U.S. ENVIRONMENTAL PROTECTION AGENCY

DATA REQUEST FOR THE PETROLEUM REFINING INDUSTRY DETAILED STUDY

July 2017

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) is collecting data about petroleum refineries as part of its effort to review wastewater discharges and the effluent limitations and standards for these operations. Most refineries that process crude oil are currently regulated under the Petroleum Refining Point Source Category (40 CFR 419). This data request solicits information from companies that operate petroleum refineries that were operating during calendar year 2016.

This data request is being conducted under the authority of Section 308 of the Clean Water Act (Federal Water Pollution Control Act, 33 U.S.C. Section 1318). **All companies that receive this data request must respond within 180 days of receipt**. Failure to respond, late filing, or failure to comply with the instructions may result in fines, civil penalties, and other sanctions, as provided by law.

OVERVIEW OF THE DATA REQUEST

The data request is divided into the following parts:

PART A: INTRODUCTION
PART B: UNIT OPERATIONS AND TREATMENT UNITS
PART C: END-OF-PIPE WASTEWATER TREATMENT SYSTEM

Part A collects general refinery information. Part B collects information on specific unit operations and treatment units. Part C collects information on end-of-pipe wastewater treatment systems.

EPA will use the technical data collected in this data request to evaluate water use, wastewater generation, pollution prevention, and wastewater management, treatment, and disposal. For more information on the detailed study of the petroleum refining industry, see https://www.epa.gov/eg/petroleum-refining-effluent-guidelines.

Information collected in Parts A, B, and C is for calendar year 2016, unless otherwise specified. Respondents are not required to collect additional data (e.g., sampling data) for the purposes of responding to this data request.

COMPLETING THE DATA REQUEST

Each part should be completed by the person(s) most knowledgeable about the information requested. All companies must have the corporate official or designee responsible for directing or supervising the response sign the Certification Statement on page v to verify and validate the information provided. Multiple people may complete the data request.

Keep a copy of the completed data request, including attachments. EPA will review the information submitted and may request your cooperation in answering follow-up questions, if necessary, to complete analyses.

Respondents are required to complete and submit either an electronic or hardcopy version of the data request. EPA has distributed hardcopies of the data request to each respondent. Respondents may elect to use this hardcopy to document responses and submit to EPA. As an alternative, EPA has created a fillable Adobe Acrobat Reader® file, which is available at https://www.epa.gov/eg/petroleum-refining-effluent-guidelines. Respondents may choose to download the pdf-file and save the completed data request to CD, DVD, or other removable media device to mail to EPA. Please either save a pdf version of the signed certification statement on page v to the CD/DVD or return a hardcopy of the signed certification statement. The certification statement, data request response, and supporting documents must be mailed to the return address listed on page ii. Do not submit the completed data request and associated documents via email. EPA does not accept confidential information through email.

DATA REQUEST ASSISTANCE

If you have any questions regarding the completion of this data request, you can request assistance using EPA's email and telephone helplines provided below.

EPA Petroleum Refining Data Request Help Lines

Eastern Research Group, Inc. ..... Local: 703-633-1696 or Toll-free: 1-877-353-7560
Internet Electronic Mailing Address (Email)..... petrohelp@erg.com

If questions include any information that is considered confidential business information (CBI), please only request assistance using the telephone helpline. EPA does not accept confidential information through email.

REQUESTING AN EXTENSION

The response to this data request is due **180** days after receipt.

Due to the amount of time allowed to complete the data request, EPA does not anticipate that any extensions will be needed.

RETURNING THE DATA REQUEST

After completing the data request and certifying the information that it contains, mail the completed data request to:

U.S. Environmental Protection Agency
Questionnaire for the Petroleum Refining Detailed Study
c/o Eastern Research Group, Inc.
14555 Avion Parkway, Suite 200
Chantilly, VA 20151-1102

CONFIDENTIAL BUSINESS INFORMATION

If no business confidentiality claim accompanies the information when it is received by EPA, EPA may make the information available to the public without further notice pursuant to 40 CFR 2.203(c).

Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other EPA employees, officers, or authorized representatives of the United States concerned with implementing the Clean Water Act.

It is very important that you limit any confidentiality claims to only that information which is truly CBI. EPA has recent experience receiving requests under the Freedom of Information Act (FOIA) for information related to effluent guidelines rulemakings and industry studies, including information that was claimed as CBI. Information requests made under the FOIA initiate an extensive process that requires the entities that submitted the data to substantiate their claims of CBI by responding to the questions provided below. These substantiation requests may be made several years after the data was submitted to the Agency, by which time the individuals that submitted the data may no longer be working at the company, potentially making it more difficult for your company to locate your copies of the data and recreate your rationale for the confidentiality claim.

Information covered by a claim of confidentiality will be made available to EPA contractors to enable the contractors to perform the work required by their contracts with EPA. All EPA contracts provide that contractor employees use the information only for the purpose of performing the work required by their contracts and will not disclose any CBI to anyone other than EPA without prior written approval from each affected business or from EPA's legal office.

Should you be required to substantiate your confidentiality claim as required by 40 CFR 2.204(e), you will be required to provide responses to the following questions so that EPA can determine whether the information is entitled to confidential treatment:

1. For what period of time do you request that the information be maintained as confidential (e.g., until a certain date, until the occurrence of a specified event, or permanently)? If the occurrence of a specific event will eliminate the need for confidentiality, please specify that event.

2. Information submitted to the EPA becomes stale over time. Why should the information you claim as confidential be protected for the time period specified in your answer to question #1?

3. What measures have you taken to protect the information claimed as confidential? Have you disclosed the information to anyone other than a governmental body or someone who is bound by an agreement not to disclose the information further? If so, why should the information be considered confidential?

4. Is the information contained in any publicly available material such as the Internet, publicly available databases, promotional publications, annual reports, or articles? If so, specify which.

5. Is there any means by which a member of the public could obtain access to the information? Is the information of a kind that you would customarily not release to the public?

6. Has any governmental body made a determination as to the confidentiality of the information? If so, please attach a copy of the determination.

7. For each item or category of information claimed as confidential, explain with specificity why release of the information is likely to cause substantial harm to your competitive position. Explain the specific nature of those harmful effects, why they should be viewed as substantial, and the causal relationship between disclosure and such harmful effects. How could your competitors make use of this information to your detriment?

8. Do you assert that the information is submitted on a voluntary or a mandatory basis? Please explain the reason for your assertion. If you assert that the information is voluntarily submitted information, please explain whether the information is the kind that would customarily not be released to the public.

9. Whether you assert the information as voluntary or involuntary, please address why disclosure of the information would tend to lessen the availability to the EPA of similar information in the future.

10. If you believe any information to be (a) trade secret (s), please so state and explain the reason for your belief. Please attach copies of those pages containing such information with brackets around the text that you claim to be (a) trade secret (s).

11. Explain any other issue you deem relevant (including, if pertinent, reasons why you believe that the information you claim to be CBI is not emission data or effluent data).

While you are not required to substantiate your CBI claims at the time of submission, you may proactively do so. If you choose to substantiate at the time of submission, please be specific by page, paragraph, or data element and substantiate information subject to your claim. Please note that *you bear the burden of substantiating your confidentiality claim(s)*. Generalized or conclusory statements will be given little or no weight in EPA's determination on the confidentiality of the information you claim to be CBI. If you wish to claim your substantiation as CBI, you must mark the substantiation as "Confidential Business Information" or any other similar language identified in 40 CFR 2.203(b).

CERTIFICATION STATEMENT

The individual responsible for directing or supervising the preparation of the data request must read and sign the Certification Statement listed below. The certifying official must be a responsible corporate official or his/her authorized representative.

Certification Statement

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 fine and imprisonment for knowing violations.

Signature of Certifying Official	Date
Printed Name of Certifying Official	( ) Telephone Number of Certifying Official
Title of Certifying Official	
Company Name	

INSTRUCTIONS FOR COMPLETING THE DATA REQUEST

Read all question-specific instructions (throughout the data request) and definitions of key terms in the glossary.

Acronyms and measurement units are defined in the acronyms list at the end of the general instructions.

