DEPARTMENT OF ECOLOGY
State of Washington

Application for a State Waste Discharge Permit to Discharge Industrial Wastewater to Ground Water by Land Treatment or Application

This application is for a state waste discharge permit as required by Chapter 90.48 RCW and Chapter 173-216 WAC. Permit applications provide Ecology with information on pollutants in the waste stream, materials that may enter the waste stream, the flow characteristics of the discharge, and the site characteristics at the point of discharge.

Ecology may request additional information to clarify the conditions of this discharge. The applicant should reference information previously submitted to Ecology that applies to this application in the appropriate section.

SECTION A. GENERAL INFORMATION

1. Applicant name: Echo Bay Minerals Company

2. Facility name: Kettle River Operations
(if different from applicant)

3. Applicant mail address: 363 Fish Hatchery Road
Street

Republic, Washington 99166
City/State Zip

4. Facility location address: Same
(if different from above)
Street

City/State Zip

5. UBI No. 601050058

Sometimes called a registration, tax, "C," or resale number, the Unified Business Identifier (UBI) number is a nine-digit number used to identify persons engaging in business activities. The number is assigned when a person completes a Master Business Application to register with or obtain a license from state agencies. The Departments of Revenue, Licensing, Employment Security, Labor and Industries, and the Corporations Division of the Secretary of State are among the state agencies participating in the UBI program.

6. Latitude/longitude of the processing facility as decimal degrees (NAD83/WGS84):
See Attachment G1 / _____

FOR ECOLOGY USE ONLY	Check One	New/Renewal ☐ Modification ☐
Date application received		Application/Permit no.
Date application accepted		Date fee paid

7. Person to contact who is familiar with the information contained in this application:

Gary R. Johnson	Environmental Superintendent
Name	Title
509-775-8530	(509) 775-3447
Telephone number	Fax number

8. Check One:

☒ **Permit renewal** (including renewal of temporary permits authorized by RCW 90.48.200)

Does this application request a greater amount of wastewater discharge, a greater amount of pollutant discharge, or a discharge of different pollutants than specified in the last permit application for this facility? ☐ YES ☒ NO

For permit renewals, the current permit is an attachment, by reference, to this application.

☐ **Permit modification** ☐ **Existing unpermitted discharge** ☐ **Proposed discharge**

Anticipated date of discharge: _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and/or imprisonment for knowing violations.

[signature]	4-30-19	President & General Manager
Signature*	Date	Title

Mark Ioli
Printed name

*Applications must be signed as follows: Corporations, by a principal executive officer of at least the level of vice-president; partnership, by a general partner; sole proprietorship, by the proprietor. If these titles do not apply to your organization, the person who makes budget decisions for this facility must sign the application.

The application signatory may delegate signature authority for submittals required by the permit, such as monthly reports, to a suitable employee. You can delegate this authority to a qualified individual or to a position, which you expect to fill with a qualified individual. If you wish to delegate signature authority, please complete the following:

Dan Johnson	4-30-19	Environmental Manager
Signature of delegated employee	Date	Title or function at the facility

Gary Johnson
Printed name

SECTION B. PRODUCT INFORMATION

1. Briefly describe all manufacturing processes and products, and/or commercial activities at this facility. Provide the applicable Standard Industrial Category (SIC) and the North American Industry Classification System (NAICS) Code(s) for each activity (see *North American Industrial Classification System,* 2007 ed.). You can find the 1997 NAICS codes and the corresponding 1987 Standard Industry Category (SIC) codes at (http://www.census.gov/epcd/naics/frames3.htm).

Description:

The ST0008033 permit renewal application for the Kettle River Operations (KRO) is for discharge of water from the Key Mill facility. A water bio-treatment plant is currently operating at the Key Mill site and is authorized under this permit for discharge of treated water to infiltration galleries.

The Key Mill is a precious metals ore processing facility. Ore is trucked for processing from operating mine sites in the United States and Canada. In the milling process, the ore is crushed, then mixed with water and pulverized to form a slurry. Cyanide is then added to the slurry and pumped through a series of tanks containing activated carbon. The gold is leached from the ore and adsorbed onto the carbon. Gold and silver are then stripped from the carbon using a hot caustic solution and recovered on stainless steel cathodes within electrowinning cells. Sludge from the electrowinning cells is refined on-site into doré bars. The spent slurry remaining from the process is treated to reduce the cyanide levels and is sent to the lined tailings pond. The mill in currently in temporary shut-down, however, the quantities are provided for operational conditions.

In addition to managing the mill tailings, the lined tailings pond is also used to manage reverse osmosis (RO) concentrate. This water is brought to the tailings pond from the K2 water treatment plant and the Buckhorn water treatment plant. The operations of these two plants are approved under other permits.

2. List raw materials and products:

Type	RAW MATERIALS	Quantity
Gold Ore		803,000 tons per year

Type	PRODUCTS	Quantity
Doré		150,000 ounces per year

SECTION C. PLANT OPERATIONAL CHARACTERISTICS

1. For each process listed in B.1that generates wastewater, list the process, assign the waste stream a name and ID #, and describe whether it is a batch or continuous flow.

Process	Waste Stream Name	Waste Stream ID#	Batch (B) or Continuous (C) Process
Water Treatment	Underdrain Bio-treatment System	1	Continuous

2. On a separate sheet, produce a schematic drawing showing production processes and water flow through the facility and wastewater treatment devices *(label as attachment C2)*. The drawing should indicate the source of intake water and the operations contributing wastewater to the effluent and should label the treatment units. Construct the water balance by showing average flows between intakes, operations, treatment units, and points of discharge to land. If a water balance cannot be determined *(e.g., for certain mining activities)*, provide a description of the nature and amount of any sources of water and any collection or treatment measures.

3. What is the highest daily discharge flow from the processing facility:
(Specify the time period for the value given)

1) 14401.3 avg (monthly) gallons per day (2018)

What is the highest daily discharge flow to the sprayfields/infiltration basin:
(Specify the time period for the value given)

NA inches/acre/month OR

What is the highest average monthly discharge flow (daily flows averaged over a month) from the processing facility:
(Specify the time period for the value given)

1) 14,401.3 avg gallons per day (2018)

What is the highest average monthly discharge flow to the sprayfields:
(Specify the time period for the value given)

NA inches/acre/month OR

4. Describe any planned wastewater treatment or sprayfield/infiltration improvements and the schedule for the improvements or changes. *(Use additional sheets, if necessary and label as attachment C4.)*

NA

5. If production processes are subject to seasonal variations, provide the following information. List discharge for each wastestream in gallons or million gallons per month. The combined value for each month should equal the estimated total monthly flow. Please indicate the proper unit by checking one of the following boxes:

☐ gallons per day ☒ gallons per month ☐ million gallons per month

Waste Stream ID#	MONTHS											
	J	F	M	A	M	J	J	A	S	O	N	D
NA - Continuous Flow in Underdrain Water Treatment Plant												
Estimated total gallons												

6. If this is a discharge from the processing facility to a storage or evaporative lagoon, what is the size of the lagoon (give square footage for the bottom of the lagoon and the total volume of the lagoon at full operating depth). *10,000 square feet; 10 million gallons (Example)*

#1. NA

7. Check the applicable box. If this is a discharge to a sprayfield ☐ or an infiltration bed ☒? Provide the average gallons per acre per day proposed for each month in the following table.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov	Dec
Estimated gallons per acre per day	1440000	1440000	1440000	1440000	1440000	1440000	1440000	1440000	1440000	1440000	1440000	1440000

8. How many hours a day does this facility typically operate? 1. 24 hrs
How many days a week does this facility typically operate? 1. 7 days
How many weeks per year does this facility typically operate? 1. 52 wks

9. List all incidental materials such as oil, paint, grease, solvents, and cleaners that are used or stored on site (list only those with quantities greater than 10 gallons for liquids and 50 pound quantities for solids). For solvents and solvent-based cleaners, include a copy of the material safety data sheet for each material and estimate the quantity used. *Use additional sheets, if necessary and label as attachment C.7.)*

Attached as C.7

Materials/Quantity Stored: **See Attachment C.7**

10.	Some types of facilities are required to have spill or waste control plans. Does this facility have:	Yes	No
a.	A spill prevention, control, and countermeasure plan (40 CFR 112)?	☒	☐
b.	An Oil Spill Contingency Plan (chapter 173-182 WAC)?	☐	☒
c.	An emergency response plan (per WAC 173-303-350)?	☒	☐
d.	A runoff, spillage, or leak control plan (per WAC 173-216-110(f))?	☒	☐
e.	Any spill or pollution prevention plan required by local, state or federal authorities? If yes specify: SWPPP	☒	☐
f.	A solid waste control plan?	☒	☐

SECTION D. WATER CONSUMPTION AND WATER LOSS

1. Potable water source(s):

☒ ☐ Public system (Specify name) System ID#: AA 8586

☐ ☐ Private well ☐ Surface water (Specify name of water body) _____

a. Water right permit number: G3-28479C

b. Legal description of water source:

SE ¼S, SW ¼S, 26 , Section, 37 TWN, 33 R

2. Potable water use

a. Indicate total water use: Gallons per day (average) 61,582gal

Gallons per day (maximum) 86,256gal

b. Is water metered? ☒ YES ☐ NO

3. Supplemental Irrigation water source(s):

☐ ☐ Public system or Irrigation District (Specify name) _____

☐ ☐ Private well ☐ Surface water (Specify name of water body) _____

a. Water right permit number: _____

b. Legal description of water source:

_____ ¼S, _____ ¼S, _____, Section, _____ TWN, _____ R

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SECTION E. WASTEWATER INFORMATION

How are the water intake and effluent flows measured?

