating Procedures and QA/QC requirements. Groundwater heads and chemistry are evaluated against performance criteria and historical baselines; decision points support transition from quarterly/annual intervals to reduced frequency as stability is demonstrated.

3.4.3 Biological Monitoring

Biological monitoring consists of two to three events per year for five years, coordinated with hydrologic conditions to capture spring, summer, and fall community responses. Surveys include qualitative assessments of aquatic communities and habitat at representative upstream reference and downstream exposure reaches, using consistent seasonal index periods and methods to enable trend detection. Biological data are paired with concurrent surface water chemistry and flow information to evaluate designated-use protection, detect potential stressors, and confirm the effectiveness of physical reclamation measures.

4. Statement of Financial Responsibility

A statement of financial responsibility to meet the requirements listed under R425.307 will be issued by White Pine Copper when such requirements have been agreed upon with EGLE.

5. Financial Assurance Cost Estimating

This estimate sets the financial assurance required to enable the state to administer and hire a third party to complete all remaining reclamation, any required environmental protection measures, and post-closure monitoring through permit release, consistent with Part 632 requirements. The estimate covers mining, tailings, site infrastructure, post-closure water treatment, and long-term monitoring.

Summary cost tables by work package (mining, TSF, site infrastructure, post-closure water management, and long-term monitoring) are found in Table 1. Detailed cost tables by work package can be found in Table 2. The estimated financial assurance costs for the three time periods are:

Financial Assurance and Salvage Summary

	End of Construction Cost	Year 10 Cost	Life of Mine Cost
Subtotal	*$46,865,852*	*$93,253,876*	*$121,233,741*
Agency Costs	*$4,686,585*	*$9,325,388*	*$12,123,374*
Financial Assurance Total	**$51,552,437**	**$102,579,264**	**$133,357,115**
Salvage	$(203,124,498)	$(126,316,947)	$(92,494,117)
Total incl. Salvage	$(151,572,061)	$(23,737,683)	$40,862,998

5.1 Estimation Methodology

- Quantities are derived from closure drawings and specifications; unit rates come from current contractor handbooks/bids. The estimate includes mobilization/demobilization, contractor overhead and profit, and engineer/construction manager oversight, plus permit-required environmental controls and inspection/monitoring.
- Indirect costs and contingencies: Allowances are included for permits/fees, surveys and QA/QC, construction controls, winterization, and a risk-based contingency commensurate with design maturity and quantity uncertainty.

5.2 Key Planning Assumptions

- Costs are expressed in 2026 dollars without embedded escalation in unit rates.
- Post-closure water treatment is assumed to operate for five years after closure; internal-equipment decommissioning follows treatment cessation.
- Buildings and structures are assumed to be reclaimed within five years post-closure.
- No remediation actions are currently anticipated or included; if required by permit conditions or monitoring, FA will be adjusted accordingly.
- Post-closure monitoring (groundwater and surface water) is assumed for 20 years following closure; frequency reductions are incorporated in the monitoring plan.
- Unit costs for reclamation and post-closure monitoring reflect current industry practice and recent benchmarking for similar Upper Midwest projects.