Enter the Refinery ID on every page of the data request. You will find your Refinery ID in the cover letter you received with your data request.

Not all questions will be applicable to every company or refinery. EPA prepared the data request to be applicable to a variety of refineries; therefore, not all of the questions will apply to every company or refinery. Complete each relevant item in the data request.

Mark responses for each question. Fill in the appropriate response(s) to each question. Answer the questions in sequence unless you are directed to skip.

Best professional judgment. EPA is not requiring your company or refinery to perform non-routine tests or measurements solely for the purpose of responding to this data request. In the event that exact data are not available, provide best estimates. Your company or refinery should use the "Est Value" checkbox provided to indicate the value is an estimate and note the methods that were used to make the estimates in the Comments section located at the end of each part of the data request.

Include any clarifying attachments. If additional pages are required to clarify a response, place the associated question number, as well as your refinery name and ID in the top right corner of each attachment page. The following list contains examples of items that may be included as attachments to a response to this data request:

- Company brochure, pamphlet, and/or general description;
- Process and wastewater treatment flow diagrams; and
- Pollution prevention or best management practices (BMPs) policies or data.

You may need to complete multiple copies of some sections throughout the data request. When completing the data request, specific questions will need to be completed for each type of unit operated at the refinery. EPA has included one copy of these questions in both the hardcopy and fillable pdf. Please include additional copies of the specific questions as necessary for your refinery by photocopying specific pages of the hardcopy data request or inserting pages into the fillable pdf.

Pay close attention to the measurement units requested (e.g., MGD). Measurement units are defined in the acronyms list at the end of these instructions. Report answers in the units that are specified, unless the question requires you to specify the units. Please make every attempt to provide all pollutant concentrations in mg/L, where applicable.

Handle all non-detect values as zero. When calculating average concentration values specified throughout the data request, any non-detect value should be handled as a value of zero. Any deviations from this methodology should be identified in the Comments section.

Indicate information that should be treated as confidential. You may claim as confidential all information included in the response to a question by checking the Confidential Business Information (CBI) box next to the question number. See the CONFIDENTIAL BUSINESS INFORMATION section on page iii for more information about CBI claims.

Questions? If you have questions regarding the completion of this questionnaire, see the DATA REQUEST ASSISTANCE section on page ii.

ACRONYMS

$	Dollar
APC	Air pollution control
API	American Petroleum Institute
BD	Block diagram
BOD	Biochemical oxygen demand
BRU	Benzene removal unit
CBI	Confidential business information
CCU	Catalytic cracking unit
CFR	Code of Federal Regulations
CO	Carbon monoxide
COD	Chemical oxygen demand
CPI	Corrugated plate interceptor
CRU	Catalytic reforming unit
DAF	Dissolved air flotation
DCU	Delayed coking unit
DGF	Dissolved gas flotation
DPY	Days per year
EA	Environmental assessment
EIS	Environmental impact statement
ELG	Effluent limitations guidelines and standards
EPA	U.S. Environmental Protection Agency
ESP	Electrostatic precipitator
EST	Estimated
FRS	Federal Registry Service
GAC	Granular activated carbon unit
GPD	Gallons per day
g/L	Grams per liter
IAF	Induced air flotation
ID	Identification number
IGF	Induced gas flotation
$LoTO_x$™	Linde's Low temperature oxidation for NO_X control system
MBBR	Moving bed bioreactor or moving bed biofilm reactor
MBR	Membrane bioreactor
MGD	Million gallons per day
mg/L	Milligrams per liter
NO_X	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
PM	Particulate matter
POTW	Publicly Owned Treatment Works
SCR	Selective catalytic reduction
SNCR	Selective non-catalytic reduction
SO_2	Sulfur dioxide
SWS	Sour water stripper
TDS	Total dissolved solids
TKN	Total Kjeldahl nitrogen
TOC	Total organic carbon
TSS	Total suspended solids
UIC	Underground injection control
ug/L	Micrograms per liter
WESP	Wet electrostatic precipitator
WWT	Wastewater treatment

GLOSSARY

Word	Definition
Adsorption	Removal of a pollutant from air or water by collecting the pollutant on the surface of a solid material (e.g., method of treating waste in which activated carbon removes pollutants from vented gases or wastewater).
Aerobic	An environment involving free molecular oxygen.
Aerobic impoundment	A wastewater treatment unit in which aerobic biological growth occurs in an impoundment (see definition for impoundment). The biological growth is suspended in wastewater containing colloidal, dissolved organic, and inorganic materials. The microorganisms use the organic material as a carbon source and energy for the microbial growth, and convert the carbon source into cell tissue, water, and oxidized products (mainly carbon dioxide [CO_2]).
Air pollution control	The removal of pollutant(s) from a gas stream.
Anaerobic	An environment lacking free molecular oxygen.
Anaerobic impoundment	A wastewater treatment unit in which anaerobic biological growth occurs in an impoundment (see definition for impoundment). The biological growth is suspended in an anaerobic aqueous environment. Anaerobic microorganisms break down the organics in the wastewater, producing methane (CH_4) and CO_2.
API gravity	American Petroleum Institute (API) measure of specific gravity of crude oil or condensate in degrees. A scale that compares the specific gravity of oil to that of water through a calculation designed to ensure consistence in measurement: API Gravity = ((141.5/specific gravity) – 131.5).
Benzene removal unit	A steam stripping unit, thin-film evaporation unit, or any other standalone wastewater treatment process installed for the purpose of controlling benzene emissions to comply with 40 CFR 61, Subpart FF or other regulatory requirements. This definition does not include units that treat benzene solely from air emission sources (e.g., vents).
Biological treatment system	A treatment system that uses microorganisms to remove pollutants present in the wastewater.
Boiler blowdown	A water discharge from a boiler to control parameters (e.g., suspended solids, inorganic materials, etc.) that contribute to scale and corrosion in a boiler.
CANSOLV®	An air pollution control technology for sulfur dioxide (SO_2) removal which uses an aqueous amine solution to selectively absorb SO_2 from flue gas. Flue gas is the exhaust exiting a process as a result of combustion.
Confidential business information	In accordance with 40 CFR 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words “confidential business information” on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR 2 (Public Information). (See 40 CFR 122.7)
Chemical precipitation	The addition of chemicals to alter the solubility of element(s) or compound(s) in a solution such that it emerges as an insoluble solid.
Chemical trade name	The manufacturer’s specific name for a chemical or combination of chemicals.
Clarifier	A wastewater treatment unit designed and operated to remove solids by gravity settling. It may or may not include internal equipment (e.g., rakes, scrapers, skimmers).
Coke cutting water	High pressure water used to cut the coke built up in coke drums during the coking process.
Continuous Regenerative CRU	A catalytic reforming unit (CRU) with the ability to continuously regenerate catalyst from a series of reactors for regeneration within a separate regenerator.