Intake: Flow meters

Effluent Intake flowmeter provides effluent flow value

Describe the collection method for the samples analyzed below. (*i.e.*, grab, 24-hour composite). Applicants must collect gral (not composites) for analysis of pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform (inc coli), and Enterococci (previously known as fecal streptococcus at § 122.26 (d)(2)(iii)(A)(3)),or volatile organics.

Grab samples are collected at the Water Treatment Plant's effluent sample point. Samples are then submitted to a Washingt accredited environmental laboratory for analysis

Has the effluent been analyzed for any other parameters than those identified in question E.4.? ☒ YES ☐ NO
If yes, attach results and label as attachment E.4. This data must clearly show the date, method and location of sampling. *(N may require additional testing.)*

Provide measurements or range of measurements for treated wastewater prior to discharge to the POTW for the parameters in the left column. If you obtain the application from the internet, contact Ecology's regional office to see if testing for a sul parameters is permissible. All analyses (except pH) must be conducted by a laboratory registered or accredited by Ecology (216-125). If this is an application for permit renewal, provide data for the last year for those parameters that are routinely m parameters measured only for this application, place the values under "Maximum." Report the values with units as specified parameter name or in the detection level.

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the followi unless Ecology approves an alternate method or the method used produces measurable results in the sample and EPA has lis EPA approved method in 40 CFR Part 136. If the Permittee uses an alternative method as allowed above, it must report the DL, and QL on the discharge monitoring report or in the required report. **Data is provided below for 2018.**

Parameter	Measurement Values			Number of Analyses	Analytical Method Std. Methods 19th,20th edition or EPA	Dete Limit/Qua Le
	Minimum	Maximum	Average			
) (5 day)					SM 5210 B	/2 n
)					SM 5220 D	/10
l suspended solids					SM 2540 D	/5 n
d Dissolved Solids					SM 2540 E	
l dissolved solids	395	488	434.3	13	SM 2540 C	
ductivity romhos/cm)					SM 2510 B	
nonia-N as N					SM 4500-NH_3 C	/0.3
	6.5	7.7	7.0	83	SM 4500-H	0.1 stand
al coliform anisms/100 mL)					SM 9221 E or 9222 D	
l coliform anisms/100 mL)					SM 9221 B or 9222 B	
olved oxygen					SM 4500-O C/G	
te + nitrite-N as N	<100	2880	179	58	SM 4500-NO_3 E	100
l kjeldahl N as N					SM 4500-N_{org} C/E/FG	300
o-phosphate-P as P					SM 4500-P E/F	10
l-phosphorous-P as P					SM 4500-P E/P/F	10
l Oil & grease					EPA 1664A	1.4/5
TPH - Dx					Ecology NWTPH Dx	250/25
TPH - Gx					Ecology NWTPH Gx	250/25
ium					EPA 200.7	10
ride					SM 4500-Cl C	0.15
ride					SM 4500-F E	.025/0.
nesium					EPA 200.7	10/50
ssium					EPA 200.7	700/

Parameter	Measurement Values			Number of Analyses	Analytical Method Std. Methods 19th,20th edition or EPA	Dete Limit/Qua Le
	Minimum	Maximum	Average			
um					EPA 200.7	29/
ate	27,100	203,000	82,270	58	SM 4500-SO_4 C/D	/200
linity as $CaCO_3$					SM 2320 B	/5 mg/L a
nic(total)					EPA 200.8	0.1/0.
um (total)					EPA 200.8	0.5/2
nium (total)					EPA 200.8	.05/.2
mium (total)					EPA 200.8	0.2/1
per (total)					EPA 200.8	0.4/2
(total)	<50	<50	<50	11	EPA 200.7	12.5/5
l (total)					EPA 200.8	0.1/.5
ganese (total)	2.12	20.8	11.2	11	EPA 200.8	0.1/0.
cury (total) pg/L					EPA 1631E	0.2/0.
bdenum(total)					EPA 200.8	0.1/0.
el(total)					EPA 200.8	0.1/0.
nium (total)					EPA 200.8	1/1
r (total)					EPA 200.8	.04/.2
(total)					EPA 200.8	0.5/2.

Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confide that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR part 136, Appendix B.

Quantitation Level (QL) also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recogni signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has use method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer. (64 FR 30417).

ALSO GIVEN AS:

The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitte the US Environmental Protection Agency December 2007).

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part of the manufacturing process, or are they present in the wastewater? (*The number following the chemical name is the Chemical Abstract Service (CAS) reference number to aid in identifying the compound.*) ☐ YES ☒ NO

If yes, specify how the chemical is used and the quantity used or produced *(Use additional sheets, if necessary and label as attachment E5.)*:

Acrylamide/79-06-1
Acrylonitrile/107-13-1
Aldrin/309-00-2
Aniline/62-53-3
Aramite/140-57-8
Arsenic/7440-38-2
Azobenzene/103-33-3
Benzene/71-43-2
Benzidine/92-87-5
Benzo(a)pyrene/50-32-8
Benzotrichloride/98-07-7
Benzyl chloride/100-44-7
Bis(chloroethyl)ether/111-44-4
Bis(chloromethyl)ether/542-88-1
Bis(2-ethylhexyl) phthalate/ 117-81-7
Bromodichloromethane/75-27-4
Bromoform/75-25-2
Carbazole/86-74-8
Carbon tetrachloride/56-23-5
Chlordane/57-74-9
Chlorodibromomethane/124-48-1
Chloroform/67-66-3
Chlorthalonil/1897-45-6
2,4-D/94-75-7
DDT/50-29-3
Diallate/2303-16-4
1,2 Dibromoethane/106-93-4
1,4 Dichlorobenzene/106-46-7
3,3' Dichlorobenzidine/91-94-1
1,1 Dichloroethane/75-34-3
1,2 Dichloroethane/107-06-2
Nitrofurazone/59-87-0
N-nitrosodiethanolamine/ 1116-54-7
N-nitrosodiethylamine/55-18-5
N-nitrosodimethylamine/62-75-9
N-nitrosodiphenylamine/86-30-6
N-nitroso-di-n-propylamine/ 621-64-7
N-nitrosopyrrolidine/930-55-2
N-nitroso-di-n-butylamine/ 924-16-3
N-nitroso-n-methylethylamine/ 10595-95-6
PAH/NA
PBBs/NA
PCBs/1336-36-3
1,2 Dichloropropane/78-87-5
1,3 Dichloropropene/542-75-6
Dichlorvos/62-73-7
Dieldrin/60-57-1
3,3' Dimethoxybenzidine/119-90-4
3,3 Dimethylbenzidine/119-93-7
1,2 Dimethylhydrazine/540-73-8
2,4 Dinitrotoluene/121-14-2
2,6 Dinitrotoluene/606-20-2
1,4 Dioxane/123-91-1
1,2 Diphenylhydrazine/122-66-7
Endrin/72-20-8
Epichlorohydrin/106-89-8
Ethyl acrylate/140-88-5
Ethylene dibromide/106-93-4
Ethylene thioureae/96-45-7
Folpet/133-07-3
Furmecyclox/60568-05-0
Heptachlor/76-44-8
Heptachlor epoxide/1024-57-3
Hexachlorobenzene/118-74-1
Hexachlorocyclohexane (alpha)/ 319-84-6
Hexachlorocyclohexane (tech.)/ 608-73-1
Hexachlorodibenzo-p-dioxin, mix/19408-74-3
Hydrazine/hydrazine sulfate/ 302-01-2
Lindane/58-89-9
2 Methylaniline/100-61-8
2 Methylaniline hydrochloride/ 636-21-5
4,4' Methylene bis(N,N- dimethyl)aniline/101-61-1
Methylene chloride (dichloromethane)/75-09-2
Mirex/2385-85-5
O-phenylenediamine/106-50-3
Propylene oxide/75-56-9
2,3,7,8-Tetrachlorodibenzo-p-dioxin/ 1746-01-6
Tetrachloroethylene/127-18-4
2,4 Toluenediamine/95-80-7
o-Toluidine/95-53-4
Toxaphene/8001-35-2
Trichloroethylene/79-01-6
2,4,6-Trichlorophenol/88-06-2
Trimethyl phosphate/512-56-1
Vinyl chloride/75-01-4

6. Are any other pesticides, herbicides, or fungicides used at this facility? ☒ YES ☐ NO

If yes, specify the material and quantity used.

