EXHIBIT B

Wyoming Pollutant Discharge Elimination System (WYPDES)

Department of Environmental Quality
Application for Permit to Discharge Wastewater for:

Industrial operations, Form G
Revised 27AUG2020

Date Received

Please print or type. Submission of illegible application materials will result in application processing delays. All items must be completed accurately and in their entirety or the application will be deemed incomplete and processing delayed or your application returned. If a table or provided space is insufficient for your response, please attach your response on a different page, and note in the space provided that the information is provided in attachment XX. An original applicant signature is required. Faxes will not be accepted.

1. Check the box corresponding to application type:

- ☐ New
- ☑ Renewal
- ☐ Major modification

Permit number WY0001163 Expiration Date: July 31, 2023

2. General Facility Location: Township(s) 45N, 44N Range(s) 61W

Facility Street address if applicable: 10 Stampede Street, Newcastle, WY 82701

4. Receiving Waters Windmill Draw (unclassified) and Little Oil Creek (3B), Cheyenne River Basin

5. Name of the facility producing the discharge (note: this is the facility name that will appear in your permit.)

Wyoming Refining Company

6. Standard Industrial Classification code (SIC Code) 2911 and primary industrial category from Appendix B, Table II (If Applicable): Petroleum Refining.

7. Contact information – complete **Table A.**

Table A: Permittee Contact Information	
Permittee Contact Name Terese Hruska, Environmental Engineer	*Consultant Contact Name*
Company Name Wyoming Refining Company	*Company Name*
Mailing Address 10 Stampede Street	*Mailing Address*
City, State, and Zip Code Newcastle, WY 82701	*City, State, and Zip Code*
Permittee Telephone Number (307) 363-0865	*Consultant Telephone Number*

Table A: Permittee Contact Information	
Permittee E-Mail Address thruska@parpacific.com	*Consultant E-Mail Address*
Permittee Contact Preference: E-Mail	*Consultant Contact Preference:*

8. Applicant Status: (select at least one) ☐ Federal ☐ State ☑ Private ☐ Public ☐ Other

(if 'other', describe)

_____.

(Select at least one): ☑ Owner ☑ Operator

9. Outfall and monitoring point locations. Complete Table B for each outfall/monitoring point.

Table B: Outfall Locations

Outfall #	Qtr/Qtr	Section	Town-ship	Range	Latitude*	Longitude*	Immediate Receiving Stream	Mainstem (closest perennial water)**	County
Example	NENE	11	13 North	67 West	41.116009	-104.85185	Clear Creek	Crow Creek	Laramie
001	#								
002	#								
003									
004									
005									

See attached supplemental information

*Latitude-Longitude coordinates shall be provided in NAD 83 decimal degree format, accurate to a minimum of 5 decimal places.

**Nearest continually-flowing water that your immediate receiving stream confluences.

10. A. Provide a brief description of the business conducted at this facility, and the principal products or services it provides.

See attached Supplemental Information

B. Does this facility use cooling water? ☑ Yes ☐ No

If yes, where does the cooling water come from and how much is used on a typical day?

See attached Supplemental Information

11. Complete **Table C** for each existing or proposed outfall at this facility.

Table C: Outfall Descriptions						
Outfall #	**Final Treatment Unit**	**Wastewater Source #1**	**Wastewater Source #2**	**Wastewater Source #3**	**Choose one Description* for Each Outfall:**	**Treatment Used****
Example Outfall	Bottom ash settling pond 001	Bottom ash runoff	Floor drain runoff	Metal cleaning wastes	Continuous	1-U, 4-A
001	#					
002	#					
003						
004						
005						

See attached Supplemental Information

*Enter at least one of the following descriptors for each outfall: Continuous Discharge, Intermittent Discharge, Seasonal Discharge, No Discharge.

**Either describe narratively or use wastewater treatment codes provided below. Include all applicable treatments.

Wastewater Treatment Codes

PHYSICAL TREATMENT PROCESSES

1–A. . . . . Ammonia Stripping
1–B . . . . . Dialysis
1–C . . . . . Diatomaceous Earth Filtration
1–D . . . . . Distillation
1–E . . . . . Electrodialysis
1–F . . . . . Evaporation
1–G . . . . . Flocculation
1–H . . . . . Flotation
1–I . . . . . Foam Fractionation
1–J . . . . . Freezing
1–K . . . . . Gas–Phase Separation
1–L . . . . . Grinding (*Comminutors*)
1–M . . . . . Grit Removal
1–N . . . . . Microstraining
1–O . . . . . Mixing
1–P . . . . . Moving Bed Filters
1–Q. . . . . Multimedia Filtration
1–R . . . . . Rapid Sand Filtration
1–S . . . . . Reverse Osmosis (*Hyperfiltration*)
1–T . . . . . Screening
1–U . . . . . Sedimentation (*Settling*)
1–V . . . . . Slow Sand Filtration
1–W . . . . . Solvent Extraction
1–X . . . . . Sorption

CHEMICAL TREATMENT PROCESSES

2–A . . . . . Carbon Adsorption
2–B . . . . . Chemical Oxidation
2–C . . . . . Chemical Precipitation
2–D . . . . . Coagulation
2–E . . . . . Dechlorination
2–F . . . . . Disinfection (*Chlorine*)
2–G . . . . . Disinfection (*Ozone*)
2–H . . . . . Disinfection (*Other*)
2–I . . . . . Electrochemical Treatment
2–J . . . . . Ion Exchange
2–K . . . . . Neutralization
2–L . . . . . Reduction

BIOLOGICAL TREATMENT PROCESSES

3–A . . . . . Activated Sludge
3–B . . . . . Aerated Lagoons
3–C . . . . . Anaerobic Treatment
3–D . . . . . Nitrification–Denitrification
3–E . . . . . Pre-Aeration
3–F . . . . . Spray Irrigation/Land Application
3–G . . . . . Stabilization Ponds
3–H . . . . . Trickling Filtration

OTHER PROCESSES

4–A . . . . . Discharge to Surface Water
4–B . . . . . Ocean Discharge Through Outfall
4–C . . . . . Reuse/Recycle of Treated Effluent
4-D . . . . . Underground Injection

SLUDGE TREATMENT AND DISPOSAL PROCESSES

5–A . . . . . Aerobic Digestion
5–B . . . . . Anaerobic Digestion
5–C. . . . . Belt Filtration
5–D. . . . . Centrifugation
5–M . . . . . Heat Drying
5–N . . . . . Heat Treatment
5–O . . . . . Incineration
5–P . . . . . Land Application

5–E . . . . . Chemical Conditioning
5–F . . . . . Chlorine Treatment
5–G . . . . . Composting
5–H . . . . . Drying Beds
5–I. . . . . Elutriation
5–J . . . . . Flotation Thickening
5–K . . . . . Freezing
5–L . . . . . Gravity Thickening
5–Q . . . . . Landfill
5–R . . . . . Pressure Filtration
5–S . . . . . Pyrolysis
5–T . . . . . Sludge Lagoons
5–U . . . . . Vacuum Filtration
5–V . . . . . Vibration
5–W . . . . . Wet Oxidation

12. Provide a brief description of this facility's ultimate disposal method for any solid or liquid wastes other than by outfall discharge. Include applicable permit numbers.

See attached Supplemental Information

13. **For new facilities**, expected discharge commencement date. N/A

For existing facilities, attach actual flow data from each outfall for the last six months, and complete **Table D.**

Is/Will discharge be (check one) ☑ continuous or ☑ intermittent?

Table D: Outfall Discharge Rates*

For all Outfalls	For Continuously Discharging Outfalls Only	For Intermittently-Discharging or Seasonally-Discharging Outfalls Only			
Outfall #	Average Daily Discharge Volume (MGD)*	# of Times per Year Discharges Occur	Anticipated Discharge Duration, Each Occurrence (days)	Anticipated Discharge Flow Volume, Each Occurrence (MGD)	Months that Discharge is Expected to Occur.
Example		4	5 days	0.15 MGD	March, June, October, December
001	0.078 MGD				Continuous#
002		17 on Avg*	1 day	0.422 MGD	April to October
003					
004					
005					

* Depends on the amount of precipitation received during the year; # Outfall freezes over during the winter months

14. If requesting permit modifications, describe below, and complete **Table E.**

Remove Outfall 003 - not used since Sept. 2011 and no plans to ever use it again.

Remove Outfall 004 - has not been constructed and no plans to construct it exist.

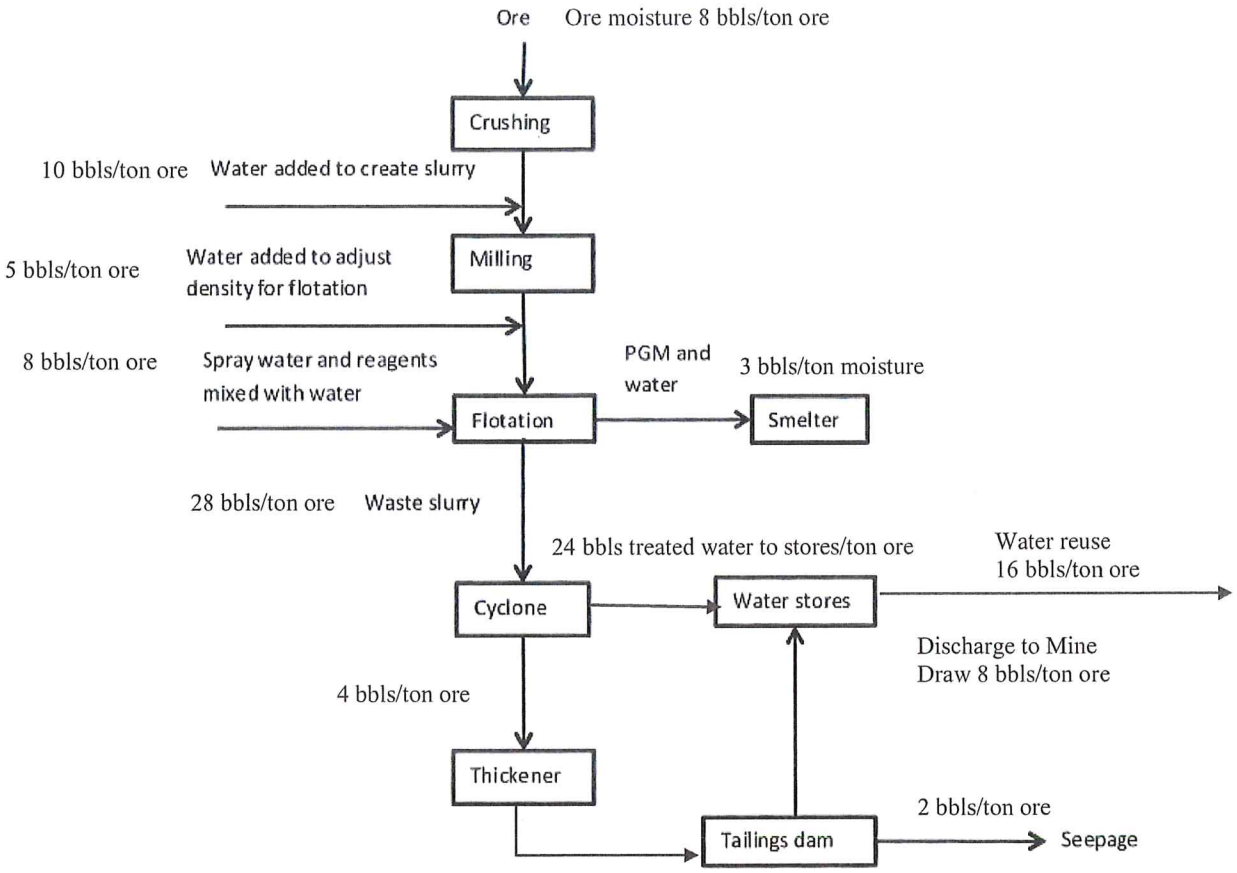
Table E: Modification Information. Fill in a separate line for each requested modification.				
Modification	**Construction Start Date**	**Construction Completion Date**	**Discharge Commencement Date**	**Operational Level**
Remove Outfall 003 from permit	N/A	N/A	N/A	N/A
Remove Outfall 004 from permit	N/A	N/A	N/A	N/A

15. Landowner and Leaseholder Information. If the property where this facility's outfalls are located is not owned by the applicant, complete **Table G,** listing each landowner and/or lessee that owns property within this facility's project area.