Conventional pollutants	The Clean Water Act Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand, total suspended solids, fecal coliform, pH, and any additional pollutants EPA defines as conventional. The Agency designated oil and grease as an additional conventional pollutant (44 FR 44501).
Cooling water blowdown	A water discharge from the cooling tower system intended to reduce scale, fouling, and/or corrosion on heat exchanger surfaces.
Corrugated/parallel plate interceptor	A wastewater treatment unit that enables separation of oil from water. The unit consists of a tank with internal corrugated or flat parallel plates. Wastewater flows between the plates, with the lighter oil droplets floating upward towards the plates where they are able to coalesce. Some solids typically settle in the bottom of the unit.
Cyclic Regenerative CRU	A CRU with at least four reactors with the necessary equipment and ability to take one reactor off-line as needed for in-situ catalyst regeneration while the other three reactors continue to operate under normal production mode.
Cyclone	An air pollution control device which uses centrifugal and inertial forces to reduce particulate matter (PM) emissions to the atmosphere. For example, a CCU cyclone is typically downstream of / external to the CCU, may be called a third stage or tertiary cyclone, and its primary function is to remove PM (not return catalyst to the CCU).
Destination	The place to which a wastewater stream is sent.
Discharges	The conveyance of process wastewater to: (1) surface waters; or (2) a publicly owned, privately owned, federally owned, centralized treatment, or other treatment works.
Dissolved gas flotation	Wastewater treatment unit that introduces gas into wastewater under pressure supersaturating the water with dissolved gas (e.g., air, nitrogen, natural gas). When supersaturated water is released into the unit at atmospheric pressure, gas comes out of solution and bubbles rise through the liquid and attach to oil droplets. Once at the surface, oil is skimmed off.
Dry scrubber (type of SO_2 controls)	An air pollution control unit that injects or sprays reagents or slurries into a gas stream. Acid gases are absorbed by the reagent or slurry and are removed as solids.
Effluent guidelines	National standards for industrial wastewater discharges to surface waters and publicly owned treatment works (municipal sewage treatment plants). EPA issues effluent guidelines for categories of existing sources and new sources under Title III of the Clean Water Act. The standards are technology-based (i.e., they are based on the performance of treatment and control technologies); they are not based on risk or impacts upon receiving waters. (See https://www.epa.gov/eg/industrial-effluent-guidelines)
Electrostatic precipitator	A device that removes particles from a gas stream by using electrical energy to charge particles either positively or negatively. The charged particles are then attracted to collector plates carrying the opposite charge. The collected particles may be removed from the collector plates as dry material (dry ESPs), or they may be washed from the plates with water (wet ESPs).
End-of-pipe wastewater treatment system	For regulated discharges, the combination of wastewater treatment units that treat the combined wastewater flow at a refinery (e.g., end-of-pipe wastewater treatment units generally begin with the forebay of the primary oil/water separation unit and end at the point of discharge).
End-of-pipe wastewater treatment system upset	An exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (See 40 CFR 122.41(n))
Equalization unit	Unit used to dampen variations in flow rate and composition.
Feedstock	The crude oil and natural gas liquids fed to the topping units. (See 40 CFR 419.11)
Granular activated carbon	Highly porous carbon material made from organic materials with high carbon contents (such as wood, lignite, and coal) used to remove pollutants from water by adsorption.

Hydrocyclone	A unit that uses centrifugal force to separate solids from wastewater.
Impoundment	A natural topographic depression, man-made excavation, or diked area formed from earthen materials or man-made materials or a combination of them, which is designed to hold an accumulation of liquid process wastes or process wastes containing free liquids, and which is not an injection well. Examples of impoundments include holding, storage, settling, and aeration pits, ponds, and lagoons. It does not include building sumps and outdoor collection/transfer concrete basins.
Indirect discharge	Discharge of pollutants to publicly owned treatment works.
Induced gas flotation	A wastewater treatment unit that introduces gas (e.g., air, nitrogen, natural gas) bubbles into a body of wastewater. Bubbles rise through the liquid and attach to oil droplets. Once at the surface, oil is skimmed off. Gas bubbles (typically nitrogen) can be generated by mechanical methods (i.e., mechanical shear or propellers) or by diffusing gas through a porous media.
Ion exchange	Reversible exchange of ions adsorbed on a mineral or synthetic polymer surface with ions in solution that is in contact with the surface.
LABSORB™ Regenerative SO_2 Scrubbing System	Belco® air pollution control technology which uses sodium phosphate to absorb SO_2. The sodium phosphate solution is regenerated for reuse and a high concentration SO_2 stream is recovered.
Lamella (inclined-plate) clarifier	A system that uses a series of inclined plates to increase the surface area over which particles can settle out of a liquid phase.
LoTOx™ NO_X control	The Linde Group air pollution control technology which uses oxygen to produce ozone via an ozone generator which reacts with Nitrogen Oxides (NO_X) present in gas to form Dinitrogen Pentoxide (N_2O_5). The oxidized nitrogen compounds are highly soluble and can be removed using conventional wet scrubbers.
Low NO_X burner	A burner which minimizes thermal NO_X formation from nitrogen through internal flue gas recirculation and fuel staging.
Media filtration	Filter that uses sand, coal, garnet, and/or other media to remove suspended solids by straining.
Membrane bioreactor	A wastewater treatment unit that combines aerobic suspended growth biological treatment with membranes for liquids-solids separation.
Membrane filtration	A water or wastewater treatment unit using filtration methods that remove suspended or dissolved material using membranes (e.g., microfiltration, ultrafiltration, nanofiltration, reverse osmosis).
Moving bed bioreactor / moving bed biofilm reactor	A wastewater treatment unit that uses microorganisms to remove pollutants present in the wastewater. Media are used to increase the surface area for microorganisms to grow and circulated in aerobic and anaerobic activated sludge environments.
Non-conventional pollutants	Any pollutant not considered a conventional or a toxic pollutant.
Non-process area stormwater	Water flow as a result of precipitation (rain, snowmelt, etc.) over land or impervious surfaces in areas that do not process raw material, intermediate products, finished products, byproducts, or waste products.
Non-process wastewater	Any wastewater that does not come into direct contact with or result from production or use of any raw material, intermediate product, finished product, byproduct, or waste product. An example of non-process wastewater is sanitary wastewater.
Normal operations	Normal operations are all operating periods other than periods of startup, shutdown, equipment malfunction, or upset. For cyclic processes, normal operation includes all periods of the cyclic process. For example, cycling coke drums on a delayed coking unit or catalyst regeneration cycles for catalytic reforming units are considered normal operations. Periods of low processing rates are considered normal operations unless they occur during a period of startup, shutdown, equipment or component malfunction, or upset.

NO_X reducing additives	Chemicals added to reduce emissions of NOx.
National Pollutant Discharge Elimination System	The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of Clean Water Act. (See 40 CFR 122)
Off-site locations	Locations not on contiguous refinery property.
Oil/water separation unit	A wastewater treatment unit that uses differences in specific gravity to separate water, oil and sludge. In an oil/water separation unit free oil rises to the surface and floats on water, the denser of the two liquids. The free oil that floats on the surface is skimmed off, while the sludge that settles to the bottom of the separation unit is removed periodically. An API separator is a specific type of oil/water separation unit that is designed in accordance with API's design guidelines.
Permit	An authorization, license, or equivalent control document issued by EPA or delegated authority to implement the requirements of 40 CFR 122, 123, and 124. (See 40 CFR 122.2)
pH adjustment	Changing the pH, acidity, alkalinity, or molar concentration of the hydrogen ion of a substance by adding alkaline or acidic materials.
Pollutant	Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. (See 40 CFR 122.2) For the purposes of this survey, temperature and heat are not considered pollutants.
Pretreatment permit	Permit for discharge from an industry to a POTW.
Priority pollutants	List of 126 chemical pollutants listed at 40 CFR 423, Appendix A. See https://www.epa.gov/eg/toxic-and-priority-pollutants-under-clean-water-act#priority for more information.
Process area stormwater	Water flow as a result of precipitation (rain, snow melt, etc.) over land or impervious surfaces in areas that process raw materials, intermediate products, finished products, byproducts, or waste products.
Process Control	Adjustment of inputs or conditions of a process to generate a desired outcome.
Process wastewater	Any water at the refinery which, during manufacturing or processing, comes into direct contact with or results from the production or use of raw material, intermediate product, finished product, byproduct, or waste product. Process wastewater may be reused within the process. (See 40 CFR 122.2) Examples of process wastewater for petroleum refineries include, but are not limited to, wastewater from crude processing (e.g., distillation), stripped sour water, equipment cleaning, air pollution control devices, rinse water, process area stormwater, and condenser cooling water (i.e., once through cooling water, cooling tower blowdown).
Publicly owned treatment works (POTW)	A treatment works (as defined by Clean Water Act Section 212) that is owned by a state or municipality (as defined by Clean Water Act Section 502(4)). This definition includes any devices or systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW treatment plant. The term also means the municipality (as defined in Clean Water Act Section 502(4)) that has jurisdiction over the indirect discharges to and the discharges from such a treatment works. (See 40 CFR 403.3(q))
Recycle/reuse	To return a stream or a portion of a stream to another process or system (e.g., fire water system) at the refinery or back to the process where the stream was generated.
Reverse osmosis	A filtration process designed to separate particulate, colloidal, and dissolved matter from a liquid using a semi-permeable membrane, where pressure in excess of the osmotic pressure is applied to the concentrated side of the membrane.
Selective catalytic reduction	An air pollution control device which uses a catalyst with ammonia (NH_3) to reduce nitrogen oxide (NO) and nitrogen dioxide (NO_2) to nitrogen (N_2) and water.