Tables

Table 1
Financial Assurance including Salvage Summary
White Pine North

Area - Activity	End of Construction Cost	Year 10 Cost	Life of Mine Cost	Comment
Mine Site - Demolition	$ 1,364,000	$ 1,364,000	$ 1,364,000	Demolition and removal of mine-site surface structures and foundations, including site clearing and disposal of demolition debris.
Mine Site - Equipment Removal	$ 9,948,365	$ 16,295,006	$ 21,537,495	De-energizing, disconnecting, rigging, and removing mine-site mechanical/electrical equipment and appurtenances; preparation for transport, recycling, or disposal.
Mine Site - Reclamation	$ -	$ 6,916,022	$ 7,013,396	Closure actions to stabilize the mine site following cessation of operations, including measures to support safe conditions and long-term stability (e.g., reflooding and associated site controls).
Post-Closure - Long-term Monitoring	$ -	$ 8,500,000	$ 8,500,000	Long-term post-closure monitoring program implementation, including field measurements, sampling, laboratory analysis, reporting, and data evaluation for compliance and trend performance.
Site Infrastructure - Other - Disposal	$ 942,500	$ 942,500	$ 942,500	Characterization, packaging, transport, and disposal of non-routine wastes (e.g., hazardous materials, chemicals, residuals, and impacted solids) not covered under other demolition categories.
Site Infrastructure - Processing Facility - Demolition	$ 10,349,665	$ 10,349,665	$ 10,349,665	Demolition of processing facility structures (buildings, slabs, foundations) and associated removal/handling of demolition debris.
Site Infrastructure - Processing Facility - Reclamation	$ 1,473,200	$ 1,473,200	$ 1,473,200	Final grading, surface restoration, erosion control, topsoiling, and revegetation of processing and adjacent disturbed areas after demolition.
Site Infrastructure - Stormwater - Equipment Removal	$ 342,761	$ 1,102,613	$ 1,319,171	Decommissioning and removal of stormwater mechanical systems and components (pumps, controls, piping, and appurtenances) and associated utility disconnects.
Site Infrastructure - Stormwater - Long-term Management	$ 173,513	$ 173,513	$ 173,513	Construction/implementation of permanent stormwater controls needed after closure (passive conveyance, treatment, or stabilization features) and associated long-term O&M provisions.
Site Infrastructure - Stormwater - Reclamation	$ 323,702	$ 323,702	$ 415,957	Removal or closure of stormwater features where required, followed by regrading, stabilization, and revegetation of affected areas to achieve long-term erosion control.
Site Infrastructure - Stormwater - Short-term Managemen	$ 173,513	$ 173,513	$ 173,513	Temporary best management practices and active inspection/maintenance during demolition and earthworks to control sediment, turbidity, and runoff until final stabilization is achieved.
Site Infrastructure - Utilities - Demolition	$ 399,765	$ 399,765	$ 399,765	Demolition and removal of utility-related surface structures (pads, vaults, small buildings), and restoration of disturbed areas.
Site Infrastructure - Utilities - Equipment Removal	$ 725,000	$ 725,000	$ 725,000	De-energizing, isolating, and removing utility equipment and materials (power distribution components, piping, conduit, controls) and securing remaining subsurface elements as appropriate.
Surface Facilities - Demolition	$ 417,550	$ 417,550	$ 417,550	Demolition of surface facility structures and pads not included in the processing facility category; includes debris handling and site clearing.
Surface Facilities - Disposal	$ 6,660,626	$ 6,660,626	$ 6,660,626	Off-site disposal of demolition debris and non-hazardous waste streams generated during closure activities, including tipping fees and hauling/disposal logistics.
Surface Facilities - Equipment Removal	$ 7,250,000	$ 7,250,000	$ 7,250,000	Removal and disposition of non-process surface equipment (pumps, tanks, compressors, HVAC, electrical gear) including disconnects and rigging.
Surface Facilities - Reclamation	$ 1,015,000	$ 1,015,000	$ 1,015,000	Site restoration after surface facility removal, including recontouring to stable landforms, erosion control, topsoil placement, and revegetation.
Tailings Storage Facility - Equipment Removal	$ 121,092	$ 121,092	$ 363,285	Decommissioning/removal of TSF operational equipment and conveyance components (pipelines, pumps, valves, controls) and securing the system for long-term closure.
Tailings Storage Facility - Monitoring	$ -	$ 750,000	$ 750,000	Long-term dam safety monitoring and inspection program, including instrumentation reads, routine site inspections, and periodic professional engineering inspections.
Tailings Storage Facility - Reclamation	$ -	$ 2,463,360	$ 6,558,505	Final Tailings Storage Facility closure earthworks, including regrading/contouring, surface drainage controls, cover placement as applicable, and revegetation to achieve long-term stability and erosion control.
Water Treatment Plant - Equipment Removal	$ 5,185,600	$ 5,185,600	$ 5,185,600	Decommissioning and removal of internal WTP mechanical/electrical equipment and appurtenances after treatment is no longer required; cleaning, disconnection, and disposal/recycling as appropriate.
Water Treatment Plant - Post-closure Treatment	$ -	$ 20,652,150	$ 38,646,000	Operating post-closure water treatment for the defined duration, including utilities, reagents, residuals handling/disposal, compliance sampling, and performance reporting until closure criteria are met.
Subtotal	*$ 46,865,852*	*$ 93,253,876*	*$ 121,233,741*	Sum of direct scope items listed above prior to contingency.
Agency Costs	*$ 4,686,585*	*$ 9,325,388*	*$ 12,123,374*	Allowance for quantity uncertainty, access constraints, weather impacts, and execution risk typical of closure work at this design stage.
Financial Assurance Total	**$ 51,552,437**	**$ 102,579,264**	**$ 133,357,115**	Total third-party completion amount intended to support bonding for the specified time period, including contingency.
Salvage	$ (203,124,498)	$ (126,316,947)	$ (92,494,117)	Aggregate gross salvage potential across categories at the specified time frames, reflecting the portion of installed assets expected to remain recoverable at each stage given progressive demolition and equipment retirement.
Total incl. Salvage	$ (151,572,061)	$ (23,737,683)	$ 40,862,998	Financial Assurance Total after Salvagable Materials Sold