Table G: Landowner and Lessee Information:	
Landowner #1 Name Thomas R. Wright	*Landowner #2 Name* Thomas J. Farnsworth
Mailing Address 1329 Morrisey Road	*Mailing Address* 23315 N US Hwy 85
City, State, and Zip Code Newcastle, WY 82701	*City, State, and Zip Code* Newcastle, WY 82701
Landowner #3 Name	*Landowner #4 Name*
Mailing Address	*Mailing Address*
City, State, and Zip Code	*City, State, and Zip Code*

16. Attach a line drawing or diagram that shows water flow and balance throughout the facility. Show approximate average intake, treatment unit, stormwater, and discharge flows. If unable to provide a water balance, attach a pictorial representation of the nature and amounts supplied by all water sources and collection and treatment measures. If requesting modifications due to changes in facility water treatment and/or production changes, provide both a 'before' and an 'after' diagram. See the following example:

See attached Supplemental Information - Figure 1



17. Complete **Table F** by listing all water treatment chemicals used at this facility, including, but not limited to: flocculants, anti-scalants, anti-corrosives, pH and/or hardness adjusters, disinfectants, biofouling agents, and/or catalytic agents. Attach copies of MSDS sheets for all water treatment chemicals listed.

See Supplemental Information

Table F: Water Treatment Chemicals

Chemical Name	Manufacturer	Purpose	Average Quantities Used

18. A. Are you required to meet any Federal, State, or local implementation schedules (enforcement order, compliance schedules, administrative orders, stipulations, court orders, or grant or loan conditions) for construction, upgrade or wastewater treatment equipment operation or practice, or any other environmental programs that may affect the discharges described in this application? If so, complete **Table G.** No

B. Are any variances under 40 CFR 122.21(m)? ☐ Yes ☑ No
If yes, describe:

N/A

Table G: Improvements and Implementation Schedules					
Affected Outfalls		Condition, Agreement, etc.	Brief Project Description	Final Compliance Dates	
Outfall #	Discharge Source			Required	Projected
N/A					

19. Facility Map: Attach a description and a clear, legible, detailed topographic map of the facility extending one mile beyond the facility's property boundary in all directions. Include all of the following items:
    a. A legend.
    b. Well locations where facility fluids are injected underground.
    c. Retention ponds.
    d. Each intake site.
    e. Discharge points (outfalls).
    f. Monitoring and/or compliance points.
    g. Hazardous waste treatment, storage, and disposal facilities.
    h. Receiving streams.
    i. Section, township, and range information.
    j. Wells, springs, surface water bodies, drinking water wells, and/or surface water intake structures listed in public records or otherwise known to exist in the map area by the applicant.
    k. Treatment facility locations.
    l. Access routes WDEQ employees can legally use to access the facility and all permitted outfalls and monitoring and/or compliance points.
    m. North arrow.

Please note that maps may be printed at any size necessary to obtain legibility, applicants are not limited to standard paper sheet sizes. See attached Supplemental Information - Figures 2 and 2a

20. Describe control measures that shall be implemented to prevent significant damage to or erosion of the receiving stream channel at the point of discharge.

Water overflows the Windmill Draw Impoundment through a T-siphon onto rip-rap at the dam face overflow. It then travels approximately 3100 ft. through wetlands to Outfall 001. Outfall 002 discharges to rip rap.

21. a. Does an effluent limit guideline apply to this facility as per Section 306 of the Clean Water Act? (for example, metal finishing, fertilizer manufacturing, petroleum refining, cheese making).

☑ Yes (complete **item 21.b)** ☐ No (proceed to item #22.)

b. Are the ELG limitations applicable to this facility expressed in terms of production or other measure of operation? (for example, per tons of feedstock, or per 1000 units of production).

☑ Yes (complete **Table H.)** ☐ No (proceed to item #22.)

Table H: Production-Based Limitations			
Affected Outfall #	**Quantity per Day***	**Unit of Measure**	**Specific Operation, Product, or Materials.**
001	20,000	barrels per day	per 1,000 bbls Refinery (Crude Oil) Feedstock

*For existing facilities, provide a measure of actual production. For new facilities, provide a reasonable estimate of expected production. Provide a rationale as to the figures provided.

The refinery is permitted to process 20,000 bbls/day of crude oil (annual average). The refinery typically processes 14,300 to 19,300 bbls/day during normal operations depending upon market conditions.

22. Provide a list of all toxic pollutants currently used at this facility and/or all toxic pollutants currently being manufactured at this facility as final or intermediate products or byproducts.

See attached Supplemental Information

23. Effluent characterization –
    a. All applicants shall submit effluent water quality results for all constituents listed in **Table I**. Attach copies of the laboratory reports used to complete **Table I-1.** If submitting an application for a new facility, estimated daily maximum constituent concentrations shall be provided.

    b. All applicants shall complete Table I-2 by circling or highlighting each constituent you believe or know to be present in your facility's effluent. For all constituents known or believed to be present in your facility's effluent, provide a brief rationale as to why the constituent is known or believed to be present in your facility's effluent, and provide at least one water quality analysis for each constituent. If submitting an application for a new facility, estimated daily maximum constituent concentrations shall be provided.

Table I-1: Effluent Water Quality Results See Supplemental Information for Outfalls 001 and 002

Constituent and Required Reporting Units	Result (Measured Value)*	Laboratory Test Method Used	Practical Quantitation Level Achieved by Lab
5-Day Biochemical Oxygen Demand (BOD_5), mg/L			
Chemical Oxygen Demand (COD), mg/L			
Total Organic Carbon (TOC), mg/L			
Total Suspended Solids (TSS), mg/L			
Ammonia (as N), mg/L			

Table I-1: Effluent Water Quality Results See Supplemental Information for Outfalls 001 and 002

Constituent and Required Reporting Units	Constituent and Required Reporting Units	Constituent and Required Reporting Units	Constituent and Required Reporting Units
Temperature (°C) (field measurement)			
pH, standard units (field measurement)			
Discharge color (describe)			

*Existing water quality data may be used provided the data was collected within the last 4.5 years, all representative data are used, the data is representative of effluent water quality, and all sampling and analytical protocols are met.

Table I-2: TOXIC AND HAZARDOUS SUBSTANCES (Circle or highlight all constituent(s) below you believe to be present in this facility's effluent) See Supplemental Information for Outfalls 001 and 002

Asbestos	Diethyl amine Napthenic acid	Naled
Acetaldehyde	Dintrobenzene	Nitrotoluene
Allyl alcohol	Diquat	Parathion
Allyl chloride	Disulfoton	Phenolsulfonate
Amyl acetate	Diuron	Phosgene
Aniline	Epichlorohydrin	Propargite
Asbestos	Ethion	Propylene oxide
Benzonitrile	Ethylene diamine	Pyrethrins
Benzyl chloride	Ethylene dibromide	Quinoline
Butyl acetate	Formaldehyde	Resorcinol
Butylamine	Furfural	Strontium
Captan	Guthion	Strychnine
Carbaryl	Dimethyl amine	Styrene
Carbofuran	Isoprene	TDE (Tetrachlorodiphenyl ethane)
Carbon disulfide	Isopropanolamine	Trichlorofon
Chlorpyrifos	Kelthane	2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
Coumaphos	Kepone	2,4,5-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]
Cresol	Malathion	Triethanolamine
Crotonaldehyde	Mercaptodimethur	Triethylamine
Cyclohexane	Methoxychlor	Trimethylamine
Diazinon	Methyl mercaptan	Uranium
Dicamba	Methyl methacrylate	Vanadium
Dichlobenil	Methyl parathion	Vinyl acetate

Table I-2: TOXIC AND HAZARDOUS SUBSTANCES (Circle or highlight all constituent(s) below you believe to be present in this facility's effluent) See Supplemental Information for Outfalls 001 and 002		
Dichlone	Mevinphos	Xylene
2,4-D (2,4-Dichlorophenoxyacetic acid)	Mexacarbate	Xylenol
2,2-Dichloropropionic acid	Monoethyl amine	
Dichlorvos	Monomethyl amine	

24. a. Is this facility classified as a **primary industry?** (Refer to **Table J-1).**

☑ Yes (complete **the remainder of item 24))** ☐ No (proceed to item 25.)