Selective non-catalytic reduction	An air pollution control device which does not require the use of a catalyst to reduce NO and NO_2 in the flue gas to N_2 and water.
Semi-Regenerative CRU	A CRU with at least three reactors that must be shut down for in-situ catalyst regeneration.
Settling	Physical treatment process that aims to separate solid particles from a liquid stream by gravitational force (i.e., sedimentation).
Sludge/Solid	Any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.
SO_2 reducing additives	Chemicals added to adsorb sulfur oxides and release the sulfur as hydrogen sulfide for eventual recovery in the sulfur recovery plant.
Sour water stripper	A refinery process unit which: 1) Is designed and operated to remove sulfur compounds (usually hydrogen sulfide) from sour water streams (it may also be designed and operated to remove ammonia); 2) Has the sour water streams transferred to the stripper through hard piping or other enclosed system; and 3) Is operated in such a manner that the off gases are sent to a sulfur recovery unit, processing unit, incinerator, flare, or other combustion device. (See 40 CFR 61, Subpart FF)
Source water	The incoming non wastewater supply for the refinery.
Tank-based activated sludge	A wastewater treatment unit in which aerobic biological growth occurs within a tank or reaction vessel. Biological growth is suspended in wastewater containing colloidal, dissolved organic, and inorganic materials. The microorganisms use the organic material as a carbon source and energy for the microbial growth, and convert the food into cell tissue, water, and oxidized products (mainly CO_2).
Tank-based anaerobic unit	A wastewater treatment unit in which anaerobic biological growth occurs within a tank or reaction vessel. Biological growth is suspended in an aqueous anaerobic environment. Anaerobic microorganisms break down the organics in the wastewater, producing CH_4 and CO_2.
Toxic pollutants	List of 65 pollutants or groups of pollutants at 40 CFR 401.15. See https://www.epa.gov/eg/toxic-and-priority-pollutants-under-clean-water-act#priority for more information.
Treat	Processing of wastewater by physical, chemical, biological, or other means to remove specific constituents of the liquid stream or to alter the physical or chemical state of specific constituents of the liquid stream.
Wastewater treatment	The processing of wastewater by physical, chemical, biological, or other means to remove specific pollutants from the wastewater stream or to alter the physical or chemical state of specific pollutants in the wastewater stream. Treatment is performed to allow for discharge of wastewater or recycle/reuse of wastewater.
Wastewater treatment system	A combination of one or more wastewater treatment units designed to achieve wastewater treatment.
Wastewater treatment unit	A unit operation used to remove pollutants from process wastewater. Wastewater treatment units include, but are not limited to: ponds/impoundments, chemical precipitation, pH adjustment, clarification, biological reactor, thickeners, filters, and constructed wetlands.
Wet scrubber	Air pollution control device that remove pollutants from a gas stream by absorption with a liquid stream.

UNIT OPERATIONS AND TREATMENT CODES

API	American Petroleum Institute
BRU	Benzene removal unit
BTS	Biological treatment system
CCU	Catalytic cracking unit
CPI	Corrugated plate interceptor
CRU	Catalytic reforming unit
DAF	Dissolved air flotation
DCU	Delayed coking unit
DGF	Dissolved gas flotation
ESP	Electrostatic precipitator
EQ	Equalization unit
GAC	Granular activated carbon unit
IAF	Induced air flotation
IGF	Induced gas flotation
MBBR	Moving bed bioreactor or moving bed biofilm reactor
MBR	Membrane bioreactor
SCR	Selective catalytic reduction
SNCR	Selective non-catalytic reduction
SWS	Sour water stripper
WESP	Wet electrostatic precipitator
WWT	Wastewater treatment

Refinery Name:_____

Refinery ID:_____

PART A: INTRODUCTION

INSTRUCTIONS: Complete Part A of the questionnaire for your refinery.

The U.S. Environmental Protection Agency (EPA) is interested in collecting information on specific unit operations and wastewater treatment (WWT) units operated at petroleum refineries. The questions in this section focus on general information about the refinery and its ownership, as well as information on other general topics (e.g., crude characteristics, production, and source water).

All responses should reflect the 2016 operating year. Refineries are not required to collect any additional data (e.g., sampling data) for the purpose of responding to this data request. Where exact data are not available, use available data to estimate the response based on best judgement. Throughout the data request, identify estimated values using the "Est Value" checkboxes provided. Please include a comment in the Comments section at the end of Part A if you check the "Est Value" box to describe the methodology or calculation used to generate each estimate. If 2016 is not indicative of a normal operating year, respondents may provide data for additional year(s); however, you must still provide data for 2016. Data for years other than 2016 will be considered by EPA in addition to the data requested for 2016. This additional data should be included in the Comments section.

Provide flow rate and concentration data in the units specified. If units are not specified, please use the most appropriate units from the acronym list.

Use the Comments section at the end of Part A to provide additional information as applicable to specific questions within Part A.

You may claim data elements as confidential business information (CBI) if they meet the requirements for CBI claims in 40 CFR 2, Subpart B. See the CBI section of the general data request instructions for details.

Refinery Name:_____

Refinery ID:_____

Section 1: General Refinery Information

A.1 CBI? ☐ Yes

Provide the physical refinery address in the spaces provided below.

_____
Refinery Name

_____
Address

_____
City

_____ _____
State Zip Code

A.2 CBI? ☐ Yes

Provide the information requested below for at least one contact for technical information supplied in this questionnaire.

_____
Primary Technical Contact Name

_____
Primary Technical Contact Title

_____
Email

_____
Street Address

_____ _____ _____
City State Zip Code

Refinery Name:_____

Refinery ID:_____

_____
Secondary Technical Contact Name

_____
Secondary Technical Contact Title

_____
Email

_____
Street Address

_____ _____ _____
City State Zip Code

A.3 CBI? ☐ Yes

Provide the EPA Facility Registry Service (FRS) IDs for the refinery wastewater permits.

_____
EPA FRS Identification Codes

A.4 CBI? ☐ Yes

Indicate under which subparts of the current effluent limitations guidelines (ELGs) (40 CFR 419) this refinery is subcategorized. [Select all that apply]

☐ Part 419.10, Subpart A (Topping)

☐ Part 419.20, Subpart B (Cracking)

☐ Part 419.30, Subpart C (Petrochemical)

☐ Part 419.40, Subpart D (Lube)

☐ Part 419.50, Subpart E (Integrated)

Refinery Name:________________________________

Refinery ID:___________________________________

A.5 CBI? ☐ Yes

In the table below provide a list of the refinery's most recently approved permit(s) related to water discharges. If the refinery has more than one identification number (ID) for a permit type, list all IDs in the space provided.

Note: Do NOT include the following types of permits: construction permits, erosion and sediment control permits associated with construction activities, temporary or general permits for stormwater or hydrostatic testing water, water obstruction and encroachment permits, underground injection control (UIC) permits, and/or water allocation permits.

Permit Type	**Permit ID(s)**	**Effective Date** (month/year)	**Type of Wastewater Included in Permit**
National Pollutant Discharge Elimination System (NPDES)	_________________	_________________	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: ____________________
National Pollutant Discharge Elimination System (NPDES)	_________________	_________________	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: ____________________
National Pollutant Discharge Elimination System (NPDES)	_________________	_________________	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: ____________________

Refinery Name:______________________________

Refinery ID:______________________________

Permit Type	Permit ID(s)	Effective Date (month/year)	Type of Wastewater Included in Permit
Pretreatment Permit	_______________ Control Authority:	_______________	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: _______________
Pretreatment Permit	_______________ Control Authority:	_______________	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: _______________
Pretreatment Permit	_______________ Control Authority:	_______________	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: _______________
Other, specify:	_______________	_______________	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: _______________

Refinery Name:_____

Refinery ID:_____

Permit Type	**Permit ID(s)**	**Effective Date** (month/year)	**Type of Wastewater Included in Permit**
Other, specify:	_____	_____	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: _____
Other, specify:	_____	_____	☐ Process wastewater (treated or untreated) ☐ Non-process wastewater (treated or untreated) ☐ Process area stormwater ☐ Non-process area stormwater ☐ Cooling water blowdown ☐ Boiler blowdown ☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

A.6 CBI? ☐ Yes

Have any studies assessing the condition of the surface water(s) related to discharges from the refinery, including information regarding water quality, vegetation, aquatic life (e.g., fish and shellfish), and aquatic-dependent wildlife (e.g., fish-eating terrestrial wildlife) been conducted by the refinery pursuant to an NPDES permit requirement?