Prepared by: MJG4
Checked by: KB

Table 2
Financial Assurance and Salvage Breakdown
White Pine North

Area	Category	Description	EOC Salvage Rate	Y10 Salvage Rate	LOM Salvage Rate	EOC Quantity	Y10 Quantity	LOM Quantity	Units	Unit Cost (USD)	EOC Cost	Y10 Cost	LOM Cost	Comment
Mine Site	Demolition	Batch Plant	$ 1,484,100.00	$ 873,000.00	$ 349,200.00	0.3333	0.3333	0.3333	dollars	$ 2,700,270.03	$ 900,000	$ 900,000	$ 900,000	30% of the capital cost of constructing the batch plant, less equipment, salvage value at Year 1 is 85% of the purchase price, 50% after 10 years and 20% at the end of the mine life.
	Demolition	Surface Magazine	$ -	$ -	$ -						$ 204,000	$ 204,000	$ 204,000	30% of the capital cost of constructing the surface explosives magazine.
	Demolition	Surface Portal Plug	$ -	$ -	$ -						$ 260,000	$ 260,000	$ 260,000	Allowance equivalent to the cost of constructing the bulkhead for the underground intake fan station.
	Equipment Removal	Bulk Materials (pipe and pipe fittings, electrical cable and steel)	$ 2,088,891.26	$ 3,133,336.89	$ 4,177,782.52						$ 8,240,576	$ 12,360,864	$ 16,481,152	Removal cost equals $10/meter of large electrical cable and large diameter pipe, $5/meter for small electrical cable and small diameter pipe, 40% of installation cost for steel. Quantities of pipe assumed to be 50% of project total x 50% recoverable in year 1, 75% x 50% recoverable at Year 10 and 100% x 50% recoverable at end of mine life. Salvage value estimated at 5% of procurement value and materials sold as scrap. Underground pipe, pipe fittings, and steel considered inert and left in place.
	Equipment Removal	Decline Bulkhead	$ -	$ -	$ -						$ 195,000	$ 195,000	$ 195,000	If it is not a requirement to remove the portal canopy, assume a decline bulkhead is built at the canopy entrance with a structural bulkhead built further down the decline where excavation begins. Estimate is 75% of the cost of constructing the Intake fan station bulkhead.
	Equipment Removal	Electrical Equipment	$ 6,908,000.00	$ 7,319,860.00	$ 3,255,416.00						$ 182,188	$ 368,717	$ 421,598	Includes MLCs, swtichgear, VFDs, networks panels, PLCs, etc. Removal cost equals 40% of electrical equipment installation cost. Salvage value is 80% of procurement cost at end of construction, 50% at year 10 and 20% at LOM closure. End of construction set at start of PY 1 (end of CAPEX).
	Equipment Removal	Mechanical Equipment	$ 12,787,268.26	$ 19,060,245.67	$ 10,640,029.27						$ 947,660	$ 2,771,185	$ 3,904,505	Includes conveyors, grizzlies, vibratory feeders, pumps, fans, cranes, refuge chambers, etc. Removal cost equals 40% of mechanical installation cost. Salvage value is 80% of procurement cost at end of construction, 50% at Year 10 and 20% at LOM closure. End of construction set at start of PY 1 (end of CAPEX).
	Equipment Removal	Mobile Equipment - Production and Development	$ 42,854,956.00	$ 50,029,555.10	$ 49,288,811.85						$ 125,000	$ 192,500	$ 137,500	Removal cost equals $2,500 per unit x number of units required in years 1, 10 and end of life (from rebuild-replace schedule). Salvage value is scaled based on the cumulative operating hours by unit (from rebuild-replace schedule), typicall 90% of purchase price for 1,000 operating hours, 60% for operating hours approaching major rebuild and 20% for units nearing replacement. Each unit adjusted individually to account for the full fleet, either operational of on standby.
	Equipment Removal	Mobile Equipment - Support	$ 5,710,785.12	$ 5,259,288.24	$ 4,356,441.72						$ 43,000	$ 56,000	$ 47,000	Removal cost equals $1,000 per unit x number of units required in Years 1, 10 and end of mine life (from rebuild replace schedule, many are cassettes). Salvage value equals 90% of purchase price per unit in year 1 and 60% of the purchase price in Year 10 and at end of mine life.