Which primary industry applies at this facility? Petroleum Refining

Table J-1: Primary Industrial Category Identification and Effluent Testing Requirements.					
	Effluent Testing Fractions				
PRIMARY INDUSTRIAL CATEGORY	Volatile: See Table J-2 for constituent list.	Acid: See Table J-3 for constituent list	Base/Neutral: See Table J-4 for constituent list	Pesticides: See Table J-5 for constituent list	Metals, Cyanide, and Total Phenols: See Table J-6 for constituent list
Adhesives and Sealants.....	X	X	X	NR	X
Aluminum Forming.....	X	X	X	NR	X
Auto and Other Laundries.....	X	X	X	X	X
Battery Manufacturing.....	X	NR	X	NR	X
Coal Mining.....	NR	NR	NR	NR	X
Coil Coating.....	X	X	X	NR	X
Copper Forming.....	X	X	X	NR	X
Electric and Electronic Components	X	X	X	X	X
Electroplating.....	X	X	X	NR	X
Explosives Manufacturing.....	NR	X	X	NR	X
Foundries.....	X	X	X	NR	X
Gum and Wood Chemicals[1].....	X	X	X[1]	NR	X
Inorganic Chemicals Manufacturing	X	X	X	NR	X
Iron and Steel Manufacturing.....	X	X	X	NR	X
Leather Tanning and Finishing....	X	X	X	NR	X
Mechanical Products Manufacturing	X	X	X	NR	X
Nonferrous Metals Manufacturing..	X	X	X	X	X
Ore Mining[2].....	X	X[2]	X	X	X
Organic Chemicals Manufacturing..	X	X	X	X	X
Paint and Ink Formulation.....	X	X	X	NR	X
Pesticides.....	X	X	X	X	X
Petroleum Refining.....	X	NR	NR	NR	X
Pharmaceutical Preparations.....	X	X	X	NR	X
Photographic Equipment and Supplies.....	X	X	X	NR	X

Table J-1: Primary Industrial Category Identification and Effluent Testing Requirements.					
	Effluent Testing Fractions				
PRIMARY INDUSTRIAL CATEGORY	Volatile: See Table J-2 for constituent list.	Acid: See Table J-3 for constituent list	Base/Neutral: See Table J-4 for constituent list	Pesticides: See Table J-5 for constituent list	Metals, Cyanide, and Total Phenols: See Table J-6 for constituent list
Plastic and Synthetic Materials Manufacturing.....	X	X	X	X	X
Plastic Processing.....	X	NR	NR	NR	X
Porcelain Enameling.....	NR	NR	NR	NR	X
Printing and Publishing.....	X	X	X	X	X
Pulp and Paper Mills.....(see individual subcategories)	X	X	X	X	X
Rubber Processing.....	X	X	X	NR	X
Soap and Detergent Manufacturing.	X	X	X	NR	X
Steam Electric Power Plants.....	X	X	NR	NR	X
Textile Mills..... (SubPart C Greige Mills exempt)	X	X	X	NR	X
Timber Products Processing.....	X	X	X	X	X

b. All applicants requesting WYPDES permit coverage for a facility identified as a 'Primary Industry' in **Table J-1** shall submit effluent samples for all fraction constituents identified in **Table J-1 (see Tables J-2 through J-6)**. Separate sample results shall be submitted for each outfall with the potential to discharge process wastewater. For instance, an application for steam electric power plant discharges shall contain laboratory sample results for all constituents listed in the Volatile, Acid, and Metals, Cyanide and Total Phenols fractions, **(Tables J-2, J-3,** and **J-6)** but is not required to submit sample results for the Base/Neutral or Pesticides fractions. **(Tables J-4 and J-5)**. If submitting an application for a new facility, estimated daily maximum constituent concentrations shall be provided.

Decisions regarding whether or not a constituent may be present in the facility's effluent shall consider:

1. Does the facility use a feedstock that contains this constituent?
2. Does the facility use maintenance chemicals that contain this constituent?
3. Does the facility produce an intermediate or final product that contains this constituent?
4. Does the facility produce this constituent as intermediate or final byproduct?
5. Has this constituent been detected in previous water quality sampling?
6. Does this facility's in-house or contractor's engineering reports or studies indicate that this constituent could be produced in any way at this facility?
7. Does the facility's intake water contain this constituent?

Table J-2: VOLATILE COMPOUNDS FRACTION (mark with an 'X') See Supplemental Information				
Constituent	Required Testing	Believed Absent	Believed Present	Water Sample Result (if required)
acrolein				
acrylonitrile				
benzene				
bromoform				
carbon tetrachloride				
chlorobenzene				

Table J-2: VOLATILE COMPOUNDS FRACTION (mark with an 'X')				See Supplemental Information
Constituent	**Required Testing**	**Believed Absent**	**Believed Present**	**Water Sample Result (if required)**
chlorodibromomethane				
chloroethane				
2-chloroethylvinyl ether				
chloroform				
dichlorobromomethane				
1,1-dichloroethane				
1,2-dichloroethane				
1,1-dichloroethylene				
1,2-dichloropropane				
1,3-dichloropropylene				
ethylbenzene				
methyl bromide				
methyl chloride				
methylene chloride				
1,1,2,2-tetrachloroethane				
tetrachloroethylene				
toluene				
1,2-trans-dichloroethylene				
1,1,1-trichloroethane				
1,1,2-trichloroethane				
trichloroethylene				
vinyl chloride				

Table J-3: ACID COMPOUNDS (mark with an 'X')				N/A
Constituent	Required Testing	Believed Absent	Believed Present	Water Quality Results
2-chlorophenol				
2,4-dichlorophenol				
2,4-dimethylphenol				
4,6-dinitro-o-cresol				
2,4-dinitrophenol				
2-nitrophenol				

Table J-3: ACID COMPOUNDS (mark with an 'X')				N/A
Constituent	Required Testing	Believed Absent	Believed Present	Water Quality Results
4-nitrophenol				
p-chloro-m-cresol				
pentachlorophenol				
phenol				
2,4,6-trichlorophenol				

Table J-4: BASE/NEUTRAL COMPOUNDS (mark with an 'X')				N/A
Constituent	**Required Testing**	**Believed Absent**	**Believed Present**	**Water Sample Results (if required)**
acenaphthene				
acenaphthylene				
anthracene				
benzidine				
benzo(a)anthracene				
benzo(a)pyrene				
3,4-benzofluoranthene				
benzo(ghi)perylene				
benzo(k)fluoranthene				
bis (*2-Chloroethoxy*) methane				
bis(2-chloroethyl)ether				
bis(2-chloroisopropyl)ether				
bis (2-ethylhexyl)phthalate				
4-bromophenyl phenyl ether				
butylbenzyl phthalate				
2-chloronaphthalene				
4-chlorophenyl phenyl ether				
chrysene				
dibenzo(a,h)anthracene				
1,2-dichlorobenzene				
1,3-dichlorobenzene				
1,4-dichlorobenzene				
3,3'-dichlorobenzidine				
diethyl phthalate				
dimethyl phthalate				

Table J-4: BASE/NEUTRAL COMPOUNDS (mark with an 'X') N/A				
Constituent	**Required Testing**	**Believed Absent**	**Believed Present**	**Water Sample Results (if required)**
di-n-butyl phthalate				
2,4-dinitrotoluene				
2,6-dinitrotoluene				
di-n-octyl phthalate				
1,2-Diphenylhydrazine (as Azobenzene)				
fluoranthene (206				
fluorene				
hexachlorobenzene				
hexachlorobutadiene				
hexachlorocyclopentadiene				
hexachloroethane				
indeno				
isophorone				
naphthalene				
nitrobenzene				
n-nitrosodimethylamine				
n-nitrosodi-n-propylamine				
n-nitrosodiphenylamine				
phenanthrene				
pyrene				
1,2,4-tri-chlorobenzene				

Table J-5-PESTICIDE COMPOUNDS (Mark with an 'X') N/A				
Constituent	**Required Testing**	**Believed Absent**	**Believed Present**	**Water Sample Results**
aldrin				
alpha-BHC				
beta-BHC				
gamma-BHC				
delta-BHC				
chlordane				
4,4'-DDT				
4,4'-DDE				

Table J-5-PESTICIDE COMPOUNDS (Mark with an 'X')			N/A	
Constituent	**Required Testing**	**Believed Absent**	**Believed Present**	**Water Sample Results**
4,4'-DDD				
dieldrin				
alpha-endosulfan				
beta-endosulfan				
endosulfan sulfate				
endrin				
endrin aldehyde				
heptachlor				
heptachlor epoxide				
PCB-1242				
PCB-1254				
PCB-1221				
PCB-1232				
PCB-1248				
PCB-1260				
PCB-1016				
toxaphene				

Table J-6—Metals, Cyanide, Total Phenols, Hardness, and Byproducts. (Mark with an "X")				
See Supplemental Information **Constituent**	**Required Testing**	**Believed Absent**	**Believed Present**	**Water Sample Results**
Antimony, Total Recoverable				
Arsenic, Dissolved				
Beryllium, Total Recoverable				
Cadmium, Dissolved				
Chromium, Dissolved				
Copper, Dissolved				
Cyanide, Dissolved				
Hardness (as CaCO3), Total				
Lead, Dissolved				
Mercury, Dissolved				
Nickel, Dissolved				

Table J-6—Metals, Cyanide, Total Phenols, Hardness, and Byproducts. (Mark with an "X")				
Constituent	**Required Testing**	**Believed Absent**	**Believed Present**	**Water Sample Results**
Phenols, Total Recoverable				
Selenium, Total Recoverable				
Silver, Dissolved				
Thallium, Total Recoverable				
Zinc, Dissolved				
Dioxin				
2,3,7,8-Tetra-Chlorodibenzo-P-Bioxin				

c. All applicants requesting WYPDES permit coverage for a facility identified as a 'Primary Industry' in **Table J-1** shall complete **Table J-7** by marking an 'X' in the column labelled 'Believed Present' for each constituent known or believed to be present in this facility's effluent. Mark an 'X' in the column labelled 'Believed Absent' for each constituent you know or have reason to believe is absent in this facility's effluent. If a federal Effluent Guideline (ELG) applies to this facility, the applicant shall submit qualitative data for each constituent limited in the applicable ELG. For all constituents believed present in the effluent but without ELG limitations, the permittee shall either report qualitative data or provide a rationale as to why this constituent is believed to be present in the facility's discharge. If submitting an application for a new facility, estimated daily maximum constituent concentrations shall be provided.

TABLE J-7: Conventional and Nonconventional Pollutants. (Mark with an 'X')			
Constituent	**Believed Absent**	**Believed Present**	**Water Sample Results**
Bromide			
Chlorine, Total Residual			
E. coli			
Fluoride			
Nitrate-Nitrite			
Nitrogen, Total Organic			
Oil and Grease			
Phosphorus	See Supplemental Inf		
Radioactivity			
Alpha, Total			
Beta, Total			
Radium, Total Recoverable			
Radium 226, Total Recoverable			
Sulfate			

TABLE J-7: Conventional and Nonconventional Pollutants. (Mark with an 'X')			
Constituent	**Believed Absent**	**Believed Present**	**Water Sample Results**
Sulfide			
Sulfite	See Supplemental Inf		
Surfactants			
Aluminum, Dissolved			
Barium, Total Recoverable			
Boron			
Cobalt			
Iron, Dissolved			
Magnesium, Dissolved			
Molybdenum			
Manganese, Dissolved			
Tin			
Titanium			

26. Secondary Industries – If your facility does not fit into any category listed in Table J-1, your facility is classified as a secondary industry. All applicants for secondary industry facility surface discharges shall:
N/A

a. In Tables J-2 through J-7, mark each constituent with an 'X' as either being 'Believed Present' or 'Believed Absent'.

b. For all constituents marked 'Believed Present', at least one water quality analysis shall be submitted for that constituent if you believe that the constituent is or will be discharged in quantities equal to or greater than 10 ppb (µg/L). If submitting an application for a new facility, estimated daily maximum constituent concentrations shall be provided.

c. If you mark 'Believed Present' for any of the following constituents and believe that this constituent is or will be discharged in concentrations equal to or greater than 100 ppb (µg/L), at least one water quality analyses shall be submitted for that constituent. If submitting an application for a new facility, estimated daily maximum constituent concentrations shall be provided.

   i. Acrolein
   ii. Acrylonitrile
   iii. 2,4 Dinitrophenol
   iv. 2-Methyl-4, 6 Dinitrophenol

d. For all other constituents marked 'Believed Present', either submit at least one water quality analysis for this constituent, or provide a rationale describing why you believe this constituent is present in this facility's effluent.

e. Decisions regarding whether or not a constituent may be present in the facility's effluent shall consider:

   i. Does the facility use a feedstock that contains this constituent?
   ii. Does the facility use maintenance chemicals that contain this constituent?

iii. Does the facility produce an intermediate or final product that contains this constituent?
iv. Does the facility produce this constituent as intermediate or final byproduct?
v. Has this constituent been detected in previous water quality sampling?
vi. Does this facility's in-house or contractor's engineering reports or studies indicate that this constituent could be produced in any way at this facility?
vii. Does the facility's intake or recycled water contain this constituent?

f. If this facility's industry has a Federal Effluent Limit Guideline (ELG), at least one water quality analysis shall be submitted for each constituent limited in the ELG. If submitting an application for a new facility, estimated daily maximum constituent concentrations shall be provided.