☐ Yes

☐ No

If yes, please provide a copy of the results from the study or studies.

☐ I have included the results from the study or studies

☐ I did not include the results from the study or studies. Explain why:

A.7 CBI? ☐ Yes

What is the ultimate destination of process wastewater generated by the refinery? [Select all that apply]

☐ Completely recycled back to refinery (i.e., no discharge)

☐ Partially recycled back to the refinery

☐ Discharged to surface water with no treatment

☐ Discharged to surface water after treatment

☐ Transferred to publicly owned treatment works (POTW) or third party (other nearby facility or other treatment facility).

Name of POTW or third party: _____

☐ Wastewater management or treatment resulting in no discharge (e.g., evaporation), explain:

☐ Other, explain:

Refinery Name:_____

Refinery ID:_____

A.8 CBI? ☐ Yes

What is the ultimate destination of non-process wastewater generated by the refinery? [Select all that apply]

☐ Completely recycled back to refinery (i.e., no discharge)

☐ Partially recycled back to the refinery

☐ Discharged to surface water with no treatment

☐ Discharged to surface water after treatment

☐ Transferred to POTW or third party (other nearby facility or other treatment facility).

Name of POTW or third party:_____

☐ Wastewater management or treatment resulting in no discharge (e.g., evaporation), explain:

☐ Other, explain:

A.9 CBI? ☐ Yes

What is the ultimate destination of process area stormwater collected by the refinery? [Select all that apply]

☐ Completely recycled back to refinery (i.e., no discharge)

☐ Partially recycled back to the refinery

☐ Discharged to surface water with no treatment

☐ Discharged to surface water after treatment

☐ Transferred to POTW or third party (other nearby facility or other treatment facility).

Name of POTW or third party: _____

☐ Wastewater management or treatment resulting in no discharge (e.g., evaporation), explain:

☐ Other, explain:

Refinery Name:_____

Refinery ID:_____

A.10 CBI? ☐ Yes

What is the ultimate destination of non-process area stormwater collected by the refinery? [Select all that apply]

☐ Completely recycled back to refinery (i.e., no discharge)

☐ Partially recycled back to the refinery

☐ Discharged to surface water with no treatment

☐ Discharged to surface water after treatment

☐ Transferred to POTW or third party (other nearby facility or other treatment facility).

Name of POTW or third party receiving wastewater:_____

☐ Wastewater management or treatment resulting in no discharge (e.g., evaporation), explain:

☐ Other, explain:

Section 2: Crude Information

A.11 CBI? ☐ Yes

Provide the weighted average American Petroleum Institute (API) gravity and sulfur content by volume for 2016 for the input to the crude oil atmospheric distillation units.

API gravity (weighted average by volume for 2016): _____ ☐ Est Value

Sulfur content (weighted average by volume for 2016): _____ ☐ Est Value

Section 3: Refinery Production

A.12 CBI? ☐ Yes

Provide the total input to the crude oil atmospheric distillation units for 2016.

_____ barrels of feedstock ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 4: Refinery Source Water Information

A.13 CBI? ☐ Yes

In the table below provide information on the source water used by the refinery. Please list the total intake from each source used in 2016 in million gallons per day (MGD) and identify source water pretreatment (excluding once-through cooling water). List all water sources used by the refinery.

Source	**Source Type** [Select one]	**Name of Source** (Water body, wastewater stream, municipality, etc.)	**Average Annual Intake for 2016** (MGD)	**Type of Source Water Pretreatment at Refinery** [Select all that apply]
Source 1	☐ Surface water ☐ Process wastewater ☐ Non-process wastewater ☐ Groundwater ☐ Purchased water ☐ Purchased steam ☐ Other	_____	_____ MGD ☐ Est Value	☐ No pretreatment ☐ Clarification ☐ Ion Exchange ☐ Reverse Osmosis ☐ Other, specify: _____
Source 2	☐ Surface water ☐ Process wastewater ☐ Non-process wastewater ☐ Groundwater ☐ Purchased water ☐ Purchased steam ☐ Other	_____	_____ MGD ☐ Est Value	☐ No pretreatment ☐ Clarification ☐ Ion Exchange ☐ Reverse Osmosis ☐ Other, specify: _____
Source 3	☐ Surface water ☐ Process wastewater ☐ Non-process wastewater ☐ Groundwater ☐ Purchased water ☐ Purchased steam ☐ Other	_____	_____ MGD ☐ Est Value	☐ No pretreatment ☐ Clarification ☐ Ion Exchange ☐ Reverse Osmosis ☐ Other, specify: _____
Source 4	☐ Surface water ☐ Process wastewater ☐ Non-process wastewater ☐ Groundwater ☐ Purchased water ☐ Purchased steam ☐ Other	_____	_____ MGD ☐ Est Value	☐ No pretreatment ☐ Clarification ☐ Ion Exchange ☐ Reverse Osmosis ☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

Source	**Source Type** [Select one]	**Name of Source** (Water body, wastewater stream, municipality, etc.)	**Average Annual Intake for 2016** (MGD)	**Type of Source Water Pretreatment at Refinery** [Select all that apply]
Source 5	☐ Surface water ☐ Process wastewater ☐ Non-process wastewater ☐ Groundwater ☐ Purchased water ☐ Purchased steam ☐ Other	_____	_____ MGD ☐ Est Value	☐ No pretreatment ☐ Clarification ☐ Ion Exchange ☐ Reverse Osmosis ☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

Comments from Part A

Cross reference your comments by question number and indicate the confidential status of your comment by checking (✓) the box in the column titled "CBI" (Confidential Business Information).

Question Number	CBI?	Comment
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	

Refinery Name:_____

Refinery ID:_____

PART B: UNIT OPERATIONS AND TREATMENT UNITS

INSTRUCTIONS: Complete Part B of the data request for your refinery.

The U.S. Environmental Protection Agency (EPA) is interested in characterizing process wastewater generated from specific unit operations at petroleum refineries and units used to treat process wastewater before transfer to an end-of-pipe wastewater treatment (WWT) system (see Part C) or other destination.

Section 1 identifies the unit operations and treatment units of interest at the refinery; each of these units should be included on the block diagram requested in Question B.2. Section 1 includes an example block diagram showing the level of detail required. Not all refineries will be required to complete all sections of Part B. Please follow the instructions and skip patterns to complete specific sections of Part B for your refinery's configuration.

All responses should reflect the 2016 operating year. Refineries are not required to collect any additional data (e.g., sampling data) for the purpose of responding to this data request. Where exact data are not available, use available data to estimate the response based on best judgement. Throughout the data request, identify estimated values using the "Est Value" checkboxes provided. Please include a comment in the Comments section at the end of Part B if you check any "Est Value" box to describe the methodology or calculation used to generate each estimate. If 2016 is not indicative of a normal operating year, respondents may provide data for additional year(s); however, you must still provide data for 2016. Data for years other than 2016 will be considered by EPA in addition to the data requested for 2016. This additional data should be included in the Comments section.

Provide flow rate and concentration data in the units specified. If units are not specified, please use the most appropriate units from the acronym list.

When identifying operating units and treatment destinations, use the codes listed on page xiii.

Use the Comments section at the end of Part B to provide additional information as applicable to specific questions within Part B.

You may claim data elements as confidential business information (CBI) if they meet the requirements for CBI claims in 40 CFR 2, Subpart B. See the CBI section of the general data request instructions for details.