	Equipment Removal	Ventilation Raise - Bulkhead	$ -	$ -	$ -						$ 184,941	$ 313,239	$ 313,239	30% of the cost of the overburden excavation and lining installation for the surface boreholes constructed by year 1, year 10 and end of mine life.
	Equipment Removal	Ventilation Raise - Mechanical Equipment	$ 3,120,992.00	$ 2,535,806.00	$ 1,014,322.40						$ 30,000	$ 37,500	$ 37,500	Removal cost equals 40% of mechanical installation cost. Salvage value is 80% of procurement cost at end of construction, 50% at year 10 and 20% at LOM closure. End of construction set at start of PY 1 (end of CAPEX).
	Reclamation	Rapid Reflooding Equipment	$ -	$ 336,350.00	$ 336,350.00			9000.00	lin. Ft.	$ 700.00	$ -	$ 6,727,000	$ 6,727,000	Cost of 9000 feet of 36-inch buried steel water pipe approximatley $700/ft, cost of 6000gpm, 100ft head pump approximatley $400k. $3/ft removal cost Salvage value estimated at 5% of procurement value and materials sold as scrap.
	Reclamation	Rapid Reflooding Pumping	$ -	$ -	$ -	0.00	8823656.27	13369176	1000 gallons	$ 0.08	$ -	$ 807,893	$ 1,224,334	Assuming on-peak rate of 0.07493 and off-peak of 0.04871 USD/kWh and 375kW to supply 18000gpm pump to fill 50607837m3 (13,369,176,166,000gallons) plus $300/month fees.
Post-Closure	Long-term Monitoring	Biological Monitoring	$ -	$ -	$ -	0.00	5.00	5.00	years	$ 100,000.00	$ -	$ 500,000	$ 500,000	Assumes 3 events per year for 5 years and any equipment rentals and incidentals.
	Long-term Monitoring	Groundwater Monitoring	$ -	$ -	$ -	0.00	20.00	20.00	years	$ 200,000.00	$ -	$ 4,000,000	$ 4,000,000	Assumes 60 sampling events over 20 years at $1,300/sample at 25 monitoring locations plus labor and equipment rental.
	Long-term Monitoring	Surface Water Monitoring	$ -	$ -	$ -	0.00	20.00	20.00	years	$ 200,000.00	$ -	$ 4,000,000	$ 4,000,000	Assumes 60 sampling events over 20 years at $1,300/sample at 25 monitoring locations plus labor and equipment rental.
Site Infrastructure - Other	Disposal	Characterize soil surface conditions – Phase I ESA across the site, including fuel storage locations and roadways	$ -	$ -	$ -						$ 290,000	$ 290,000	$ 290,000	
	Disposal	Chemical Removal	$ -	$ -	$ -						$ 362,500	$ 362,500	$ 362,500	Allowance to remove chemicals, lubricants, fuels, explosives, wastes, etc.
	Disposal	Dispose of all hazardous chemicals and reagents	$ -	$ -	$ -						$ 290,000	$ 290,000	$ 290,000	
Site Infrastructure - Processing Facility	Demolition	Concentrate Handling	$ -	$ -	*						$ 478,500	$ 478,500	$ 478,500	
	Demolition	Concrete Demolition	$ -	$ -	$ -	10488.00	10488.00	10488.00	m^3	$ 72.50	$ 760,380	$ 760,380	$ 760,380	
	Demolition	Crushing	$ -	$ -	*						$ 333,500	$ 333,500	$ 333,500	
	Demolition	Flotation and Regrind	$ -	$ -	*						$ 2,711,500	$ 2,711,500	$ 2,711,500	
	Demolition	Grinding	$ -	$ -	*						$ 4,219,500	$ 4,219,500	$ 4,219,500	
	Demolition	Process Plant Building	$ 30,000,000.00	$ 10,000,000.00	$ 2,500,000.00						$ 290,000	$ 290,000	$ 290,000	
	Demolition	Process Plant Services and Common	$ -	$ -	*						$ 261,000	$ 261,000	$ 261,000	
	Demolition	Reagents	$ -	$ -	*						$ 72,500	$ 72,500	$ 72,500	
	Demolition	Structural Steel Demolition	$ -	$ -	$ -	843.30	843.30	843.30	t	$ 1,450.00	$ 1,222,785	$ 1,222,785	$ 1,222,785	
	Reclamation	Mill and Plant Area (Grading/contouring/scarification/organics/revegetation)	$ -	$ -	$ -	14.30	14.30	14.30	acre	$ 29,000.00	$ 414,700	$ 414,700	$ 414,700	
	Reclamation	ROM Ore Stockpile and Reclaim	$ -	$ -	*						$ 1,058,500	$ 1,058,500	$ 1,058,500	