27. If any technical evaluations exist concerning wastewater treatments utilized at this facility, the permittee shall provide copies of the technical evaluations as attachments.

Please see attachment to Supplemental Information "Technical Evaluation of ABTU Diffused Aeration System"

28. Have any biological tests for acute and/or chronic toxicity have been conducted on this facility's effluent within the last three years?

☐ Yes ☑ No (proceed to item 29.)

If yes, attach copies of the laboratory reports.

29. Does this facility:

a. Use or manufacture any of the following: (check all that apply)

None

☐ (i). 2,4,5-trichlorophenoxy acetic acid
☐ (ii). 2-(2,4,5-trichlorophenoxy) propranoic acid
☐ (iii). Silvex (2,4,5,-TP)
☐ (iv). 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon)
☐ (v). 0,0-dimenthyl 0-(2,4,5-trichlorphenyl) phosphorothioate
☐ (vi). 2,4,5-trichlorophenol (TCP)
☐ (vii). Hexachlorophene (HCP)

b. If any constituent listed in i-vii. above is checked, the permittee shall submit qualitative data (laboratory analyses) generated using a screening procedure not calibrated with analytical standards for 2,3,7,8-tetachlorodibenzo-p-dioxin (TCDD). If applying for a new facility, the permittee shall report if any of the constituents listed in i-vii above will be used or manufactured at the facility or if there is reason to believe that TCDD may be present in the facility's effluent, and provide an estimate of effluent TCDD concentrations.

N/A

c. Have effluent known or believed to contain 2,3,7,8-tetachlorodibenzo-p-dioxin (TCCD)?

☐ Yes ☑ No

30. For WYPDES permit renewals or modifications, has this facility ever exceeded permit limitations or water quality standards?

☑ Yes ☐ No

If yes, answer the following:

a. Which constituents?

b.

See Supplemental Information

c. Has the exceedance been addressed? See Supplemental Information

☐ Yes (answer item 30.d.) ☐ No (proceed to item 31)

d. Describe how the exceedance(s) was/were addressed.

See Supplemental Information

31. a. Has the facility ever discharged?

☑ Yes ☐ No

b. If no, has the facility been constructed?

N/A

☐ Yes ☑ No

32. Optional Information: Any optional information you wish to have considered.

33. **Signature**

Authorized application signatories are as follows:	
For corporations:	*A principal executive officer of at least the level of vice president, or the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the overall operation of the facility where the discharge originates.*
For partnerships:	*A general partner.*
For a sole proprietorship:	*The proprietor.*

Authorized application signatories are as follows:	
For a municipal, state, federal or other public facility:	*Either a principal executive officer or ranking elected official.*

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. Additionally, I certify that I have secured and shall maintain permission for Department of Environmental Quality personnel and their invitees to access the permitted facility, including (i) permission to access the land where the facility is located, (ii) permission to collect resource data as defined by Wyoming Statute § 6-3-414, and (iii) permission to enter and cross all properties necessary to access the facility if the facility cannot be directly accessed from a public road. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Michael E. Farnsworth	Vice President and Refinery Manager
Applicant's Printed Name	Applicant's Title
	24 January 2023
Applicant's Signature	Date
307-363-0857	mfarnsworth@parpacific.com
Applicant's Telephone #	Applicant's Email Address

Section 35-11-901 of Wyoming Statutes provides that: *All permit applications must be signed in accordance with 40 CFR Part 122.22, "for", "by", and electronic or digital signatures are not acceptable. Section 35-11-901 of Wyoming Statutes provides that: Any person who knowingly makes any false statement, representation, or certification in any application ... shall upon conviction be fined not more than $10,000 or imprisoned for not more than one year, or both.

Permit Fees

Wyoming Statute 35-11-312 was revised on July 1, 2020 to increase discharge permit fees to $200.00 per year. Permit fees for the entire permit term shall be paid prior to permit issuance, the WYPDES Program does not bill annually. All WYPDES permit applications shall be accompanied by permit fee payment. Any application received without proper fee payment shall be returned to the permittee. Individual WYPDES permits are issued for maximum permit terms of 5 years. Fees are not pro-rated, if a permit is active at any time during a calendar year, the $200.00 fee applies. Fee calculation assistance is available at:

http://deq.wyoming.gov/wqd/discharge-permitting/resources/fee-calculator/.

A check or money order in the amount of $1,000.00 shall be included with all hand-delivered or hard-copy WYPDES applications submitted via regular mail. Beginning July 1, 2020, permittees may pay permit fees electronically using the DEQ's Electronic Fee Payment portal at:

http://deq.wyoming.gov/e-payment/.

The electronic fee payment option is ONLY available for permittees also using the WYPDES Electronic Document (Application) Upload portal at:

https://app.smartsheet.com/b/form/f24845c61f544060978cae5c2bb920ed

Upon electronic permit application submittal, a receipt number is generated and emailed to the permittee; electronic fee payment cannot be completed without this receipt number. Additional electronic fee payment and permit application submission instructions are available on the respective websites noted above.

Permit applications submitted without accompanying fee payment shall not be processed until the appropriate fee is received by the WDEQ. Permit modifications are not subject to permitting fees.

Complete at least one of the following:

I have:

a. Submitted electronic fee payment, receipt number_____.

b. Included a check with my permit application, check #_____, in the amount of $1000

from (institution) Hermes Consolidated, LLC dba Wyoming Refining Company

c. Included a money order with my permit application, order #_____, in the amount of_____

from (institution) _____

AGENCY USE ONLY

Date Payment Received_____ **Payment #**_____

Payment Amount_____ **Approval**_____

WyPDES Supplemental Information
Wyoming Refining Company, Newcastle, WY
Permit # WY0001163 Renewal

9. Outfall and monitoring point locations.

Table B: Outfall Locations

Outfall #	Qtr/Qtr	Section	Township	Range	Latitude	Longitude	Immediate Receiving Stream	Mainstem (closest perennial water)	County
001	NW/NW	8	44 North	61 West	43.81266	-104.21778	Windmill Draw*	Beaver Creek	Weston
002	NW/SW	29	45 North	61 West	43.84768	-104.21704	Little Oil Creek	Beaver Creek	Weston
*Windmill Draw is an unnamed tributary of Blacktail Creek as listed in the Wyoming Surface Water Classification List, June 21, 2001.									

10. A. Provide a brief description of the business conducted at this facility, and the principal products or services it provides.

At the refinery, crude oil is converted into a variety of marketable products, including motor gasoline, jet fuel, distillates, fuel oils, sulfur, and ammonium sulfate (fertilizer). Refining operation involves refining process units such as crude distillation, catalytic cracking, reforming, and alkylation; associated processes such as hydrotreating, fuel gas treatment, gasoline benzene reduction, sulfur recovery, and fertilizer production; and ancillary operations, such as storage, boilers, cooling towers, laboratory analyses, maintenance and cleaning operations, groundwater recovery systems and the wastewater treatment plant. The facility includes truck and rail loading and unloading facilities and operations, product pipeline shipping capabilities, and facilities to receive crude oil from pipeline and trucks.

10. B. Does this facility use cooling water? If yes, where does the cooling water come from and how much is used on a typical day?

Yes. The refinery uses cooling water through exchangers; therefore, it is non-contact cooling water. On a typical day, the cooling water is a combination of fresh water and recirculated water with a portion being discharged to the wastewater treatment system. Below is a table of the amount used on a typical day:

Water Source	Gallons per day (based on a typical day)
Fresh Water from City of Newcastle Madison Wells	253,500
Recirculated Water	18,216,000
Discharged to Wastewater Treatment System (Blowdowns)	63,400
Lost to Evaporation at Cooling Tower	190,100

11. Complete Table C for each existing or proposed outfall at this facility.

Table C: Outfall Descriptions

Outfall #	Final Treatment Unit	Wastewater Source #1	Wastewater Source #2	Choose one Description for Each Outfall:	Treatment Used
001	Windmill Draw Impoundment*	Refinery Process Water	Commingled Storm Water from within Process Units	Continuous (except during the winter months when the Outfall freezes over)	1-U, 2-K, 3-B, 4-A
002	Refinery Storm Water Pond	Storm Water	None	Intermittent	4-A

Table C: Outfall Descriptions (continued)

Outfall #	Final Treatment Unit	Wastewater Source #1	Wastewater Source #2	Choose one Description for Each Outfall:	Treatment Used
003	Not in use	None	None	No Discharge	None
004	Not constructed	None	None	Not Constructed	None
*aka Frog Pond					

12. Provide a brief description of this facility's ultimate disposal method for any solid or liquid wastes other than by outfall discharge. Include applicable permit numbers.

All liquid wastes or out of specification products within the refinery are sent back to Wyoming Refining Company's (WRC) Lift Station to be reprocessed at the facility. All liquid waste streams generated by the systems described in item 10 are transferred to the refinery's wastewater system where any oil is separated from the water and transferred to the main crude oil tank for reprocessing.

There are a couple of options for the disposal method of solids. All contaminated soils are handled per WRC's Soils & Spills Management Plan (SSMP). This would include analytical testing prior to sending to an offsite land-farm or disposal facility.

WRC is also classified as a RCRA Large Quantity Generator of hazardous wastes. All hazardous wastes are immediately categorized by EPA's listed or characteristic compositions. All disposal of hazardous waste conforms to regulations described within Title 40 CFR and applicable subparts. WRC operates under EPA ID No. WYD043705102.

17. Complete Table F by listing all water treatment chemicals used at this facility, including, but not limited to: flocculants, anti-scalants, anti-corrosives, pH and/or hardness adjusters, disinfectants, biofouling agents, and/or catalytic agents. Attach copies of MSDS sheets for all water treatment chemicals listed.