Weed Spray Chemicals - Total quantities used on site: **Trifoil - 55 oz., Basecamp - 110 oz, Detonate - 11 oz., and Syltac - 55 oz.**

7. Are there other pollutants that you know of or believe to be present? ☐ YES ☒ NO

If yes, specify the pollutants and their concentration if known (attach laboratory analyses if available). ☐ DON'T KNOW

SECTION F. GROUND WATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Attach well logs when available. Copy this page as necessary for each well. Provide the latitude and longitude in decimal format.

Ecology Well Tag ID # 438078 *(exampleAAB123)*

Well ID # TP-1

Latitude: 48.6682523

Longitude: -118.593998

Well Elevation (to the nearest 0.01 feet) 3069.6 Check the appropriate box; the elevation measurement is relative to: the NAVD88 standard ☐ mean sea level ☒

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L				
Total dissolved solids	mg/L	524 - 744	22	SM 2540	10
Dissolved Fixed Solids	mg/L				
pH	Standard units	7.3 – 8.32	18	SM 4500 H B	-
Conductivity	(micromhos/cm)				
Alkalinity	mg/L as $CaCO_3$	201 - 499	22	SM 2320 B	1.0
Total hardness	mg/L	419 - 616	19	SM 2340 B	1.49
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L	<0.013 – 0.066	22	EPA 350.1	0.013
Nitrate + nitrite-N, nitrate as N	mg/L	1.96 – 7.47	22	EPA 353.2	0.098
Total kjeldahl N as N	mg/L	<0.50	1	EPA 351.2	0.22
Ortho-phosphate-P as P	mg/L	<0.004 – 0.332	12	SM 4500-P-E	0.004
Total-phosphate-P as P	mg/L	<0.01 – 0.191	10	SM 4500-P-C	0.01
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	☐mg/L ☐ µg/l				
Calcium	☒mg/L ☐ µg/l	132 - 195	22	EPA 200.7	0.069
Chloride	☒mg/L ☐ µg/l	2.2 – 19.6	22	EPA 300.0	0.70
Fluoride	☒mg/L ☐ µg/l	<0.022	1	EPA 300.0	0.022
Magnesium	☒mg/L ☐ µg/l	21.7 – 31.7	22	EPA 200.7	0.32
Potassium	☒mg/L ☐ µg/l	2.21 – 3.99	22	EPA 200.7	0.18
Sodium	☒mg/L ☐ µg/l	14.6 – 38.2	22	EPA 200.7	0.12
Sulfate	☒mg/L ☐ µg/l	55.3 - 154	22	EPA 300.0	4.5
Barium	☒mg/L ☐ µg/l	<0.00031 – 0.178	22	EPA 200.8	0.00031
Cadmium	☒mg/L ☐ µg/l	<0.000063 – 0.00016	22	EPA 200.8	0.000063
Chromium	☐mg/L ☐ µg/l				
Copper	☒mg/L ☐ µg/l	<0.00036 – 0.00376	22	EPA 200.8	0.00036
Iron	☒mg/L ☐ µg/l	<0.056	22	EPA 200.7	0.056
Lead	☒mg/L ☐ µg/l	<0.00014	22	EPA 200.8	0.00014

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
Manganese	☒mg/L ☐ µg/l	<0.000110 - 0.00356	22	EPA 200.8	0.000110
Mercury	☒mg/L ☐ µg/l	<0.000093	12	EPA 245.1	0.000093
Selenium	☒mg/L ☐ µg/l	<0.0002 – 0.0019	22	EPA 200.8	0.0002
Silver	☒mg/L ☐ µg/l	<0.000061	22	EPA 200.8	0.000061
Zinc	☐mg/L ☐ µg/l	<0.0027 – 0.043	22	EPA 200.8	0.0027
Depth to water level (to the nearest .01 feet)		22.73 – 39.08	22	-	-

Ecology Well Tag ID # 438079 *(exampleAAB123)*
Well ID # TP-2
Latitude: 48.6682523
Longitude: -118.593998

Well Elevation (to the nearest 0.01 feet) 3097.73 Check the appropriate box; the elevation measurement is relative to: the NAVD88 standard ☐ mean sea level ☒

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L				
Total dissolved solids	mg/L	470 - 647	21	SM 2540	10
Dissolved Fixed Solids	mg/L				
pH	Standard units	7.6 – 8.3	17	SM 4500 H B	-
Conductivity	(micromhos/cm)				
Alkalinity	mg/L as $CaCO_3$	166 - 461	21	SM 2320 B	1.0
Total hardness	mg/L	343 - 485	18	SM 2340 B	1.49
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L	<0.013 – 0.106	21	EPA 350.1	0.013
Nitrate + nitrite-N, nitrate as N	mg/L	0.422 – 6.22	21	EPA 353.2	0.098
Total kjeldahl N as N	mg/L	<0.50	1	EPA 351.2	0.22
Ortho-phosphate-P as P	mg/L	<0.004 – 0.082	11	SM 4500-P-E	0.004
Total-phosphate-P as P	mg/L	<0.01 – 0.125	10	SM 4500-P-C	0.01
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	☐mg/L ☐ µg/l				
Calcium	☒mg/L ☐ µg/l	105 -152	21	EPA 200.7	0.069
Chloride	☒mg/L ☐ µg/l	2.43 - 8.95	21	EPA 300.0	0.70
Fluoride	☒mg/L ☐ µg/l	<0.022	1	EPA 300.0	0.022
Magnesium	☒mg/L ☐ µg/l	18.8 – 31.7	21	EPA 200.7	0.32
Potassium	☒mg/L ☐ µg/l	2.34 – 4.45	21	EPA 200.7	0.18
Sodium	☒mg/L ☐ µg/l	15.1 – 42.6	21	EPA 200.7	0.12
Sulfate	☒mg/L ☐ µg/l	59.3 - 167	21	EPA 300.0	4.5
Barium	☒mg/L ☐ µg/l	0.113 – 0.197	21	EPA 200.8	0.00031
Cadmium	☒mg/L ☐ µg/l	<0.000063 – 0.00014	21	EPA 200.8	0.000063
Chromium	☐mg/L ☐ µg/l				
Copper	☒mg/L ☐ µg/l	<0.00036 – 0.00242	21	EPA 200.8	0.00036
Iron	☒mg/L ☐ µg/l	<0.056	21	EPA 200.7	0.056
Lead	☒mg/L ☐ µg/l	<0.00014	21	EPA 200.8	0.00014
Manganese	☒mg/L ☐ µg/l	<0.000110 – 0.292	21	EPA 200.8	0.000110
Mercury	☒mg/L ☐ µg/l	<0.000093	12	EPA 245.1	0.000093
Selenium	☒mg/L ☐ µg/l	<0.002 – 0.0024	21	EPA 200.8	0.0002

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
Silver	☒mg/L ☐ µg/l	<0.000061 – 0.000369	21	EPA 200.8	0.000061
Zinc	☒mg/L ☐ µg/l	<0.0027 – 0.0043	21	EPA 200.8	0.0027
Depth to water level (to the nearest .01 feet)		50.01 – 61.15	21		-

Ecology Well Tag ID # APB_APB303_ *(exampleAAB123)*

Well ID # TP-2A

Latitude: 48.6683507

Longitude: -118.6160064

Well Elevation (to the nearest 0.01 feet) 3101.02 Check the appropriate box; the elevation measurement is relative to: the NAVD88 standard ☐ mean sea level ☒