Table 2 (continued)

Area	Category	Description	EOC Salvage Rate	Y10 Salvage Rate	LOM Salvage Rate	EOC Quantity	Y10 Quantity	LOM Quantity	Units	Unit Cost (USD)	EOC Cost	Y10 Cost	LOM Cost	Comment
Site Infrastructure - Stormwater	Equipment Removal	Backfill Stormwater Sumps	$ -	$ -	$ -	13332.47	13332.47	13332.47	yd^3	$ 9.26	$ 123,515	$ 123,515	$ 123,515	Backfill stormwater sumps.
	Equipment Removal	Excavate 1-ft Surface Material, Haul to Local Disposal Location, and Spread	$ -	$ -	$ -	84637.96	84637.96	84637.96	yd^3	$ 5.37		$ 354,001	$ 454,891	Excavate 1-ft surface material, haul to local disposal location, and spread.
	Equipment Removal	Furnish and Install 18" Cover Soil and 6" Topsoil	$ -	$ -	$ -	245549.17	245549.17	245549.17	ft^2	$ 1.80		$ 343,904	$ 441,917	Furnish and install 18" cover soil and 6" topsoil.
	Equipment Removal	Remove HDPE Liner, Haul to Off-Site Recycle or Landfill, Add Disposal Fee	$ -	$ -	$ -	243716.00	243716.00	243716.00	ft^2	$ 0.26	$ 64,449	$ 64,449	$ 64,449	Remove HDPE liner, haul to off-site recycle or landfill, add disposal fee.
	Equipment Removal	Remove Pond and Sump Sludge, Solidify, Haul to Local Disposal Location, and Spread	$ -	$ -	$ -	12612.35	12612.35	12612.35	yd^3	$ 6.31		$ 61,947	$ 79,601	Remove pond and sump sludge, solidify, haul to local disposal location, and spread.
	Equipment Removal	Storm Water Mgmnt. Piping and Pumps	$ -	$ -	$ -	5000.00	5000.00	5000.00	lin.ft.	$ 30.96	$ 154,798	$ 154,798	$ 154,798	Stormwater management piping and pumps.
	Long-term Management	Long-term stormwater drainages/controls assumed at 5% of post-closure stormwater costs.	$ -	$ -	$ -	1.00	1.00	1.00	LS	10%	$ 173,513	$ 173,513	$ 173,513	Long-term stormwater drainages/controls assumed at 5% of post-closure stormwater costs.
	Reclamation	Furnish and Install Seed, Fertilizer and Mulch	$ -	$ -	$ -	52.46	52.46	52.46	acres	$ 4,754.10	$ 194,091	$ 194,091	$ 249,407	Furnish and install seed, fertilizer, and mulch.
	Reclamation	Site Grading	$ -	$ -	$ -	52.46	52.46	52.46	acres	$ 3,174.71	$ 129,611	$ 129,611	$ 166,550	Site grading.
	Short-term Management	General stormwater controls during reclamation	$ -	$ -	$ -	1.00	1.00	1.00	LS	10%	$ 173,513	$ 173,513	$ 173,513	General short-term stormwater controls during reclamation assumed at 10% of post-closure stormwater costs.
Site Infrastructure - Utilities	Demolition	Effluent WTP Discharge - Effluent WTP to River	$ -	$ -	$ -	219.00	219.00	219.00	m	$ 21.85	$ 4,785	$ 4,785	$ 4,785	
	Demolition	Mine Water - UG Portal to North Pond 1	$ -	$ -	$ -	1191.00	1191.00	1191.00	m	$ 21.79	$ 25,955	$ 25,955	$ 25,955	
	Demolition	Plant - Fire Water	$ -	$ -	$ -	1053.00	1053.00	1053.00	m	$ 21.76	$ 22,910	$ 22,910	$ 22,910	
	Demolition	Plant - Potable Water	$ -	$ -	$ -	1053.00	1053.00	1053.00	m	$ 21.76	$ 22,910	$ 22,910	$ 22,910	
	Demolition	Plant - Sewer	$ -	$ -	$ -	453.00	453.00	453.00	m	$ 21.77	$ 9,860	$ 9,860	$ 9,860	
	Demolition	Potable Water - Ontagonon Potable WTP to UG Portal	$ -	$ -	$ -	1290.00	1290.00	1290.00	m	$ 21.81	$ 28,130	$ 28,130	$ 28,130	