Table F: Water Treatment Chemicals			
Chemical Name	**Manufacturer**	**Purpose**	**Average Quantities Used (gallons/day)**
Caustic Soda 50%	Univar Solutions USA, Inc.	Wastewater pH adjustment	27.4
Sulfuric Acid, 70-100%	Chemtrade Logistics, Inc.	Wastewater pH adjustment	3.5
Sulfuric Acid, 70-100%	Chemtrade Logistics, Inc.	Cooling Tower pH adjustment	10.5
Gengard GN7004	Suez WTS USA, Inc.	Cooling Tower Dispersant	8
Gengard GN7210	Suez WTS USA, Inc.	Cooling Tower Corrosion Inhibitor	4
Sodium Hypochlorite	Suez WTS USA, Inc.	Cooling Tower Microbial Control Agent	26
Hypersperse MDC772	Suez WTS USA, Inc.	RO Unit Membrane Deposit Control Agent	1
Spectrus NX1102	Suez WTS USA, Inc.	RO Unit Solvent-based Microbial Control Agent	1
Caustic Potash Liquid 45%	Occidental Chemical Corporation	RO Unit pH adjustment and Alkalinity	27
Solus AP26	Suez WTS USA, Inc.	Internal Boiler Water Treatment	4
Cortrol IS3080	Suez WTS USA, Inc.	Boiler and Waste Heat Dissolved Oxygen Scavenger	6
Steamate NA0520	Suez WTS USA, Inc.	Waste Heat Neutralizing Amine	1
Steamate LSA1793	Suez WTS USA, Inc.	Steam Condensate Corrosion Inhibitor	4

Table F: Water Treatment Chemicals (continued)			
Chemical Name	**Manufacturer**	**Purpose**	**Average Quantities Used (gallons/day)**
Embreak 2162	Suez WTS USA, Inc.	Desalter Wetting Agent	4
Embreak 2W2021	Suez WTS USA, Inc.	Desalter Emulsion Breaker	5
LoSalt 80L	Suez WTS USA, Inc.	COH/POH Neutralizer	4
Philmplus 5K1642	Suez WTS USA, Inc.	COH/POH Corrosion Inhibitor	6
WR Buffer Injection Solution	Brenntag Pacific, Inc.	BenzOUT pH maintenance	1.4
Polyfloc* AS1002	Suez WTS USA, Inc.	Wet Gas Scrubber Flocculant	0.002
Klaraid* CDP1336	Suez WTS USA, Inc.	Wet Gas Scrubber Coagulant	0.001

22. Provide a list of all toxic pollutants currently used at this facility and/or all toxic pollutants currently being manufactured at this facility as final or intermediate products or byproducts.

A search of refinery records and safety data sheets indicates the following list of chemicals from Chapter 1 Wyoming Surface Water Quality Standards Appendix B, as per Kathy Shreve, Permitting Supervisor, WyDEQ, either are or were at this facility or have the potential to be at this facility:

1,1-Dichloroethylene	1,1,1-Trichloroethane	1,1,2,2-Tetrachlorethane	1,1,2-Trichloroethane
1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichloropropene	1,4-Dichlorobenzene
2-Chloronaphthalene	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol
Acenaphthene	Acrolein	Aluminum	Ammonia
Anthracene	Antimony	Arsenic	Asbestos
Barium	Benzene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Beryllium	Bis(2-ethylhexyl) phthalate	Cadmium	Carbon tetrachloride
Chloride	Chlorite	Chlorobenzene	Chloroform
Chrysene	Copper	Cyanide (free)	Di-n-butyl phthalate
Diethyl phthalate	Dioxin	Ethylbenzene	Ethylene dibromide
Fluoranthene	Fluorene	Fluoride	Glyphosate
Haloacetic Acids	Hexachloroethane	Hydrogen Sulfide	Indeno(1,2,3-cd)pyrene
Iron	Lead	Manganese	Methyl bromide
Methylene chloride	Mercury	Nickel	Nitrates
Nitrites	Nonylphenol	Phenol	Pyrene
Polychlorinated biphenyls	Selenium	Silver	Styrene
Tetrachloroethylene	Thallium	Toluene	Total trihalomethanes
Trichloroethylene	Vinyl chloride	Xylenes	Zinc

Benzo(a)anthracene (1,2-Benzanthracene)
Benzo(a)pyrene (3,4-Benzopyrene)
Benzo(b)fluoranthene (3,4-Benzofluoranthene)
Benzo(k)fluoranthene (11,12-Benzofluoranthene)
Dibenzo(a,h)anthracene (1,2,5,6-Dibenzanthracene)
Chromium is present in the metal in welding rods and wire brushes (not used in crude processing or water treatment).

OUTFALL 001

23. Outfall 001 Table I-1: Effluent Water Quality Results

Constituent and Required Reporting Units	Result (Measured Value)	Laboratory Test Method Used	Practical Quantitation Level Achieved by Lab
5-Day Biochemical Oxygen Demand (BOD_5), mg/L	48	SM 5210	N/A
Chemical Oxygen Demand (COD), mg/L	279	SM 5220 D	N/A
Total Organic Carbon (TOC), mg/L	34.8	SM 5310 C	1.00
Total Suspended Solids (TSS), mg/L)	55	SM 2540 D	10.0

23. Outfall 001 Table I-1: Effluent Water Quality Results

Constituent and Required Reporting Units	Result (Measured Value)	Laboratory Test Method Used	Practical Quantitation Level Achieved by Lab
Ammonia (as N), mg/L	23.8	EPA M350.1	1.00
Temperature (°C) (field measurement)	14.2	NA	NA
pH, standard units (field measurement)	7.94	NA	NA
Discharge color (describe)	Light Pink	Visual	NA

23. Outfall 001 Table I-2: TOXIC AND HAZARDOUS SUBSTANCES (Highlight all you believe to be present.) Provide a brief rationale and at least one water quality analysis.

Acetaldehyde	Diethyl amine Napthenic acid	Monomethyl amine
Allyl alcohol	Dinitrobenzene	Naled
Allyl chloride	Diquat	Nitrotoluene
Amyl acetate	Disulfoton	Parathion
Aniline	Diuron	Phenolsulfonate
Asbestos	Epichlorohydrin	Phosgene
Benzonitrile	Ethion	Propargite
Benzyl chloride	Ethylene diamine	Propylene oxide
Butyl acetate	Ethylene dibromide	Pyrethrins
Butylamine	Formaldehyde	Quinoline
Captan	Furfural	Resorcinol
Carbaryl	Guthion	Strontium
Carbofuran	Dimethyl amine	Strychnine
Carbon disulfide	Isoprene	Styrene
Chlorpyrifos	Isopropanolamine	TDE (Tetrachlorodiphenyl ethane)
Coumaphos	Kelthane	Trichlorofon
Cresol	Kepone	2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
Crotonaldehyde	Malathion	2,425-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]
Cyclohexane	Mercaptodimethur	Triethanolamine
Diazinon	Methoxychlor	Triethylamine
Dicamba	Methyl mercaptan	Trimethylamine
Dichlobenil	Methyl methacrylate	Uranium
Dichlone	Methyl parathion	Vanadium
2,4-D (2,4-Dichlorophenoxyacetic acid)	Mevinphos	Vinyl acetate
2,2-Dichloropropionic acid	Mexacarbate	Xylene
Dichlorvos	Monoethyl amine	Xylenol

- **Asbestos** was used at the refinery in the past. Although unlikely, it has the potential to be found in the effluent.
- **Carbon disulfide** and **Vanadium** have been detected at low levels in ground water and has the potential to be found in the effluent.
- **Cresol**, **Cyclohexane**, **Styrene**, and **Xylene** has been detected in the process streams and has the potential to be found in the wastewater from the water draws. Four labs were contacted and none could analyze for cyclohexane.
- **Ethylene dibromide** has the potential to be found at the refinery.
- **Formaldehyde** is found in a few products in use at the refinery. Although unlikely, it has the potential to be found in the effluent.
- **Uranium** has the potential to be found in the effluent as low level of radioactive materials are found in the effluent.

23. Outfall 001 Table I-2: TOXIC AND HAZARDOUS SUBSTANCES Provide at least one water quality analysis.

Constituent	Result (Measured Value)		Constituent	Result (Measured Value)
Asbestos	No Structures Detected		Formaldehyde	<0.07 mg/L
Carbon Disulfide	<50.0 µg/L		Styrene	<5.00 µg/L
Cresol	<2.5 µg/L		Uranium	0.003 mg/L
Cyclohexane	Not able to analyze		Vanadium	0.049 mg/L
Ethylene dibromide	<5.00 µg/L		Xylene	<10.0 µg/L

24.b. Outfall 001 Table J-2: VOLATILE COMPOUNDS FRACTION

Constituent	Required Testing	Believed Absent	Believed Present	Water Sample Result
acrolein			X	<100 µg/L
acrylonitrile			X	<100 µg/L
benzene		X		<2.50 µg/L
bromoform		X		<2.50 µg/L
carbon tetrachloride		X		<2.50 µg/L
chlorobenzene		X		<2.50 µg/L
chlorodibromomethane		X		<2.50 µg/L
chloroethane			X	<20.0 µg/L
2-chloroethylvinyl ether			X	<100 µg/L
chloroform		X		<2.50 µg/L
dichlorobromomethane		X		<2.50 µg/L
1,1-dichloroethane		X		<2.50 µg/L
1,2-dichloroethane		X		<2.50 µg/L
1,1-dichloroethylene		X		<2.50 µg/L
1,2-dichloropropane		X		<2.50 µg/L
1,3-dichloropropylene		X		<2.50 µg/L
ethylbenzene		X		<2.50 µg/L
methyl bromide			X	<50.0 µg/L
methyl chloride		X		<5.00 µg/L
methylene chloride		X		<2.50 µg/L
1,1,2,2-tetrachloroethane		X		<5.00 µg/L
tetrachloroethylene		X		<2.50 µg/L
toluene		X		<2.50 µg/L
1,2-trans-dichloroethylene		X		<2.50 µg/L
1,1,1-trichloroethane		X		<2.50 µg/L
1,1,2-trichloroethane		X		<2.50 µg/L
trichloroethylene		X		<2.50 µg/L
vinyl chloride		X		<2.50 µg/L

24.b. Outfall 001 Table J-6: Metals, Cyanide, Total Phenols, Hardness, and Byproducts

Constituent	Required Testing	Believed Absent	Believed Present	Water Sample Result
Antimony, Total Recoverable		X		<0.005 mg/L
Arsenic, Dissolved			X	0.012 mg/L
Beryllium, Total Recoverable			X	0.167 mg/L
Cadmium, Dissolved		X		<0.001 mg/L
Chromium, Dissolved	Conditional		X	0.004 mg/L
Copper, Dissolved		X		<0.005 mg/L
Cyanide, Dissolved		X		<0.010 mg/L
Hardness (as $CaCO_3$), Total			X	613 mg/L
Lead, Dissolved		X		<0.001 mg/L
Mercury, Dissolved		X		<0.0002 mg/L
Nickel, Dissolved			X	0.011 mg/L
Phenols, Total Recoverable	X		X	<0.100 mg/L
Selenium, Total Recoverable	X		X	0.012 mg/L
Silver, Total Recoverable		X		<0.001 mg/L
Thallium, Total Recoverable		X		<0.001 mg/L
Zinc, Dissolved		X		<0.050 mg/L
Dioxin:				
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin		X		<10.0 pg/L