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L				
Total dissolved solids	mg/L	568 - 663	20	SM 2540	10
Dissolved Fixed Solids	mg/L				
pH	Standard units	7.84 – 8.05	15	SM 4500 H B	-
Conductivity	(micromhos/cm)				
Alkalinity	mg/L as $CaCO_3$	270 - 378	20	SM 2320 B	1.0
Total hardness	mg/L	408 - 472	17	SM 2340 B	1.49
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L	<0.13 – 0.057	20	EPA 350.1	0.013
Nitrate + nitrite-N, nitrate as N	mg/L	6.43 – 19.5	20	EPA 353.2	0.098
Total kjeldahl N as N	mg/L				
Ortho-phosphate-P as P	mg/L	<0.004 – 0.04	10	SM 4500-P-E	0.004
Total-phosphate-P as P	mg/L	<0.01 – 0.128	9	SM 4500-P-C	0.01
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	☐mg/L ☐ µg/l				
Calcium	☒mg/L ☐ µg/l	125 - 146	20	EPA 200.7	0.069
Chloride	☒mg/L ☐ µg/l	13.4 - 24	20	EPA 300.0	0.70
Fluoride	☐mg/L ☐ µg/l				
Magnesium	☒mg/L ☐ µg/l	22.9 – 25.9	20	EPA 200.7	0.32
Potassium	☒mg/L ☐ µg/l	1.54 – 3.29	20	EPA 200.7	0.18
Sodium	☒mg/L ☐ µg/l	25.4 – 32.9	20	EPA 200.7	0.12
Sulfate	☒mg/L ☐ µg/l	132 - 155	20	EPA 300.0	4.5
Barium	☒mg/L ☐ µg/l	0.0728 – 0.0959	20	EPA 200.8	0.00031
Cadmium	☒mg/L ☐ µg/l	<0.000063 – 0.00025	20	EPA 200.8	0.000063
Chromium	☐mg/L ☐ µg/l				
Copper	☒mg/L ☐ µg/l	<0.00036 – 0.00108	20	EPA 200.8	0.00036
Iron	☒mg/L ☐ µg/l	<0.056	20	EPA 200.7	0.056

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
Lead	☒mg/L ☐ µg/l	<0.00014 – 0.00076	20	EPA 200.8	0.00014
Manganese	☒mg/L ☐ µg/l	<0.000110 – 0.00151	20	EPA 200.8	0.000110
Mercury	☒mg/L ☐ µg/l	<0.000093	11	EPA 245.1	0.000093
Selenium	☒mg/L ☐ µg/l	<0.0002 – 0.0064	20	EPA 200.8	0.0002
Silver	☐mg/L ☐ µg/l	<0.000061	20	EPA 200.8	0.000061
Zinc	☐mg/L ☐ µg/l	<0.0027	20	EPA 200.8	0.0027
Depth to water level (to the nearest .01 feet)		70.21 – 75.91	20		

Ecology Well Tag ID # NA
(exampleAAB123)
Latitude: 48.6700361

Well ID # TP-3

Longitude: -118.6114639

Well Elevation (to the nearest 0.01 feet) 3054.32 Check the appropriate box; the elevation measurement is relative to: the NAVD88 standard ☐ mean sea level ☒

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)	mg/L				
COD	mg/L				
Total organic carbon	mg/L				
Total dissolved solids	mg/L	328 - 385	31	SM 2540	10
Dissolved Fixed Solids	mg/L				
pH	Standard units	7.63 – 8.05	17	SM 4500 H B	-
Conductivity	(micromhos/cm)				
Alkalinity	mg/L as $CaCO_3$	191 - 222	21	SM 2320 B	1.0
Total hardness	mg/L	247 - 285	17	SM 2340 B	1.49
Fecal coliform	organisms/100mL				
Total coliform	organisms/100mL				
Dissolved oxygen	mg/L				
Ammonia-N	mg/L	<0.013 – 0.053	21	EPA 350.1	0.013
Nitrate + nitrite-N, nitrate as N	mg/L	2.76 – 6.61	31	EPA 353.2	0.098
Total kjeldahl N as N	mg/L	<0.50	1	EPA 351.2	0.22
Ortho-phosphate-P as P	mg/L	0.015 – 0.067	11	SM 4500-P-E	0.004
Total-phosphate-P as P	mg/L	<0.01– 0.0464	10	SM 4500-P-C	0.01
Total Oil and Grease	mg/L				
Total petroleum hydrocarbon	☐mg/L ☐ µg/l				
Calcium	☒mg/L ☐ µg/l	75.6 - 87	21	EPA 200.7	0.069
Chloride	☒mg/L ☐ µg/l	6.58 – 10.2	21	EPA 300.0	0.70
Fluoride	☒mg/L ☐ µg/l	0.343	1	EPA 300.0	0.022
Magnesium	☒mg/L ☐ µg/l	14.2 – 16.4	21	EPA 200.7	0.32
Potassium	☒mg/L ☐ µg/l	1.73 – 2.14	21	EPA 200.7	0.18
Sodium	☒mg/L ☐ µg/l	18.3 - 21.2	21	EPA 200.7	0.12

Parameter	Units	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
Sulfate	☒mg/L ☐ µg/l	74.8 - 90	21	EPA 300.0	4.5
Barium	☒mg/L ☐ µg/l	0.0522 – 0.06	21	EPA 200.8	0.00031
Cadmium	☒mg/L ☐ µg/l	<0.000063 – 0.00042	21	EPA 200.8	0.000063
Chromium	☐mg/L ☐ µg/l				
Copper	☒mg/L ☐ µg/l	<0.00036 – 0.00208	21	EPA 200.8	0.00036
Iron	☒mg/L ☐ µg/l	<0.056 – 0.07	21	EPA 200.7	0.056
Lead	☒mg/L ☐ µg/l	<0.00014	21	EPA 200.8	0.00014
Manganese	☒mg/L ☐ µg/l	<0.000110 – 0.00125	21	EPA 200.8	0.000110
Mercury	☒mg/L ☐ µg/l	<0.000093	13	EPA 245.1	0.000093
Selenium	☒mg/L ☐ µg/l	<0.0002 – 0.0017	21	EPA 200.8	0.0002
Silver	☒mg/L ☐ µg/l	<0.000061	21	EPA 200.8	0.000061
Zinc	☒mg/L ☐ µg/l	<0.0027 – 0.0403	21	EPA 200.8	0.0027
Depth to water level (to the nearest .01 feet)		88.55 – 104.44	31		

SECTION G. SITE ASSESSMENT

The local library and local city or county planning offices may be helpful in providing the information required in this section. You may consult the Department of Ecology Water Resources Program to help identify wells within one mile of your site.

1. Land Application Sites: Provide the information below for <u>each</u> land application site. Provide the latitude/longitude (approximate center of the site; NAD83/WGS84 reference datum.) Attach a copy of the contract(s) authorizing use of any private land(s) used for each treatment site. Add table rows as necessary.

Legal Description (section/township/range) SW1/4, T37N, R33E, S26			
Latitude	Longitude	Acreage	Owner
48.674444 N	118.604722 W	200	Echo Bay Minerals Company
Legal Description (section/township/range)			
Latitude	Longitude	Acreage	Owner
Legal Description (section/township/range)			
Latitude	Longitude	Acreage	Owner
Legal Description (section/township/range)			
Latitude	Longitude	Acreage	Owner

2. If this is a new discharge, list all environmental control permits or approvals needed for this project; for example, SEPA review, engineering reports, hydrogeologic reports, , , or air emissions permits.

   NA - Permit Renewal

3. Attach an original United States Geological Survey (USGS) 7.5 minute topographic map and aerial photograph(s) from an internet mapping site that shows the processing facility and sprayfield site(s). **USGS topographical maps are available from the Department of Natural Resources (360 902-1234), Metsker Maps (206 588-5222), some local bookstores, and internet sites.** Show the following on this map:

   a. Location and name of internal and adjacent streets.
   b. Surface water drainage systems within ¼ mile of the site.
   c. All wells within 1 mile of the site.
   d. Wastewater discharge points.
   e. Land uses and zoning adjacent to the wastewater application site.
   f. Groundwater gradient.

   This information is on file with Ecology. Maps with the surrounding wells are in attachment G.4

4. Describe the soils on the site using information from local soil survey reports. **Soils information is available from your local County Conservation District or from information contained in the sites hydrogeologic report.** *(Submit on separate sheet and label as attachment G.4.)*

This information is on file with Ecology.

5. Describe the local geology and hydrogeology within one mile of the site. Include any groundwater quality data. **The local library or local Soil Conservation Service may have this information.** *(Submit on separate sheet and label as attachment G.5.)*

This information is on file with Ecology.

6. List the names and addresses of contractors or consultants who provided information and cite sources of information by title and author.

   Ecology Wells database:
   https://fortress.wa.gov/ecy/wellconstruction/map/WCLSWebMap/WellConstructionMapSearch.aspx

SECTION H. STORMWATER

1. Do you have coverage under the Washington State Industrial Stormwater NPDES General permit? ☒ YES ☐ NO
   If yes, please list the permit number here. WAR 001184

   If no, have you applied for coverage under the Washington State Industrial Stormwater NPDES general permit? ☐ YES ☐ NO

Note: If you answered "no" to both questions above, complete the following questions 2 through 8.

2. Describe the size of the stormwater collection area.
   a. Unpaved area _____ sq.ft.
   b. Paved area _____ sq.ft.
   c. Other collection areas (roofs) _____ sq.ft.