	Demolition	Raw Water - Ontagonon WTP to Raw Water Tank	$ -	$ -	$ -	1425.00	1425.00	1425.00	m	$ 21.78	$ 31,030	$ 31,030	$ 31,030	
	Demolition	Temporary Ore Stockpile - Collection Pond to Bedell Pond	$ -	$ -	$ -	2907.00	2907.00	2907.00	m	$ 21.80	$ 63,365	$ 63,365	$ 63,365	
	Demolition	Tirewash and Truck Shop - Truck shop/wash to Bedell Pond	$ -	$ -	$ -	1425.00	1425.00	1425.00	m	$ 21.78	$ 31,030	$ 31,030	$ 31,030	
	Demolition	Trenching/Excavation for Underground Pipe Removal	$ -	$ -	$ -	22032.00	22032.00	22032.00	m^3	$ 7.25	$ 159,790	$ 159,790	$ 159,790	
	Equipment Removal	HV Power Switchyard and Power Distribution			*	1.00	1.00	1.00	LS	$ 725,000.00	$ 725,000	$ 725,000	$ 725,000	
Surface Facilities	Demolition	Concrete Demolition	$ -	$ -	$ -	1226.00	1226.00	1226.00	m^3	$ 50.00	$ 61,300	$ 61,300	$ 61,300	
	Demolition	Fuel Station	$ -	$ -	$ -						$ 25,000	$ 25,000	$ 25,000	
	Demolition	Infrastructure Buildings	$ -	$ -	$ -						$ 150,000	$ 150,000	$ 150,000	
	Demolition	Mine Dry/Crib	$ -	$ -	$ -						$ 36,250	$ 36,250	$ 36,250	
	Demolition	Truckshop Allowance	$ -	$ -	$ -						$ 145,000	$ 145,000	$ 145,000	
	Disposal	Mixed waste	$ -	$ -	$ -	28113.60	28113.60	28113.60	tonnes	$ 217.50	$ 6,114,708	$ 6,114,708	$ 6,114,708	
	Disposal	Removal of potentially impacted soils, if required	$ -	$ -	$ -						$ 362,500	$ 362,500	$ 362,500	
	Disposal	Steel	$ 4,800,000.00	$ 1,600,000.00	$ 400,000.00	843.30	843.30	843.30	tonnes	$ 217.50	$ 183,418	$ 183,418	$ 183,418	
	Equipment Removal	Mechanical and Electrical Demolition	$ 78,000,000.00	$ 26,000,000.00	$ 6,500,000.00									
	Equipment Removal	Natural Gas Turbine			*	1.00	1.00	1.00	LS	$ 7,250,000.00	$ 7,250,000	$ 7,250,000	$ 7,250,000	
	Reclamation	Non-Process Infrastructure Area (Grading/contouring/scarification/ organics/revegetation)	$ -	$ -	$ -	13.00	13.00	13.00	acre	$ 29,000.00	$ 377,000	$ 377,000	$ 377,000	
	Reclamation	Ore Stockpile/Crusher Area (Grading/contouring/scarification/ organics/revegetation)	$ -	$ -	$ -	22.00	22.00	22.00	acre	$ 29,000.00	$ 638,000	$ 638,000	$ 638,000	
Tailings Storage Facility	Equipment Removal	Conveyance Removal/Closure	$ 169,505.28	$ 169,505.28	$ 441,863.07	13785.00	13785.00	41354.99	feet	$ 8.78	$ 121,092	$ 121,092	$ 363,285	Removal of tailings basin infrastructure. Reclaim pumps are anticipated to remain for at least 5 years after final depsoition. Tailings delivery pipelines can be removed. A total of 8,861 m of steel pipe and 3,744 m of HDPE pipe could be removed. Salvage cost only calculated for steel.
	Monitoring	Long-term Monitoring Requirements	$ -	$ -	$ -			30.00	years	$ 25,000.00	$ -	$ 750,000	$ 750,000	Assume 25 years of dam inspection/monitoring. Assumes 25 years at $30,000 per year. Assumes 5-year inspections of TDFs by engineer and annual monitoring of site personnel.
	Reclamation	Revegetation of tailings	$ -	$ -	$ -	0.00	1231.68	3279.25	acres	$ 2,000.00	$ -	$ 2,463,360	$ 6,558,505	Assume revegetation of the majority of the tailings basin minus the reclaim ponded area. Based on a total area of 13,270,718 m^2 ($3,100 acres) with hydroseeding @$2,000/acre.