24.c. Outfall 001 Table J-7: Conventional and Nonconventional Pollutants

Constituent	Believed Absent	Believed Present	Water Sample Result
Bromide		X	1.70 mg/L
Chlorine, Total Residual	X		<0.011 mg/L
E. coli		X	115 MPN/100mL
Fluoride		X	50 mg/L
Nitrate-Nitrite		X	0.149 mg/L
Nitrogen, Total Organic		X	32.6 mg/L
Oil and Grease		X	10.4 mg/L
Phosphorous		X	0.763 mg/L
Radioactivity:			
Alpha, Total		X	13.1 pCi/L
Beta, Total		X	153 pCi/L
Radium, Total Recoverable		X	5.85 pCi/L
Radium 226, Total Recoverable		X	1.54 pCi/L
Sulfate		X	630 mg/L
Sulfide		X	1.82 mg/L
Sulfite	X		<2.00 mg/L
Surfactants		X	1.00 mg/L
Aluminum, Dissolved		X	0.025 mg/L
Barium, Total Recoverable		X	0.167 mg/L
Boron		X	0.370 mg/L
Cobalt		X	0.002 mg/L
Iron, Dissolved		X	0.132 mg/L
Magnesium, Dissolved		X	89 mg/L
Molybdenum		X	0.006 mg/L
Manganese, Dissolved		X	0.644 mg/L
Tin	X		<0.005 mg/L
Titanium		X	0.089 mg/L

OUTFALL 002

23. Outfall 002 Table I-1: Effluent Water Quality Results

Constituent and Required Reporting Units	Result (Measured Value)	Laboratory Test Method Used	Practical Quantitation Level Achieved by Lab
5-Day Biochemical Oxygen Demand (BOD_5), mg/L	<3.0	SM 5210	N/A
Chemical Oxygen Demand (COD), mg/L	35.7	SM 5220 D	N/A
Total Organic Carbon (TOC), mg/L	11.9	SM 5310 C	0.400
Total Suspended Solids (TSS), mg/L)	<10.0	SM 2540 D	10.0
Ammonia (as N), mg/L	0.370	EPA M350.1	0.200
Temperature (°C) (field measurement)	16.9	N/A	N/A
pH, standard units (field measurement)	7.12	N/A	N/A
Discharge color (describe)	Slightly Yellow	Visual	N/A

23. Outfall 002 Table I-2: TOXIC AND HAZARDOUS SUBSTANCES (Highlight all you believe to be present.)

Acetaldehyde	Diethyl amine Napthenic acid	Monomethyl amine
Allyl alcohol	Dinitrobenzene	Naled
Allyl chloride	Diquat	Nitrotoluene
Amyl acetate	Disulfoton	Parathion
Aniline	Diuron	Phenolsulfonate
Asbestos	Epichlorohydrin	Phosgene
Benzonitrile	Ethion	Propargite
Benzyl chloride	Ethylene diamine	Propylene oxide
Butyl acetate	Ethylene dibromide	Pyrethrins
Butylamine	Formaldehyde	Quinoline
Captan	Furfural	Resorcinol
Carbaryl	Guthion	Strontium
Carbofuran	Dimethyl amine	Strychnine
Carbon disulfide	Isoprene	Styrene
Chlorpyrifos	Isopropanolamine	TDE (Tetrachlorodiphenyl ethane)
Coumaphos	Kelthane	Trichlorofon
Cresol	Kepone	2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
Crotonaldehyde	Malathion	2,425-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]
Cyclohexane	Mercaptodimethur	Triethanolamine
Diazinon	Methoxychlor	Triethylamine
Dicamba	Methyl mercaptan	Trimethylamine
Dichlobenil	Methyl methacrylate	Uranium
Dichlone	Methyl parathion	Vanadium
2,4-D (2,4-Dichlorophenoxyacetic acid)	Mevinphos	Vinyl acetate
2,2-Dichloropropionic acid	Mexacarbate	Xylene
Dichlorvos	Monoethyl amine	Xylenol
Benzyl chloride	Ethylene diamine	Propylene oxide

24.b. Outfall 002 Table J-2: VOLATILE COMPOUNDS FRACTION

Constituent	Required Testing	Believed Absent	Believed Present	Water Sample Result
acrolein		X		<20 µg/L
acrylonitrile		X		<20 µg/L
benzene		X		<0.500 µg/L
bromoform		X		<0.500 µg/L
carbon tetrachloride		X		<0.500 µg/L
chlorobenzene		X		<0.500 µg/L
chlorodibromomethane		X		<0.500 µg/L
chloroethane		X		<4.00 µg/L
2-chloroethylvinyl ether		X		<20 µg/L
chloroform		X		<0.500 µg/L
dichlorobromomethane		X		<0.500 µg/L
1,1-dichloroethane		X		<0.500 µg/L
1,2-dichloroethane		X		<0.500 µg/L
1,1-dichloroethylene		X		<0.500 µg/L
1,2-dichloropropane		X		<0.500 µg/L
1,3-dichloropropylene		X		<0.500 µg/L
ethylbenzene		X		<0.500 µg/L
methyl bromide		X		<10 µg/L
methyl chloride		X		<1.00 µg/L
methylene chloride		X		<0.500 µg/L
1,1,2,2-tetrachloroethane		X		<1.00 µg/L
tetrachloroethylene		X		<0.500 µg/L
toluene		X		<0.500 µg/L
1,2-trans-dichloroethylene		X		<0.500 µg/L
1,1,1-trichloroethane		X		<0.500 µg/L
1,1,2-trichloroethane		X		<0.500 µg/L
trichloroethylene		X		<0.500 µg/L
vinyl chloride		X		<0.500 µg/L

24.b. Outfall 002 Table J-6: Metals, Cyanide, Total Phenols, Hardness, and Byproducts

Constituent	Required Testing	Believed Absent	Believed Present	Water Sample Result
Antimony, Total Recoverable		X		<0.005 mg/L
Arsenic, Dissolved		X		<0.005 mg/L
Beryllium, Total Recoverable		X		<0.001 mg/L
Cadmium, Dissolved		X		<0.001 mg/L
Chromium, Dissolved		X		<0.001 mg/L
Copper, Dissolved			X	0.007 mg/L
Cyanide, Dissolved		X		<0.010 mg/L
Hardness (as $CaCO_3$), Total			X	846 mg/L
Lead, Dissolved		X		<0.001 mg/L
Mercury, Dissolved		X		<0.0002 mg/L
Nickel, Dissolved			X	0.024 mg/L
Phenols, Total Recoverable		X		<0.010 mg/L
Selenium, Total Recoverable	X		X	<0.005 mg/L
Silver, Total Recoverable		X		<0.001 mg/L
Thallium, Total Recoverable		X		<0.001 mg/L
Zinc, Dissolved		X		<0.050 mg/L
Dioxin:				
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin		X		<10 pg/L

24.c. Outfall 002 Table J-7: Conventional and Nonconventional Pollutants

Constituent	Believed Absent	Believed Present	Water Sample Result
Bromide	X		<0.100 mg/L
Chlorine, Total Residual	X		<0.050 mg/L
E. coli		X	19.5 MPN/100 mL
Fluoride		X	3.0 mg/L
Nitrate-Nitrite		X	6.55 mg/L
Nitrogen, Total Organic		X	8.13 mg/L
Oil and Grease		X*	<2.00 mg/L
Phosphorous		X	0.047 mg/L
Radioactivity:			
Alpha, Total		X	4.67 pCi/L
Beta, Total		X	5.67 pCi/L
Radium, Total Recoverable		X	1.27 pCi/L
Radium 226, Total Recoverable		X	0.554 pCi/L
Sulfate		X	1160 mg/L
Sulfide	X		<0.050 mg/L
Sulfite	X		<2.00 mg/L
Surfactants	X		<0.030 mg/L
Aluminum, Dissolved		X	0.026 mg/L
Barium, Total Recoverable		X	0.045 mg/L
Boron		X	0.410 mg/L
Cobalt		X	0.002 mg/L
Iron, Dissolved	X		<0.050 mg/L
Magnesium, Dissolved		X	63.8 mg/L
Molybdenum		X	0.015 mg/L
Manganese, Dissolved		X	0.067 mg/L
Tin	X		<0.005 mg/L
Titanium		X	0.491 mg/L

* Oil and Grease will only be present at Outfall 002 in the event of a spill which affects the storm water pond.

30. For WYPDES permit renewals or modifications, has this facility ever exceeded permit limitations or water quality standards? Yes

Which Constituents?

Since August 1, 2018 (date of last permit renewal) the following constituents exceeded the permit limits:

Location	Constituent	Actual Value	Daily Max Limit	Monthly Avg Limit	Date
Outfall 001	Sulfide	4.35 lb/day	1.81 lb/day	0.81 lb/day	9-1-2021
Outfall 001	Sulfide	2.3 lb/day	1.81 lb/day	0.81 lb/day	9-22-2021
Outfall 001	Total Recoverable Se	6 µg/L	5 µg/L	N/A	3-24-2022
Outfall 001	BOD5	299 lb/day	276 lb/day	153 lb/day	5-24-2022
Outfall 001	BOD5	218 lb/day (avg)	276 lb/day	153 lb/day	5-31-2022
Outfall 001	Sulfide	34.13 lb/day	1.81 lb/day	0.81 lb/day	5-24-2022
Outfall 001	Total Recoverable Se	8 µg/L	5 µg/L	N/A	5-24-2022
Outfall 001	BOD5	254 lb/day	276 lb/day	153 lb/day	6-9-2022
Outfall 001	Sulfide	85.6 lb/day	1.81 lb/day	0.81 lb/day	6-9-2022
Outfall 001	Total Recoverable Se	9 µg/L	5 µg/L	N/A	6-9-2022
Outfall 001	Oil & Grease	16.5 mg/L	10 mg/L	N/A	7-27-2022
Outfall 001	Sulfide	1.19 lb/day	1.81 lb/day	0.81 lb/day	7-27-2022
Outfall 001	Total Recoverable Se	9 µg/L	5 µg/L	N/A	7-27-2022

Location	Constituent	Actual Value	Daily Max Limit	Monthly Avg Limit	Date
Outfall 001	Total Recoverable Se	12 µg/L	5 µg/L	N/A	8-30-2022
Outfall 001	Total Recoverable Se	12 µg/L	5 µg/L	N/A	9-20-2022
Outfall 001	Oil & Grease	10.4 mg/L	10 mg/L	N/A	9-20-2022
Outfall 001	Sulfide	1.31 lb/day	1.81 lb/day	0.81 lb/day	9-20-2022
Outfall 001	Total Recoverable Se	13 µg/L	5 µg/L	N/A	10-25-2022
Outfall 001	Total Recoverable Se	17 µg/L	5 µg/L	N/A	11-8-2022
Outfall 002	Total Organic Carbon	250 mg/L	110 mg/L	N/A	3-4-2022
Outfall 002	Oil & Grease	19.6 mg/L	10 mg/L	N/A	3-4-2022

Has the exceedance been addressed?

All the exceedances listed in the above table have been addressed and are back in compliance with the exception of selenium. The suspected cause of the recent exceedances in selenium (and other parameters) at the Outfall 001 discharge point was the result of a temporary spike in the amount of ethanol present in the wastewater system from the cleaning of the refinery's ethanol storage tank, Tank 140, in May 2022. To prevent a reoccurrence of this event, WRC has included a review of this incident in its annual environmental training given to all employees, WRC now requires a Management of Change (MOC) review for changes in the type or amounts of materials routinely sent to the wastewater system, and WRC has made improvements in the monitoring of system parameters at the direction of their wastewater consultants. Additional steps to address the selenium exceedances are described below.