3. Does your facility's stormwater discharge to: *(Check all that apply)*
   ☐ Storm sewer system; name of storm sewer system *(operator):*
   ☐☐ Sanitary sewer
   ☐ Directly to surface waters of Washington State *(e.g., river, lake, creek, estuary, ocean).*
   Specify waterbody name _____
   ☐ Indirectly to surface waters of Washington State *(i.e., flows over adjacent properties first).*
   ☐ Directly to ground waters of Washington State via:
   ☐☐ Dry well
   ☐ Drainfield
   ☐ Other

4. Areas with industrial activities at facility: *(check all that apply)*
   ☐☐ Manufacturing building
   ☐☐ Material handling
   ☐☐ Material storage
   ☐☐ Hazardous waste treatment, storage, or disposal *(refers to RCRA, Subtitle C facilities only)*
   ☐☐ Waste treatment, storage, or disposal
   ☐☐ Application or disposal of wastewaters
   ☐☐ Storage and maintenance of material handling equipment
   ☐☐ Vehicle maintenance
   ☐☐ Areas where significant materials remain
   ☐☐ Access roads and rail lines for shipping and receiving
   ☐☐ Other _____

5. Material handling/management practices

   a. Types of materials handled and/or stored outdoors: *(check all that apply)*

   - ☐ Solvents
   - ☐ Hazardous wastes
   - ☐ Scrap metal
   - ☐ Acids or alkalies
   - ☐ Petroleum or petrochemical products
   - ☐ Paints/coatings
   - ☐ Plating products
   - ☐ Woodtreating products
   - ☐ Pesticides
   - ☐ Other *(please list)*: _____

   b. Identify existing management practices employed to reduce pollutants in industrial storm water discharges: *(check all that apply)*

   - ☐ Oil/water separator
   - ☐ Detention facilities
   - ☐ Containment
   - ☐ Infiltration basins
   - ☐ Spill prevention
   - ☐ Operational BMPs
   - ☐ Surface leachate collection
   - ☐ Vegetation management
   - ☐ Overhead coverage
   - ☐ Other *(please list)*: _____

6. Attach a map showing stormwater drainage/collection areas, disposal areas and discharge points. This may be a hand drawn map if no other site map is available. Label this as attachment H.8.

SECTION I. OTHER INFORMATION

1. Describe liquid or solid wastes generated that are not disposed of in the waste stream(s) and describe the method of disposal. For each type of waste, provide type of waste, name, address, and phone number of hauler.

   Sludge produced from the bio-treatment plant consists of biomass and iron sulfide. Both of these materials are cleaned from tanks and pipes during maintenance. Both have been characterized and are not hazardous.

2. Describe any storage areas used for raw materials, products, and wastes.

   Informatioin is on file with DOE.

Summary of attachments that may be required for this application:
(Please check those attachments that are included)

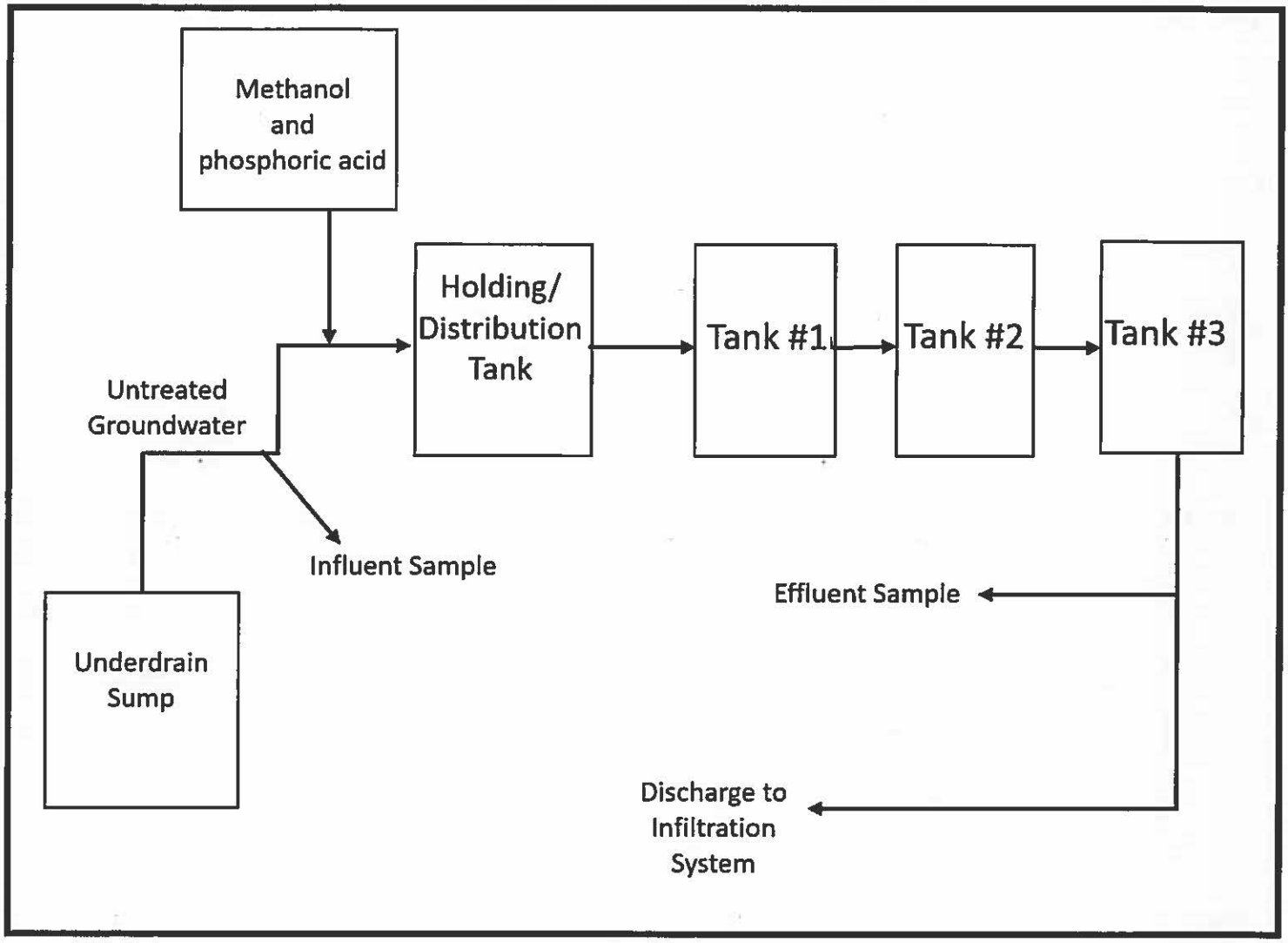
- ☒ C.2. Production schematic flow diagram and water balance
- ☐ C.4. Wastewater treatment improvements
- ☒ C.7. Additional incidental materials
- ☒ E.4. Additional results of effluent testing
- ☐ G.1. Copies of land use contracts
- ☒ G.3. USGS topographical map
- ☐ G.4. Soils description
- ☐ G.5. Local geology and hydrology
- ☐ H.8. Stormwater drainage map

If you need this document in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Attachment C.2

Production Schematic Flow Diagrams and Water Balances

#1. Underdrain Schematic



Water Balance

Description	Quantity	Units
Water In:		
Underdrain water	5 to 27	avg daily gpm
Water Out		
Underdrain bio-treatment discharge	7.5 to 10	avg daily gpm
Underdrain by-pass	0 to 17	avg daily gpm
Total Balance (based on 2018)	0	gpm

Attachment C.7

Primary Chemical List

Chemical	Quantity (est.)	Unit
Methanol	1000	gal
Phosphoric Acid	100	gal

Other incidental materials used on site are as already on record.

SAFETY DATA SHEET

Section 1. Identification

CHS Inc.
P.O. Box 64089
Mail station 525
St. Paul, MN 55164-0089

Transportation Emergency (CHEMTREC)	:	1-800-424-9300
Technical Information	:	1-651-355-8443
SDS Information	:	1-651-355-8445

Product name	:	METHANOL	**SDS no.**	:	0140-J4X0
Common name	:	Not available.	**Revision date**	:	11/15/2013
Chemical name	:	Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	**Chemical formula**	:	Mixture
Chemical family	:	Not available.			

Relevant identified uses of the substance or mixture and uses advised against

Not available.

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 2
ACUTE TOXICITY: ORAL - Category 3
ACUTE TOXICITY: SKIN - Category 3
ACUTE TOXICITY: INHALATION - Category 3
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Highly flammable liquid and vapor.
Toxic if swallowed, in contact with skin or if inhaled.
Causes damage to organs.

Precautionary statements

Hazardous Material Information System (U.S.A.)	**Health :**	2	*	**Flammability :**	3	**Physical hazards :**	0
National Fire Protection Association (U.S.A.)	**Health :**	2		**Flammability :**	3	**Instability :**	0

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol

Other means of identification : Not available.