Table 2 (continued)

Area	Category	Description	EOC Salvage Rate	Y10 Salvage Rate	LOM Salvage Rate	EOC Quantity	Y10 Quantity	LOM Quantity	Units	Unit Cost (USD)	EOC Cost	Y10 Cost	LOM Cost	Comment
Water Treatment Plant	Equipment Removal	Wastewater Plant Decomissioning and Material Disposal	$ 15,200,000.00	$ -	$ 9,233,900.00	1.00	1.00	1.00	LS	40%	$ 5,185,600	$ 5,185,600	$ 5,185,600	WTP 30% Design- Attachments 5&6 - Estimated OPEX Costs and Equipment Salvage Value Tables. Assumes Equipment removal is approximately 40% of installation cost.
	Post-closure Treatment	Operating costs 5 years of water treatment	$ -	$ -	$ -	4130430.00	4130430.00	7729200.00	dollars	Variable	$ -	$ 20,652,150	$ 38,646,000	WTP 30% Design- Attachments 5&6 - Estimated OPEX Costs and Equipment Salvage Value Tables. nnual O&M costs for Years 1–11 are estimated at $4.13M/year, dominated by electrical power (~$2.76M/year at $0.175/kWh) and residuals disposal (**filter press solids ~$0.29M/year and crystallizer solids ~$0.69M/year, including tipping fees and hauling). The remaining annual costs are primarily reagents (coagulant, polymer, caustic, acid, sanitizer, lime, and CO_2) and periodic membrane replacements (UF/RO/seawater RO) allocated on a 5-year replacement cycle.
SubTotals			$ 203,124,498	$ 126,316,947	$ 92,494,117						$ 46,865,852	$ 93,872,747	$ 122,171,678	
Agency Costs											$ 4,686,585	$ 9,387,275	$ 12,217,168	
Totals											$ 51,552,437	$ 103,260,022	$ 134,388,846	

Prepared by: MJG4
Checked by: KB

Notes:
*Salvage included in "mechanical and Electrical Demolition"
ft^2 = square feet
ft^3 = cubic feet
LOM = Life of Mine
LS = lump sum
m = meter
m^3 = cubic meter
WTP = Water Treatment Plant