The last compliance sample was collected on 11/8/2022 as the compliance sample point has since frozen. The selenium concentration for the 11/8/2022 sample was elevated at 17 µg/L. WRC continues to collect monthly samples throughout the wastewater system and, in general, selenium levels within the system been decreasing since the November 2022 sampling event. WRC continues to share wastewater data with their wastewater consultants who also agree that the data indicates that WRC's wastewater system is recovering from the May 2022 upset. WRC is also conducting additional selenium speciation testing at the direction of their consultant. This study is necessary to evaluate potential treatment systems to reduce the selenium concentrations within the wastewater system. WRC will continue to evaluate selenium speciation and system performance data and take additional steps as needed to meet water quality discharge limits.

Describe how the exceedances were addressed.

Outfall 001 Sulfide Exceedance – September 2021 and September 2022

During the sampling periods in September 2021 and September 2022, when sulfide effluent limits were exceeded at Outfall 001, it was noted that the water at Outfall 001 was murky and livestock activity was noted in the wetlands upstream of Outfall 001. No upsets were noted in the operation of either the refinery or the wastewater treatment plant in September 2021 and sulfides appear to have recovered from the May 2022 ethanol upset by August 2022 as indicated by upstream results.

WRC contacted a wastewater consultant to help identify the source of the increased sulfide levels. The consultants concluded that the source of the elevated sulfides was likely coming from cow manure, which is known to contain nitrogen, phosphorous, sulfur, and other chemicals. This appears to be correct as in October of both years, the livestock were removed, the water cleared up, and the sulfide limits were met. As the location of Outfall 001 is in a pasture owned by Mr. Thomas Wright, Wyoming Refining Company is limited in their ability to exclude cattle from this area.

Outfall 001 Total Recoverable Selenium Exceedance – March 2022

No upsets were noted in the operation of either the refinery or the wastewater treatment plant when sampling occurred. It is suspected that the Windmill Draw Impoundment (~31-acre pond located approximately 3100 feet upstream of Outfall 001) experienced turnover due to the ice melting and the unusually warm weather Newcastle was having at the time, resulting in slightly higher-than-normal selenium levels at Outfall 001. By April, the selenium levels were in compliance.

Outfall 001 BOD5 Exceedance – May through June 2022

In May, WRC exceeded the effluent limits for BOD due to a temporary spike of ethanol present in the wastewater system from cleaning of the refinery's ethanol storage tank, Tank 140. Data indicated that the ethanol spike was flushing through the wastewater system as results from a second BOD compliance sample taken on May 31st showed the BOD level was significantly lower compared to the May 24th sample and was below both the daily maximum and monthly average limits.

In June, the results for BOD effluent sampling again exceeded its monthly average permit limit, but was in compliance with the daily maximum limit. As part of WRC's investigation into this event, WRC analyzed upstream wastewater operational and chemical parameters and confirmed that BOD has returned to historical levels. Investigation into this incident also identified the growth of algal mats in the Windmill Draw Impoundment forming in June. According to literature, algal mats deplete the oxygen in the impoundment and likely contributed to the elevated BOD results. The results from the additional sampling events and visual observations of the impoundment have also been discussed with wastewater consultants. The consensus from these discussions indicate that the temporary ethanol spike likely resulted in a significant increase in biological growth within the system which resulted in decreased dissolved oxygen levels and elevated BOD levels. A review of the sample results and visual observations suggest that the water quality in the impoundment quickly recovered from this event as by July BOD had come back into compliance.

WRC has revised its annual wastewater training program to include a review of this event to maintain awareness for all employees, require the use of the refinery's Management of Change (MOC) Program to monitor the introduction of ethanol into the wastewater system and evaluation of wastewater system parameters to minimize any impacts to the performance of the system. WRC also worked with their wastewater consultant to implement an improved evaluation and monitoring program to improve our response time for detecting potential upsets and making the necessary changes to prevent exceedances of our permit limits. These changes included improvements in dissolved oxygen monitoring across the system to assess the health of the aeration systems.

Outfall 001 Sulfide Exceedance – May through July 2022

In May, WRC exceeded the effluent limits for sulfide due to a temporary spike of ethanol present in the wastewater system from cleaning of the refinery's ethanol storage tank, Tank 140.

In June, the results for sulfide again exceeded effluent limits. As part of WRC's investigation into this event, WRC have analyzed upstream wastewater operational and chemical parameters and has confirmed that these parameters have returned to historical levels. WRC also collected additional samples from its wastewater system. Data from these samples indicate a significant decrease in sulfide levels. Investigation into this incident also identified the growth of algal mats in the Windmill Draw Impoundment forming in June. According to literature, algal mats deplete oxygen in the impoundment and likely contributed to the elevated sulfide levels (reduction of sulfates to sulfides). The results from the additional sampling events and visual observations of the impoundment have also been discussed with wastewater consultants. The consensus from these discussions indicate that the temporary ethanol spike likely resulted in a significant increase in biological growth within the system which resulted in decreased dissolved oxygen levels and elevated sulfide levels. A review of the sample results and visual observations suggest that the water quality in the impoundment quickly recovered as by August sulfides had come back into compliance.

WRC has revised its annual wastewater training program to include a review of this event to maintain awareness for all employees, require the use of the refinery's Management of Change (MOC) Program to monitor the introduction of ethanol into the wastewater system and evaluation of wastewater system parameters to minimize any impacts to the performance of the system. WRC also worked with their wastewater consultant to implement an improved evaluation and monitoring program to improve our response time for detecting potential upsets and making the necessary changes to prevent exceedances of our permit limits. These changes included improvements in dissolved oxygen monitoring across the system to assess the health of the aeration systems.

Outfall 001 Total Recoverable Selenium Exceedance – May through November 2022

In May through November 2022, WRC exceeded the effluent limits for selenium due to a temporary spike of ethanol present in the wastewater system from cleaning of the refinery's ethanol storage tank, Tank 140.

Although the other chemicals affected by the ethanol in the wastewater system came back into compliance, WRC's wastewater consultants believe the ethanol release increased the oxygen demand, depleted the available dissolved oxygen (DO), and caused "reducing conditions" (negative oxidation-reduction potential [ORP]) throughout the wastewater system and it will take longer for the selenium levels to come back into compliance. WRC worked with their consultants to develop a selenium sampling study and has identified a laboratory capable of performing the required tests. Three rounds of selenium speciation sampling and testing occurred in December 2022 through January 2023 and the results are being analyzed. This sampling program will evaluate selenium levels and speciation throughout the wastewater system and the results will be used to evaluate corrective actions that can be implemented to address the elevated levels. WRC also expects that the improvements noted above will also have a positive impact on returning the selenium levels back to compliance.

Outfall 001 Oil and Grease Exceedance – July and September 2022

In July and September, the oil and grease effluent limits were exceeded. WRC conducted a review of historical oil & grease data which did not indicate a shift in oil & grease throughout the system with the exception of the elevated levels at S-1 for these two months. WRC revised their evaluation and monitoring program to improve our response time for detecting potential upsets and making the necessary changes to prevent exceedances of our permit limits. These improvements included the purchase of additional testing equipment to increase the frequency of oil & grease monitoring across the wastewater system. WRC continues to monitor the dissolved oxygen throughout the system and take action to address any low reading that indicate performance issues with its aeration systems.

During the month of September, livestock were noted foraging in the wetland area immediately above the sample collection point which may have contributed to these elevated results in September by stirring up sediments and depositing fecal matter in the channel. It is believed that residual Oil and Grease that was tied up in the wetlands was disturbed and released to continue flowing downstream. By October 2022, the livestock were removed and the Oil and Grease limits were met. As the location of Outfall 001 is in a pasture owned by Mr. Thomas Wright, Wyoming Refining Company is limited in ability to exclude cattle from this area.

Outfall 002 Total Organic Carbon & Oil and Grease Exceedance – March 2022

It is unclear where the TOC or Oil & Grease could have come from as the pond held storm water that had not been in contact with refinery equipment. Nor was there a spill that could have entered the pond. A visual observation of the storm water was conducted prior to releasing the water and no presence of a sheen on the water was detected. As the water was released within 4 hours, additional samples could not be obtained. WRC communicated with affected employees its policy that unless holding the storm water in this pond creates an emergency situation, employees will sample the pond and wait for results to be received before releasing and sampling the discharging water to ensure a situation such as this does not occur in the future.

SANITAIRE

a xylem brand

Diffused Aeration Equipment

for

Newcastle, WY

ABTU Bio Tank

Sanitaire #

March 30, 2017

Sanitaire Aeration Design Inputs for: Newcastle, WY

Tank Geometry

1 Train Consisting of:

Parameter	Units	Pass 1
Parallel Reactors		1
Pass Process		Aerobic
SWD	ft	21.0
Submergence	ft	20.0
Volume	ft^3	23,816.4
Reactor Geometry:		Circle
Diameter	ft	38.0

Oxygen/Air Distribution

	Zone	1
	Pass	1
Default		100.0%

Oxygenation

Parameter	Units	Air Flow
No. Trains Operating		1
Air Rate	scfm	350.0

Standard Oxygen Correction Factor Parameters

Parameter	Units	Air Flow
Site Elevation	FASL	4330
Ambient Pressure	PSIA	12.63
Water Temperature	°C	***20***

Notes:

Bold, Italicized text indicate assumptions made by Sanitaire

A - Indicates Actual (AOR) Requirement.

S - Indicates Standard Condition (SOR) Oxygen requirement.

If the AOR/SOR parameter is not given, then its value will be evaluated later if suitable alpha, beta, D.O., theta, pressure, and temperature data is supplied.

Round tanks are evaluated as rectangular tanks diameter equal to length and equal surface area.

Annular tanks are evaluated as rectangular tanks of width equal to the annular width and equal surface area.

Sanitaire Project Name: Newcastle, WY
Sanitaire Project #
Design Summary

	Units	Air Flow Default
No. Trains in Operation		1
No. Grids in Operation		1
No. Operating Diffusers		22
SOR	lb/day	1,284
SOTE	%	14.6
Total Air Rate	scfm	350.0
Min.Diffuser Air Rate	scfm/diff.	15.91
Max. Diffuser Air Rate	scfm/diff.	15.91
Static Pressure	psig	8.66
Diffuser DWP @ Min Air	psig	0.1
Diffuser DWP @ Max Air	psig	0.1
Pressure @ Top of Dropleg	psig	8.83
Est. Blower Efficiency		70%
Est. Motor Efficiency		90%
Shaft Power	Bhp	18.82
Est. Motor Electrical Load	kW	15.60
Est. Standard Aeration Efficiency	#SOR/BHP-hr	2.84

Notes:

(1) Design air is the maximum of process air or mixing air

(2) Delivered oxygen based on design air

(3) Brake Horsepower based on adiabatic compression, 70% mechanical efficiency and 0.30 psi lineloss

(4) Performance based on diffuser density (At/Ad), submergence, and diffuser unit air flow.

(5) Diffuser Air Flow based on Active Valve Modulation

(6) Blower Pressure Capability also requires consideration of:

A. The Air Main headloss (piping, fittings, valves, instrumentation, etc.) between the blower and the aeration assembly dropleg connections.