Refinery Name:_____

Refinery ID:_____

Section 1: General Unit Operations

B.1 CBI? ☐ Yes

Did the refinery operate one or more of the following units in 2016:

- Crude Desalter
- Catalytic Cracking Unit (CCU)
- Catalytic Reforming Unit (CRU)
- Delayed Coking Unit (DCU)
- Sour Water Stripper (SWS)
- Treatment for crude desalter effluent (prior to the end-of-pipe WWT system)
- Benzene Removal Unit (BRU)
- Granular Activated Carbon (GAC) unit (prior to the end-of-pipe WWT system)
- Other unit to treat pollutants in wastewater prior to the end-of-pipe WWT system

☐ Yes

☐ No ➔ **Skip to Part C**

B.2 CBI? ☐ Yes

Provide a block diagram or diagrams for those units listed in Question B.1 that are operating at your refinery depicting all sources of water, process wastewaters generated, and how they are handled. You may use an existing diagram, such as a water balance diagram included in a permit application, and mark the additional required information on the diagram by hand. You may also use a diagram from previous years, as long as the diagram is still representative of current operations.

Include all items listed in the checklist below on your diagram. Provide as many diagrams as necessary to convey the information requested. Number each block diagram; the first block diagram (BD) should be numbered BD-1, the second BD-2, etc. Include the refinery name and refinery ID of the diagram also.

Block Diagram Checklist

☐ Include the diagram number, refinery name, and refinery identification number (ID) on each diagram submitted.

☐ Include any unit operations listed below that operated at your refinery in 2016. Where multiple units of the same type are present at the refinery (e.g., your refinery operates two CCUs), each should be depicted separately on the diagram and identified.

Unit Operations

- ☐ Crude desalter
- ☐ CCU
- ☐ CRU
- ☐ DCU
- ☐ SWS

Refinery Name:_____

Refinery ID:_____

Block Diagram Checklist (cont.)

Treatment Units Prior to the End-of-Pipe Wastewater Treatment System

- ☐ Treatment for crude desalter effluent
- ☐ BRU
- ☐ GAC
- ☐ Other unit to treat pollutants in wastewater prior to the end-of-pipe wastewater treatment system

☐ Label all water and solid/sludge streams, including but not limited to influent and effluent water and process wastewater streams, for each unit, including any intermittent streams that would affect wastewater characteristics or operation of the end-of-pipe WWT system. See the example diagram for the level of detail requested.

☐ Provide the annual average flow for 2016 in MGD for all streams on the diagram. Please designate those values that are estimates on the diagram(s) by using "(EST)" or a * symbol after the value.

☐ Provide the frequency of discharge for intermittent streams in days per year (DPY) for 2016. Frequency does not have to be provided for continuous streams (i.e., those generated 365 DPY).

☐ Identify the destination of all water and solid/sludge streams. All streams should either be entering another unit shown on the diagram or the next destination should be noted (e.g., note "to end-of-pipe WWT system" on diagram).

☐ Identify any locations where pollutants are routinely monitored for process control. Part B requests information regarding pollutant monitoring locations, when referencing these locations please refer to the name of the location identified on the diagram. For example, if a code system is used (e.g., SP-1, SP-2), please use this same code system to reference monitoring locations when responding to questions such as B.9.

☐ Any streams that are reused or recycled within the refinery should also be included on the diagram and destination noted (e.g., note "stripped sour water to cooling tower").

☐ Include any air pollution control devices installed on each unit identified above.

☐ Include any units used to treat pollutants in wastewater from the unit operations prior to the end-of-pipe WWT system.

☐ Provide treatment unit name or other identifier. Label all locations where wastewater treatment chemicals are added to individual treatment units.

☐ Identify the treatment unit effluent destination. Use the operating units and treatment codes listed on page xiii.

Refinery Name:_____

Refinery ID:_____

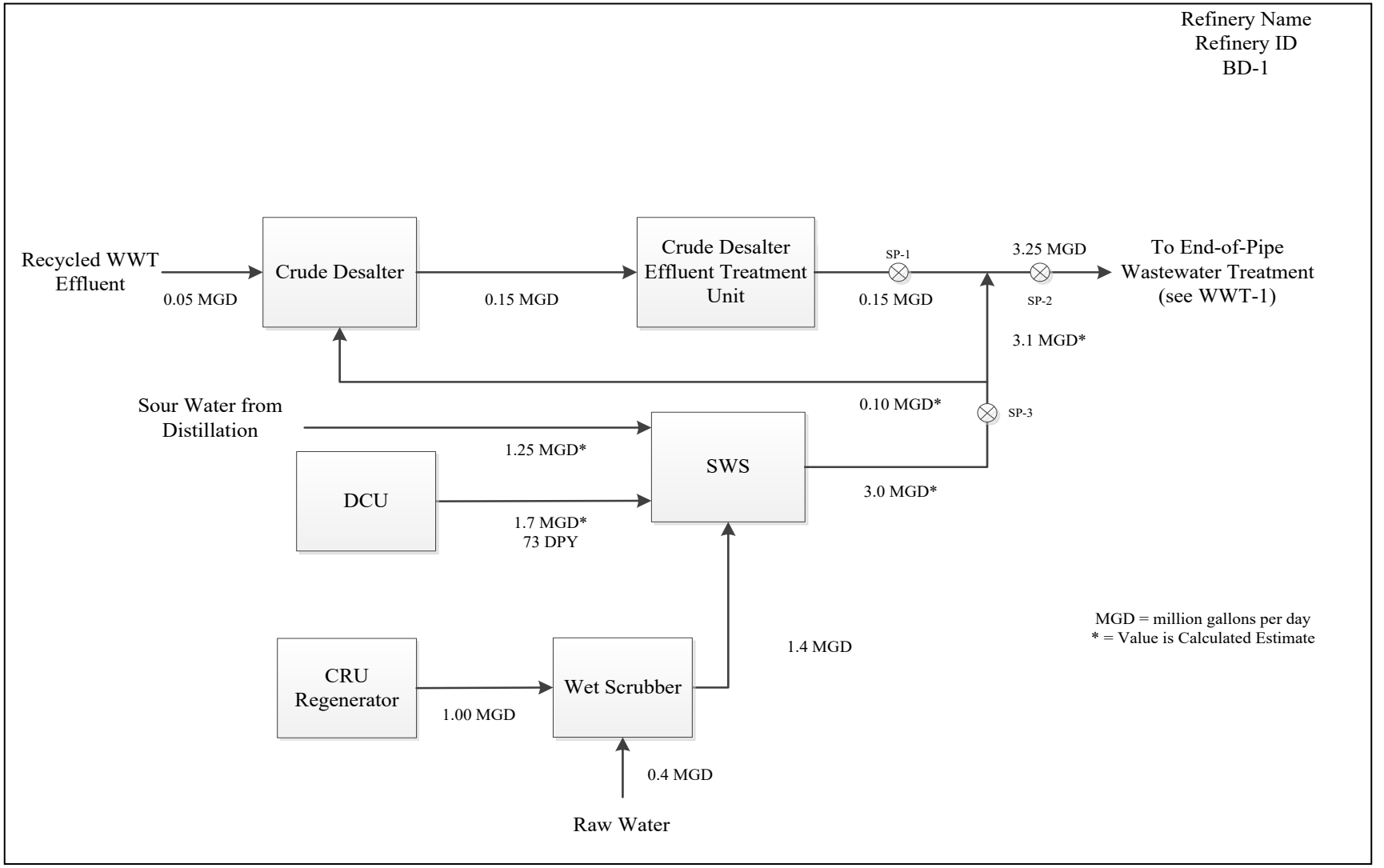

Figure B-1. Example Block Diagram

Refinery Name:_____

Refinery ID:_____

Section 2: Crude Desalter

B.3 CBI? ☐ Yes

Did the refinery operate at least one crude desalter in 2016?

☐ Yes

☐ No ➔ **Skip to Part B Section 3 (Question B.13)**

B.4 CBI? ☐ Yes

Provide the annual average flow of the wastewater generated by the crude desalters (combined) in 2016.