Ingredient name	%	CAS number
Methanol	100	67-56-1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Get medical attention. If necessary, call a poison center or physician.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Wash with plenty of soap and water. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 20 minutes. Get medical attention. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : Toxic if inhaled.

Skin contact : Toxic in contact with skin.

Ingestion : Toxic if swallowed.

Over-exposure signs/symptoms

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet or water-based fire extinguishers.

Specific hazards arising from the chemical : Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : No specific data.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Methods and materials for containment and cleaning up

Spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	**ACGIH TLV (United States, 3/2012). Absorbed through skin.** STEL: 328 mg/m³ 15 minutes. STEL: 250 ppm 15 minutes. TWA: 262 mg/m³ 8 hours. TWA: 200 ppm 8 hours. **NIOSH REL (United States, 6/2009). Absorbed through skin.** STEL: 325 mg/m³ 15 minutes. STEL: 250 ppm 15 minutes. TWA: 260 mg/m³ 10 hours. TWA: 200 ppm 10 hours. **OSHA PEL (United States, 6/2010).** TWA: 260 mg/m³ 8 hours. TWA: 200 ppm 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures : Appropriate techniques should be used to remove potentially contaminated clothing. IF ON SKIN (or hair): Wash contaminated clothing before reuse.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Clear.]

Color : Not available.

Odor : Alcohol-like.

Odor threshold : 2000 ppm

pH : 7

Melting point : -97.77°C (-144°F)

Boiling point : 64.5°C (148.1°F)

Flash point : Closed cup: 11°C (51.8°F) [Pensky-Martens.] Open cup: 15.85°C (60.5°F) [Cleveland.]

Flammability : Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge. Flammable in the presence of the following materials or conditions: heat.

Lower and upper explosive (flammable) limits : Lower: 6% Upper: 36%

Relative density : 0.792

Evaporation rate : 2.1 (Butyl acetate = 1)

Solubility : Not available.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : -0.82 to 0.66

Auto-ignition temperature : 464°C (867.2°F)

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not available.

Vapor pressure : 12.8 kPa (96 mm Hg) [room temperature]

Vapor density : 1.11 [Air = 1]

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	LC50 Inhalation Gas.	Rat	145000 ppm	1 hours
	LC50 Inhalation Gas.	Rat	64000 ppm	4 hours
	LD50 Dermal	Rabbit	15800 mg/kg	-
	LD50 Oral	Rat	5600 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 mg	-
	Eyes - Moderate irritant	Rabbit	-	40 mg	-

Sensitization

Skin : There is no data available.

Respiratory : There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

There is no data available.

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	Category 1	Not determined	Not determined

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	Acute EC50 16.912 mg/L Marine water	Algae - Ulva pertusa	96 hours
	Acute EC50 10000000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 2500000 µg/l Marine water	Crustaceans - Crangon crangon - Adult	48 hours
	Acute LC50 100000 µg/l Fresh water	Fish - Pimephales promelas - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
	Chronic NOEC 9.96 mg/L Marine water	Algae - Ulva pertusa	96 hours

Persistence and degradability

There is no data available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	-0.82 to 0.66	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : There is no data available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

DOT IDENTIFICATION NUMBER UN1230 **DOT proper shipping name** METHANOL RQ

DOT Hazard Class(es) 3 (6.1) **PG** II **DOT EMER. RESPONSE GUIDE NO.** 131

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined
United States inventory (TSCA 8b): This material is listed or exempted.

Clean Air Act Section 602 Class I Substances : Not listed
Clean Air Act Section 602 Class II Substances : Not listed
DEA List I Chemicals (Precursor Chemicals) : Not listed
DEA List II Chemicals (Essential Chemicals) : Not listed
Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	60 - 100	Yes.	No.	No.	Yes.	No.

SARA 313 : This product (does/not) contain toxic chemicals subject to the reporting requirements of SARA Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

Product name	CAS number	%
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	67-56-1	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : This material is listed.
New York : This material is listed.
New Jersey : This material is listed.
Pennsylvania : This material is listed.
California Prop. 65 : **WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	No.	Yes.	No.	No.

Section 16. Other information

Revision date : 11/15/2013 **Supersedes** : 03/11/2011

Revised Section(s) : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16. **Prepared by** : KMK Regulatory Services Inc.

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SAFETY DATA SHEET

Section 1. Identification

CHS Inc.
P.O. Box 64089
Mail station 525
St. Paul, MN 55164-0089

Transportation Emergency (CHEMTREC) : 1-800-424-9300
Technical Information : 1-651-355-8443
SDS Information : 1-651-355-8445

Product name	:	METHANOL	**SDS no.**	:	0140-J4X0
Common name	:	Not available.	**Revision date**	:	11/15/2013
Chemical name	:	Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	**Chemical formula**	:	Mixture
Chemical family	:	Not available.			

Relevant identified uses of the substance or mixture and uses advised against

Not available.

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 2
ACUTE TOXICITY: ORAL - Category 3
ACUTE TOXICITY: SKIN - Category 3
ACUTE TOXICITY: INHALATION - Category 3
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Highly flammable liquid and vapor.
Toxic if swallowed, in contact with skin or if inhaled.
Causes damage to organs.

Precautionary statements

Hazardous Material Information System (U.S.A.)	**Health :**	2	*	**Flammability :**	3	**Physical hazards :**	0
National Fire Protection Association (U.S.A.)	**Health :**	2		**Flammability :**	3	**Instability :**	0

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol

Other means of identification : Not available.

Ingredient name	%	CAS number
Methanol	100	67-56-1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Get medical attention. If necessary, call a poison center or physician.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Wash with plenty of soap and water. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 20 minutes. Get medical attention. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : Toxic if inhaled.

Skin contact : Toxic in contact with skin.

Ingestion : Toxic if swallowed.

Over-exposure signs/symptoms

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet or water-based fire extinguishers.

Specific hazards arising from the chemical : Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : No specific data.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Methods and materials for containment and cleaning up

Spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. •Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	**ACGIH TLV (United States, 3/2012). Absorbed through skin.** STEL: 328 mg/m³ 15 minutes. STEL: 250 ppm 15 minutes. TWA: 262 mg/m³ 8 hours. TWA: 200 ppm 8 hours. **NIOSH REL (United States, 6/2009). Absorbed through skin.** STEL: 325 mg/m³ 15 minutes. STEL: 250 ppm 15 minutes. TWA: 260 mg/m³ 10 hours. TWA: 200 ppm 10 hours. **OSHA PEL (United States, 6/2010).** TWA: 260 mg/m³ 8 hours. TWA: 200 ppm 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures : Appropriate techniques should be used to remove potentially contaminated clothing. IF ON SKIN (or hair): Wash contaminated clothing before reuse.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Clear.]

Color : Not available.

Odor : Alcohol-like.

Odor threshold : 2000 ppm

pH : 7

Melting point : -97.77°C (-144°F)

Boiling point : 64.5°C (148.1°F)

Flash point : Closed cup: 11°C (51.8°F) [Pensky-Martens.] Open cup: 15.85°C (60.5°F) [Cleveland.]

Flammability : Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge. Flammable in the presence of the following materials or conditions: heat.

Lower and upper explosive (flammable) limits : Lower: 6% Upper: 36%

Relative density : 0.792

Evaporation rate : 2.1 (Butyl acetate = 1)

Solubility : Not available.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : -0.82 to 0.66

Auto-ignition temperature : 464°C (867.2°F)

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not available.

Vapor pressure : 12.8 kPa (96 mm Hg) [room temperature]

Vapor density : 1.11 [Air = 1]

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	LC50 Inhalation Gas.	Rat	145000 ppm	1 hours
	LC50 Inhalation Gas.	Rat	64000 ppm	4 hours
	LD50 Dermal	Rabbit	15800 mg/kg	-
	LD50 Oral	Rat	5600 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 mg	-
	Eyes - Moderate irritant	Rabbit	-	40 mg	-

Sensitization

Skin : There is no data available.

Respiratory : There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

There is no data available.

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	Category 1	Not determined	Not determined

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	Acute EC50 16.912 mg/L Marine water	Algae - Ulva pertusa	96 hours
	Acute EC50 10000000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 2500000 µg/l Marine water	Crustaceans - Crangon crangon - Adult	48 hours
	Acute LC50 100000 µg/l Fresh water	Fish - Pimephales promelas - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
	Chronic NOEC 9.96 mg/L Marine water	Algae - Ulva pertusa	96 hours

Persistence and degradability

There is no data available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	-0.82 to 0.66	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : There is no data available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

DOT IDENTIFICATION NUMBER UN1230 **DOT proper shipping name** METHANOL RQ

DOT Hazard Class(es) 3 (6.1) **PG** II **DOT EMER. RESPONSE GUIDE NO.** 131

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined
United States Inventory (TSCA 8b): This material is listed or exempted.