B. Potential for increased headloss resulting from diffuser fouling and/or aging. Please refer to the US EPA Fine Pore Design Manual (EPA/625/1-89/023), WEF Manual of Practice FD-13, and other

technical publications for a detailed discussion on this subject. Note that this headloss consideration relates to all Fine Pore systems regardless of supplier or type of diffuser element.

C. Increased diffuser submergence during Peak Flow conditions.

(7) Air Flow defined at 20°C

scfm/ft²

Sanitaire Project Name: Newcastle, WY
Sanitaire Project #
Consulting Engineer:
Operating Condition: Air Flow
Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	ft	21.00	
Subm	ft	20.00	
Volume	ft³	23,816.4	23,816.4
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		1	1
Dropleg Diameter	inches	4	
Bandwidth	ft	16.8383	
Header Placement		Midwidth	
Diffusers/Grid		22	22

Oxygen Transfer

Diffuser Type		D24-FH	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	lb/day		
SOR	lb/day		
Air Rate (7)	scfm	350.0	350.0

Performance

Mixing Criteria	scfm/ft²		
Safety Factor	%		
Mixing Air (8)	scfm		
Process Air (for SOR)	scfm	350.0	
Design Air (1,7)	scfm	350.0	350.0
Diffuser Air Rate	scfm/Diff.	15.91	15.91
Delivered SOR	lb/day	1,284.5	1,284.5
Delivered SOTE	%	14.6%	14.6%
Pressure @ Top of Dropleg	psig	8.83	8.83
Shaft Power	Bhp	18.8	18.8

Notes:

(1) Design air is the maximum of process air or mixing air

(2) Delivered oxygen based on design air

(3) Brake Horsepower based on adiabatic compression, 70% mechanical efficiency and 0.30 psi lineloss

(4) Performance based on diffuser density (At/Ad), submergence, and diffuser unit air flow.

(5) Diffuser Air Flow based on Active Valve Modulation

(6) Blower Pressure Capability also requires consideration of:

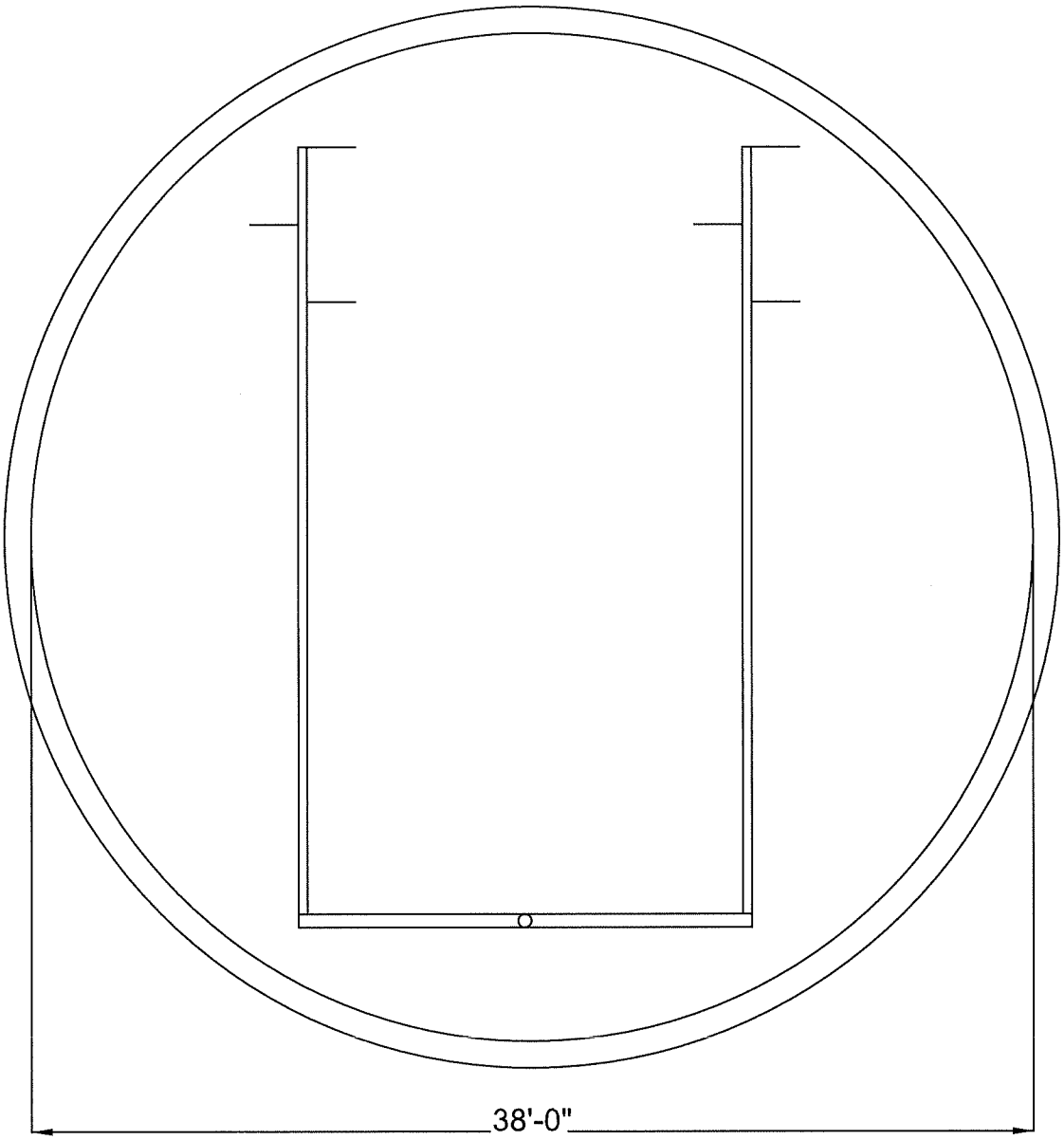
A. The Air Main headloss (piping, fittings, valves, instrumentation, etc.) between the blower and the aeration assembly dropleg connections.

B. Potential for increased headloss resulting from diffuser fouling and/or aging. Please refer to the US EPA Fine Pore Design Manual (EPA/625/1-89/023), WEF Manual of Practice FD-13, and other technical publications for a detailed discussion on this subject. Note that this headloss consideration relates to all Fine Pore systems regardless of supplier or type of diffuser element.

C. Increased diffuser submergence during Peak Flow conditions.

(7) Air Flow defined at 20°C

scfm/ft²



Dropleg	18'–0"@6"Ø	
Manifold	16'–10"@6"Ø	
Header(s) 1,2	29'–2"@4"Ø	11 D–24 Diffusers

PRELIMINARY - THIS DRAWING IS NOT INTENDED FOR CONTRACT DOCUMENTS, SUBMITTALS, OR CONSTRUCTION

Sanitaire
a xylem brand
BROWN DEER, WISCONSIN 53223

CUST NO.

DWG NO.

Newcastle
Stainless Steel Header
Aeration System

DRAWN BY: BB
DATE: 3/29/17
CHKD BY
DATE
APPVD BY
DATE

JOB

SHEET

SANITAIRE
a xylem brand

SITE VISIT CHECKLIST:
STAINLESS STEEL COARSE BUBBLE AERATION EQUIPMENT

Project Information

PO# 705122

Project Number: 18-9404S

Project Name: Wyoming Refining Company

Date of Visit: 5-13-2019

Days of Service: 2

Tank(s) being inspected (i.e. Aeration tank 1): New Bio Tank

Directions to Jobsite (attach map): 22 Stampede St, Newcastle, WY, 82701

Contractor Check

☑ Yes	☐ No	Was the equipment received in good condition?
☐ Yes	☑ No	Did the contractor have difficulty installing equipment?
☐ Yes	☑ No	Will there be back charges?
☐ Yes	☑ No	Were the contractor spare parts received?
☐ Yes	☑ No	If owner spare parts are included, do they have them?

Note: Provide comments (if any) on attached sheet.

Equipment Check

☑ Yes	☐ No	Are supports properly located? (Spacing) and the proper type?
☑ Yes	☐ No	Are struts placed on the proper supports? (If applicable) ☐ N/A
☑ Yes	☐ No	Are plate washers installed correctly on supports?
☐ Yes	☐ No	Are nuts and washers installed top and bottom, on all U-Bolts? ☐ N/A
☑ Yes	☐ No	Are all support nuts installed and tight?
☐ Yes	☐ No	Are double nuts installed and tightened on all expansion joints? ☑ N/A
☑ Yes	☐ No	Are gaskets and/or "O" rings in place and bolts and nuts installed on flanged joints?

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- [x] Yes [ ] No Are all diffusers oriented in proper position ("V" Down) and wrench tight?
- [x] Yes [ ] No Are pipe plugs installed in blank connector locations? (If applicable) N/A
- [x] Yes [ ] No Was "Never Seize" or equal used on diffuser threads?
- [x] Yes [ ] No Are diffusers level within ± 3/8" (10mm)?

  Note: Level refers to diffusers along the length of a header.
- [x] Yes [ ] No Are all diffusers operating in a uniform pattern?
- [x] Yes [ ] No Are removable end caps wrench tight?
- [x] Yes [ ] No Is the system leak free?
- [x] Yes [ ] No Does installation seem to be properly installed?
- [ ] Yes [x] No Observation – Is there anything that should be addressed that may not have been considered in the design? i.e. Influent flow, mixers, gates, and baffle walls directed at piping that may cause damage

General

- [x] Yes [ ] No Is the entire installation in conformance with the Sanitaire drawings marked "Approved for construction"?
- [x] Yes [ ] No Did you perform operator training?
  Note: Operator training should be conducted in conjunction with site inspection visit, and not as a separate trip.
- [ ] Yes [x] No Is a return visit required? If yes, when?_____
  Why?_____
- [x] Yes [ ] No Have all contractual obligations been met?
  Date owner has beneficial use (Date of inspection) May 13, 2019
  Approximate date equipment is placed in operation June 2019

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Corrective Action

☐Yes ☐No Are there any installation items that need to be corrected? Please list.

Entered tank found Both flanges loose, The Band around the Drop leg was also loose. I tightened the bolts and nuts on the flanges and the band. System is ready to be put into Operation.

Comments:

Please provide additional comments. If there were no problems with the installation, please state so.

After hardware was tightened System Ran properly. Ready to go into service.

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Sign Off

Signature (Contractor - Representative) — Date: 5-13-2019

Name (Please Print): Terese Hruska | Firm: WRC | Phone #: 307-746-9870

Signature (Sanitaire Rep. Conducting Service) — Date: 5-13-19

Name (Please Print): Joe W. Hoffstetter Tim Hoffstetter | Firm | Phone #: 704-650-8686

Signature (Plant Operator) — Date

Name (Please Print) | Title | Phone #

SANITAIRE
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SITE VISIT EQUIPMENT CHECKLIST:
FINE BUBBLE AERATION

Fine Bubble Aeration System Staff Training

Project Name: Wyoming Refining Company

Sanitaire Project Number:

Date: 5-13-2015

Instructor: Jon W. Hefner

NAME (pleast print)	POSITION
Terese Hruska	Environmental Engineer