_____ MGD ☐ Est Value

Note: If more than one crude desalter was operated in 2016, provide the cumulative amount of wastewater generated by all units in 2016. This value should match the sum of all crude desalter flows identified on the block diagram submitted in response to Question B.2.

B.5 CBI? ☐ Yes

Identify the destination of the crude desalter effluent. [Select all that apply]

☐	Treatment unit (prior to the end-of pipe WWT system)	_____MGD ☐ Est Value
☐	BRU	_____ MGD ☐ Est Value
☐	Reused or recycled in other operations within the refinery Specify operations: _____	_____ MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____ MGD ☐ Est Value
☐	Other Specify: _____	_____ MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

☐ Other

Specify: _____

_____ MGD ☐ Est Value

Crude Desalter Wastewater Treatment

B.6 CBI? ☐ Yes

Did the refinery treat crude desalter effluent in a unit other than a BRU prior to discharging, reusing, or transferring to the end-of-pipe WWT system (e.g., to remove salts or organics) in 2016?

☐ Yes

☐ No ➔ **Skip to Part B Section 3 (Question B.13)**

B.7 CBI? ☐ Yes

Provide the annual average flow of crude desalter effluent transferred to a treatment unit prior to discharging, reusing, or transferring to the end-of-pipe WWT system in 2016.

_____ MGD ☐ Est Value

B.8 CBI? ☐ Yes

Select the type of treatment unit(s) prior to end-of-pipe WWT system. [Select all that apply]

☐ Oil/water separation (specify type: _____)

☐ Settling

☐ Chemical addition and separation

☐ Media filtration (specify media type: _____)

☐ Membrane filtration (specify type: _____)

☐ Adsorption (specify type:_____)

☐ Ion exchange

☐ Other, specify:

Refinery Name:_____

Refinery ID:_____

B.9 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the treatment unit. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question B.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

B.10 CBI? ☐ Yes

Were any chemicals added to the treatment unit(s), including any chemicals used for pH adjustment?

☐ Yes

☐ No ➔ **Skip to Part B Section 3 (Question B.13)**

B.11 CBI? ☐ Yes

Complete a row in the table below for each chemical added to the treatment unit(s).

Chemical Trade Name	Chemical Manufacturer Name	Purpose of Chemical Addition

Refinery Name:_____

Refinery ID:_____

B.12 CBI? ☐ Yes

Identify the destination of the crude desalter treatment unit effluent after any equalization units. [Select all that apply]

☐	BRU	_____ MGD ☐ Est Value
☐	Reused or recycled in other operations within the refinery Specify operations: _____	_____ MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____ MGD ☐ Est Value
☐	Transferred to a publicly owned treatment works (POTW) or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____ MGD ☐ Est Value
☐	Other treatment unit (provide details in Section 8) Specify:_____	_____ MGD ☐ Est Value
☐	Other Specify:_____	_____ MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 3: CCU

B.13 CBI? ☐ Yes

Did the refinery operate at least one CCU in 2016?

☐ Yes

☐ No ➔ **Skip to Part B Section 4 (Question B.33)**

B.14 CBI? ☐ Yes

How many CCUs did the refinery operate in 2016? _____

Refinery Name:_____

Refinery ID:_____

CCU Number: _____

Please answer a separate copy of Questions B.15 through B.32 (pages 23 through 30) for each CCU your refinery operated in 2016. Please complete a separate set of questions for each CCU. Assign each unit a unique number and label each set of questions with the CCU number in the space provided at the top of each page.

B.15 CBI? ☐ Yes

Provide the actual throughput in 2016.

_____ barrels ☐ Est Value

B.16 CBI? ☐ Yes

Provide the number of days the CCU operated in 2016.

_____ days ☐ Est Value

B.17 CBI? ☐ Yes

Provide the CCU type. [Select one]

☐ Fluid

☐ Thermal

☐ Other: specify _____

B.18 CBI? ☐ Yes

Provide the regenerator combustion type. [Select one]

☐ Complete

☐ Partial

☐ Variable

B.19 CBI? ☐ Yes

Does the CCU have a carbon monoxide (CO) boiler?

☐ Yes

☐ No

Refinery Name:_____

Refinery ID:_____

CCU Number: _____

B.20 CBI? ☐ Yes

In table below, provide information on the air pollution control (APC) on the CCU.

Pollutant	Control Type
Particulate Matter (PM)	☐ None ☐ Wet Electrostatic Precipitator (WESP) ☐ Dry ESP ☐ Fabric/Cartridge Filter (Baghouse) ☐ Dry Scrubber ☐ Wet Scrubber ☐ Cyclone ☐ Water Seal ☐ Chemical Addition (specify type: _____) ☐ Other, specify:
Nitrogen Oxides (NO_X)	☐ None ☐ Selective Catalytic Reduction (SCR) ☐ Selective Non-Catalytic Reduction (SNCR) ☐ Low NO_X burner ☐ LoTO$_X$™ ☐ NO_x Reducing Additives (specify type: _____) ☐ Other, specify:
Sulfur Dioxide (SO_2)	☐ None ☐ Dry Scrubber ☐ Wet Scrubber ☐ SO_2 Reducing Additives (specify type: _____) ☐ Other, specify:

Refinery Name:_____

Refinery ID:_____

CCU Number: _____

B.21 CBI? ☐ Yes

Does the refinery operate a wet scrubber on this CCU?

☐ Yes

☐ No ➔ **Skip to Part B Section 4 (Question B.33)**

B.22 CBI? ☐ Yes

Does more than one CCU use this scrubber?

☐ Yes, enter the CCU number of the other CCU that uses this scrubber _____

☐ No

B.23 CBI? ☐ Yes

Does another unit, other than a CCU, use this scrubber?

☐ Yes, name the unit(s): _____

☐ No

B.24 CBI? ☐ Yes

Complete the following information for this wet scrubber:

Type of Wet Scrubber	**Annual Average Flow of Wastewater Generated in 2016**	**Chemicals Added** (Trade Name and Manufacturer Name)	**Purpose of Chemical Addition**
☐ Caustic ☐ CANSOLV® Scrubber System ☐ LABSORB™ Regenerative Scrubber ☐ Other, specify:	_____MGD ☐ Est Value		

Refinery Name:_____

Refinery ID:_____

CCU Number: _____

B.25 CBI? ☐ Yes

Identify the destination of all wastewater generated by the wet scrubber after any equalization units. [Select all that apply]

☐ Treatment unit (prior to the end-of-pipe WWT system)	_____MGD ☐ Est Value
☐ Reused or recycled in other operations within the refinery Specify operations: _____	_____MGD ☐ Est Value
☐ Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____MGD ☐ Est Value
☐ Transferred to a POTW or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____MGD ☐ Est Value
☐ Other Specify: _____	_____MGD ☐ Est Value
☐ Other Specify: _____	_____MGD ☐ Est Value

CCU APC Wastewater Treatment

B.26 CBI? ☐ Yes

Did the refinery treat any of the wastewater generated by APC equipment prior to discharging, reusing, or transferring to the end-of-pipe WWT system in 2016?

☐ Yes

☐ No ➔ **Skip to Part B Section 4 (Question B.33)**

B.27 CBI? ☐ Yes

Provide the annual average flow of APC wastewater treated in 2016.

_____ MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

CCU Number: _____

B.28 CBI? ☐ Yes

Select the type of treatment unit(s). [Select all that apply]

- ☐ Settling or clarification
- ☐ Chemical addition and separation
- ☐ Media filtration (specify media type: _____)
- ☐ Membrane filtration (specify type: _____)
- ☐ Adsorption (specify type: _____)
- ☐ Ion exchange
- ☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

CCU Number: _____

B.29 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the CCU APC wastewater treatment unit. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference the monitoring locations as they are identified on the block diagram submitted in response to Question B.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

CCU Number: _____

B.30 CBI? ☐ Yes

Were any chemicals added to the treatment unit(s), including chemical used for pH adjustment?

☐ Yes

☐ No ➔ **Skip to Question B.32**

B.31 CBI? ☐ Yes

Complete a row in the table below for each chemical added to the treatment unit(s).