Clean Air Act Section 602 Class I Substances : Not listed
Clean Air Act Section 602 Class II Substances : Not listed
DEA List I Chemicals (Precursor Chemicals) : Not listed
DEA List II Chemicals (Essential Chemicals) : Not listed
Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	60 - 100	Yes.	No.	No.	Yes.	No.

SARA 313 : This product (does/not) contain toxic chemicals subject to the reporting requirements of SARA Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

Product name	CAS number	%
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	67-56-1	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : This material is listed.
New York : This material is listed.
New Jersey : This material is listed.
Pennsylvania : This material is listed.
California Prop. 65 : **WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Methanol, Methyl Alcohol, Wood Alcohol, Anhydrous Methyl Alcohol	No.	Yes.	No.	No.

Section 16. Other information

Revision date : 11/15/2013 **Supersedes** : 03/11/2011

Revised Section(s) : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16. **Prepared by** : KMK Regulatory Services Inc.

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Attachment E.4

Additional Results of Effluent Testing

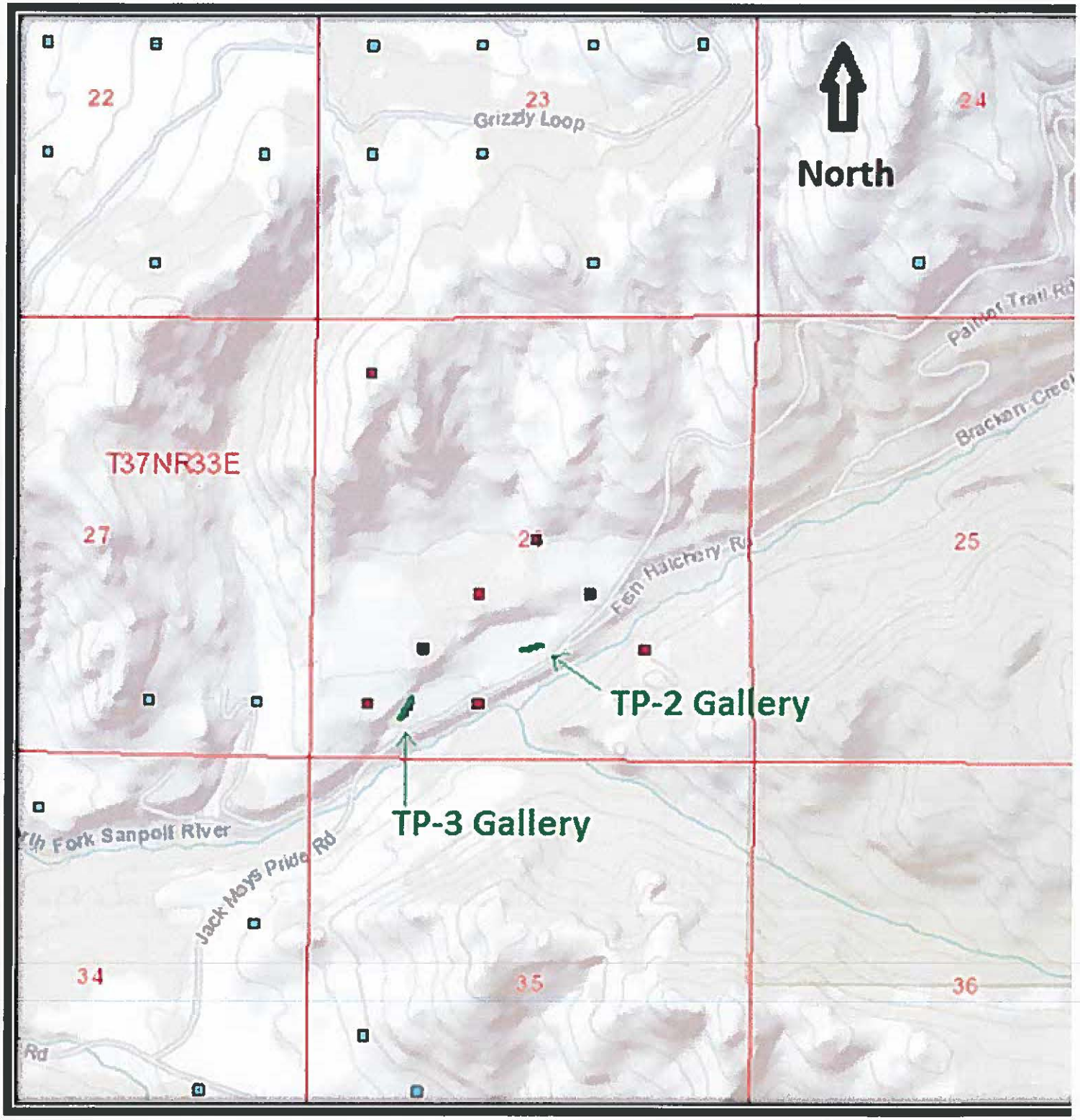
Parameter	Measurement Values			Number of Analyses	Analytical Method	Practical Quantification Level
	Min	Max	Avg			
Carbon, Total Organic as C	2.45	400	161.9	58	SM 5310 B	4 mg/L

Total Organic Carbon as C

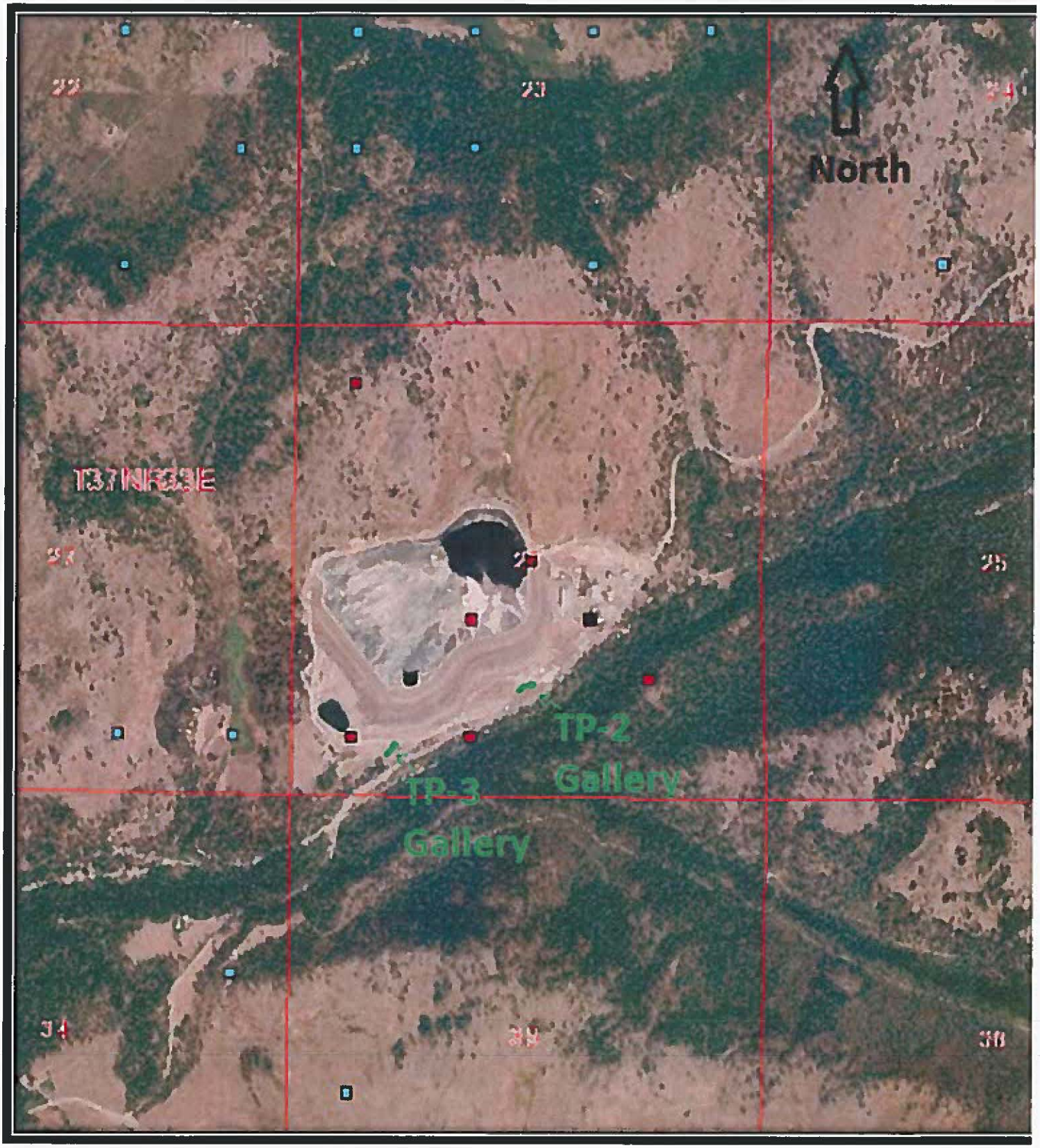
Site Name	Date	Time	Result (mg/L)
UD-OUT	01/11/2018	09:15	56.2
UD-OUT	01/15/2018	10:00	49
UD-OUT	01/22/2018	09:30	2.45
UD-OUT	01/24/2018	10:10	104
UD-OUT	01/26/2018	14:20	87.9
UD-OUT	01/29/2018	08:10	400
UD-OUT	01/31/2018	14:45	328
UD-OUT	02/01/2018	09:40	310
UD-OUT	02/05/2018	09:15	333
UD-OUT	02/12/2018	10:15	278
UD-OUT	02/20/2018	13:20	94.1
UD-OUT	02/26/2018	08:40	353
UD-OUT	03/05/2018	12:05	323
UD-OUT	03/12/2018	10:40	220
UD-OUT	03/19/2018	09:10	245
UD-OUT	03/26/2018	13:45	217
UD-OUT	04/02/2018	10:40	216
UD-OUT	04/09/2018	10:25	56.7
UD-OUT	04/16/2018	10:40	19.8
UD-OUT	04/23/2018	11:25	220
UD-OUT	05/01/2018	11:50	145
UD-OUT	05/07/2018	15:20	21.9
UD-OUT	05/14/2018	09:20	76
UD-OUT	05/22/2018	10:00	3.22
UD-OUT	05/29/2018	10:30	65.9
UD-OUT	06/04/2018	09:10	104
UD-OUT	06/14/2018	08:14	227
UD-OUT	06/18/2018	12:35	177
UD-OUT	06/25/2018	11:08	79.3
UD-OUT	07/03/2018	09:30	130
UD-OUT	07/09/2018	09:40	126
UD-OUT	07/16/2018	08:15	129
UD-OUT	07/23/2018	10:05	233

UD-OUT	07/30/2018	13:15	157
UD-OUT	07/30/2018	14:30	188
UD-OUT	08/06/2018	15:40	161
UD-OUT	08/13/2018	09:10	193
UD-OUT	08/20/2018	08:30	240
UD-OUT	08/23/2018	09:00	193
UD-OUT	08/27/2018	11:45	236
UD-OUT	09/04/2018	09:50	139
UD-OUT	09/10/2018	11:00	113
UD-OUT	09/17/2018	09:00	26.6
UD-OUT	09/24/2018	08:38	20
UD-OUT	10/01/2018	08:30	107
UD-OUT	10/08/2018	14:30	172
UD-OUT	10/15/2018	11:55	155
UD-OUT	10/22/2018	14:15	86
UD-OUT	10/29/2018	14:45	168
UD-OUT	11/05/2018	12:30	184
UD-OUT	11/12/2018	15:00	277
UD-OUT	11/19/2018	16:10	242
UD-OUT	11/26/2018	12:20	229
UD-OUT	12/04/2018	08:40	200
UD-OUT	12/10/2018	08:50	157
UD-OUT	12/17/2018	11:15	97.6
UD-OUT	12/26/2018	08:00	109
UD-OUT	12/31/2018	08:55	109

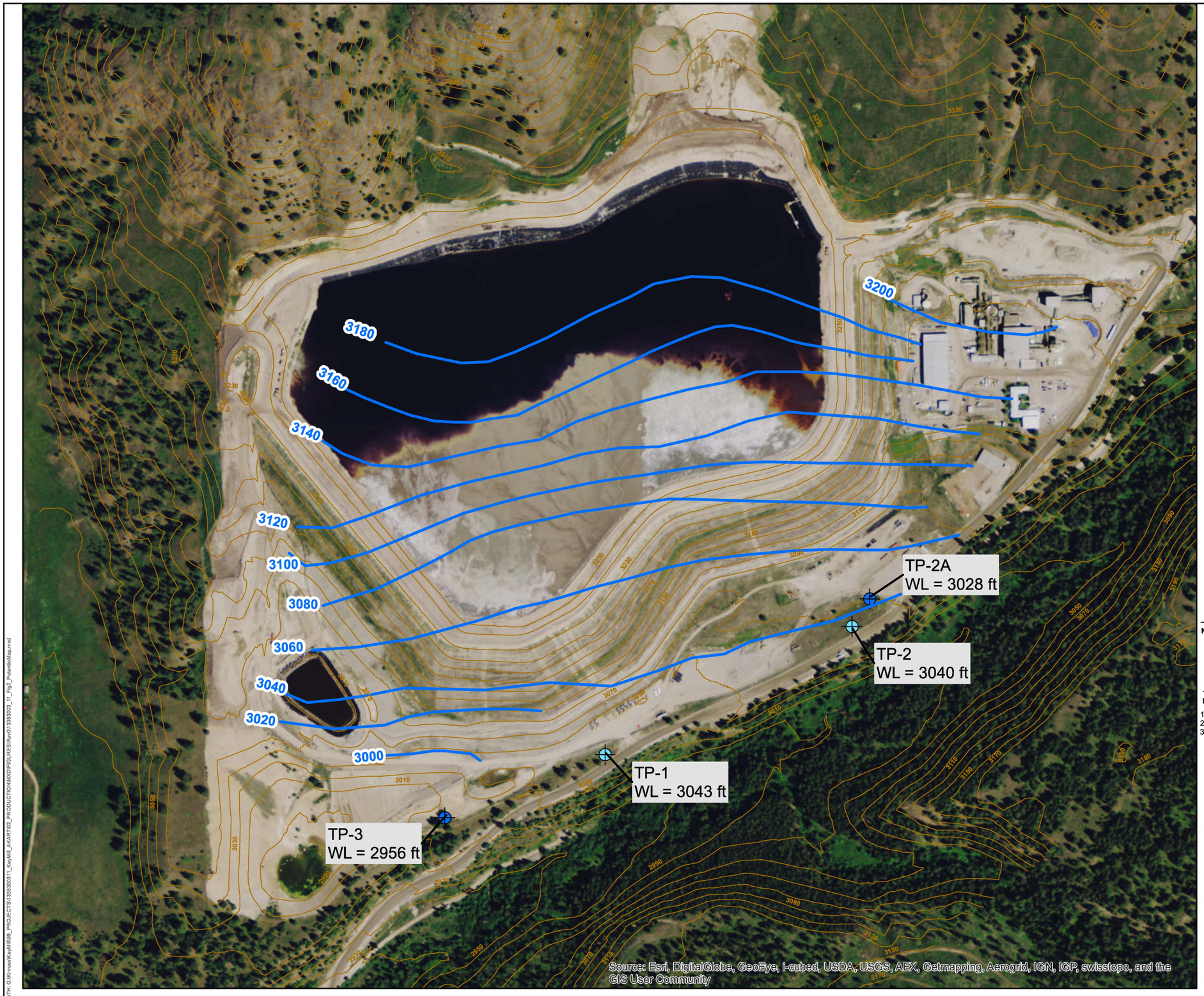
Attachment G.3
USGS Topographical Map and Surrounding Wells Aerial Photograph



Source: https://fortress.wa.gov/ecy/wellconstruction/map/WCLSWebMap/WellConstructionMapSearch.aspx



Source: https://fortress.wa.gov/ecy/wellconstruction/map/WCLSWebMap/WellConstructionMapSearch.aspx



Legend

- Groundwater Elevation Contour (HydroGeo 2005)
- Monitoring Well in Deep Aquifer
- Monitoring Well in Shallow Aquifer
- ExistingSiteTopo_reduced

0 250 500 1,000 Feet

NOTE(S)

1. GROUNDWATER CONTOURS ARE BASED ON BOREHOLE MEASUREMENTS COLLECTED PRIOR TO CONSTRUCTION OF THE TSF, AS INTERPRETED BY HYDROGEO (2005).
2. GROUNDWATER ELEVATIONS IN MONITORING WELLS ARE THE AVERAGE OF THE MEASUREMENTS COLLECTED IN 2015, SHOWN AS FEET ABOVE MEAN SEA LEVEL.

REFERENCE(S)

1. AERIAL - ESRI
2. MONITORING WELLS - ECHO BAY
3. GROUNDWATER CONTOURS - HYDROGEO (2005) AND GOLDER

CLIENT
ECHO BAY MINERALS

PROJECT
KEY MILL AKART

TITLE
INTERPRETED GROUNDWATER ELEVATION CONTOURS

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-05-14
DESIGNED	JHP
PREPARED	JHP
REVIEWED	####
APPROVED	####

PROJECT NO.	CONTROL	REV.	FIGURE
133-93011-11	004	0	**2-6**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: G:\Kitimat\Key\Mill\99_PROJECTS\13393093011_KeyMill_AKART\02_PRODUCTION\MXD\FIGURES\Rev01\13393093_11_Fig2_PotentialMap.mxd