Chemical Trade Name	Chemical Manufacturer Name	Purpose of Chemical Addition

Refinery Name:_____

Refinery ID:_____

CCU Number: _____

B.32 CBI? ☐ Yes

Identify the destination of the treated APC wastewater after any equalization units. [Select all that apply]

☐	SWS	_____MGD ☐ Est Value
☐	Discharged to surface water without further treatment	_____MGD ☐ Est Value
☐	Reused or recycled in other operations within the refinery Specify operations: _____	_____MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____MGD ☐ Est Value
☐	Transferred to a POTW or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____MGD ☐ Est Value
☐	Other treatment unit (provide details in Section 8) Specify: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 4: CRU

B.33 CBI? ☐ Yes

Did the refinery operate at least one CRU in 2016?

☐ Yes

☐ No ➔ **Skip to Part B Section 5 (Question B.53)**

B.34 CBI? ☐ Yes

How many CRUs did the refinery operate in 2016? _____

Refinery Name:_____

Refinery ID:_____

CRU Number: _____

Please answer a separate copy of Questions B.35 through B.52 (pages 32 through 38) for each CRU your refinery operated in 2016. Complete a separate set of questions for each CRU. Assign each unit a unique number and label each page with the CRU number in the space provided at the top of each page.

B.35 CBI? ☐ Yes

Provide the actual throughput in 2016.

_____ barrels ☐ Est Value

B.36 CBI? ☐ Yes

Provide the number of days the CRU operated in 2016.

_____ days ☐ Est Value

B.37 CBI? ☐ Yes

Identify the CRU type. [Select one]

☐ Semi-Regenerative

☐ Cyclic Regenerating

☐ Continuous ➔ **Skip to Question B.41**

B.38 CBI? ☐ Yes

Provide the catalyst regeneration frequency:

_____times per_____ (specify time period e.g., day, month, year)

B.39 CBI? ☐ Yes

Provide the catalyst regeneration length:

_____ hours ☐ Est Value

B.40 CBI? ☐ Yes

Provide the dates of the last 3 catalyst regenerations:

Most Recent Regeneration: _____

Second Most Recent Regeneration: _____

Third Most Recent Regeneration: _____

Refinery Name:_____

Refinery ID:_____

CRU Number: _____

B.41 CBI? ☐ Yes

Identify any APC used during catalyst regeneration. [Select all that apply]

☐ None

☐ Wet Scrubber

☐ Dry Scrubber

☐ Other, specify: _____

B.42 CBI? ☐ Yes

Is wastewater generated by the CRU or CRU APC during the catalyst regeneration process?

☐ Yes

☐ No ➔ **Skip to Part B Section 5 (Question B.53)**

B.43 CBI? ☐ Yes

What was the average flow of wastewater generated during CRU catalyst regeneration and frequency?

_____ MGD ☐ Est Value

_____ days generated ☐ Est Value

Refinery Name:_____

Refinery ID:_____

CRU Number: _____

B.44 CBI? ☐ Yes

Identify the destination of wastewater generated during CRU regeneration after any equalization units. [Select all that apply]

☐	Treatment unit (prior to the end-of-pipe WWT system)	_____MGD ☐ Est Value
☐	SWS	_____MGD ☐ Est Value
☐	Discharged to surface water with no further treatment	_____MGD ☐ Est Value
☐	Reused or recycled in other operations within the refinery Specify operations: _____	_____MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____MGD ☐ Est Value
☐	Transferred to a POTW or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value

CRU Regeneration Wastewater Treatment

B.45 CBI? ☐ Yes

Did the refinery treat any of the wastewater generated by the CRU during catalyst regeneration prior to discharging, reusing, or transferring to the end-of-pipe WWT system?

☐ Yes

☐ No ➔ **Skip to Part B Section 5 (Question B.53)**

Refinery Name:_____

Refinery ID:_____

CRU Number: _____

B.46 CBI? ☐ Yes

Provide the annual average flow of wastewater generated by the CRU during the most recent catalyst regeneration that is treated prior to discharging, reusing, or transferring to the end-of-pipe WWT system. Note: Most recent catalyst regeneration should match the date reported in Question B.40.

_____ MGD ☐ Est Value

B.47 CBI? ☐ Yes

Identify the type of wastewater treated:

☐ Regeneration wastewater (not from APC)

☐ Regeneration APC wastewater

B.48 CBI? ☐ Yes

Select the type of treatment unit(s). [Select all that apply]

☐ Settling

☐ Chemical addition and separation

☐ Media filtration (specify media type: _____)

☐ Membrane filtration (specify type: _____)

☐ Adsorption (specify type: _____)

☐ Ion exchange

☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

CRU Number: _____

B.49 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the CRU regeneration wastewater treatment unit. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question B.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

CRU Number: _____

B.50 CBI? ☐ Yes

Were any chemicals added to the treatment unit(s), including any chemicals used for pH adjustment?

☐ Yes

☐ No ➔ **Skip to Question B.52**

B.51 CBI? ☐ Yes

Complete a row in the table below for each chemical added to the treatment unit(s).

Chemical Trade Name	Chemical Manufacturer Name	Purpose of Chemical Addition

Refinery Name:_____

Refinery ID:_____

CRU Number: _____

B.52 CBI? ☐ Yes

Identify the destination of the treated CRU regeneration wastewater after any equalization units. [Select all that apply]

☐	SWS	_____MGD ☐ Est Value
☐	Discharged to surface water with no further treatment	_____MGD ☐ Est Value
☐	Reused or recycled in other operations within the refinery Specify operations: _____	_____MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____MGD ☐ Est Value
☐	Transferred to a POTW or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____MGD ☐ Est Value
☐	Other treatment unit (provide details in Section 8) Specify: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 5: DCU

B.53 CBI? ☐ Yes

Did the refinery operate at least one DCU in 2016?

☐ Yes

☐ No ➔ **Skip to Part B Section 6 (Question B.59)**

B.54 CBI? ☐ Yes

Identify the source of coke cutting water. [Select all that apply]

☐ Refinery source water (either treated or untreated)

☐ SWS effluent

☐ Refinery end-of-pipe WWT unit (specify unit: _____)

☐ Other, specify: _____

B.55 CBI? ☐ Yes

Provide the annual average flow of coke cutting water used in 2016.

_____ MGD ☐ Est Value

DCU Coke Cutting Wastewater Treatment

B.56 CBI? ☐ Yes

Does the refinery treat wastewater resulting from coke cutting prior to discharging, reusing, or transferring to the end-of-pipe WWT system in 2016?

☐ Yes

☐ No ➔ **Skip to Question B.58**

Refinery Name:_____

Refinery ID:_____

B.57 CBI? ☐ Yes

Identify the type of treatment unit(s). [Select all that apply]

☐ Hydrocyclone

☐ Settling tank

☐ Filtered through coke pile

☐ Media filtration (specify type: _____)

☐ Other, please describe:

B.58 CBI? ☐ Yes

Identify the destination of treated and untreated cutting water after any equalization units. [Select all that apply]

☐	Reused as coke cutting water	_____MGD ☐ Est Value
☐	Discharged to surface water with no further treatment	_____MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____MGD ☐ Est Value
☐	Transferred to a POTW or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 6: SWS

B.59 CBI? ☐ Yes

Did the refinery operate at least one SWS in 2016?

☐ Yes

☐ No ➔ **Skip to Part B Section 7 (Question B.63)**

B.60 CBI? ☐ Yes

Provide the annual average combined flow of SWS effluent in 2016.

_____ MGD ☐ Est Value

Note: If more than one SWS was operated in 2016, provide the cumulative flow for all units in 2016. The value should match the sum of all SWS flows identified on the block diagram submitted in response to Question B.2.

Refinery Name:_____

Refinery ID:_____

B.61 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the SWS bottoms effluent. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question B.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

B.62 CBI? ☐ Yes

Identify the destination of SWS effluent after any equalization units. [Select all that apply]

☐	Discharged to surface water with no further treatment	_____MGD ☐ Est Value
☐	Reused or recycled in other operations within the refinery Specify operations: _____	_____MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____MGD ☐ Est Value
☐	Transferred to a POTW or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____MGD ☐ Est Value
☐	Other treatment unit (provide details in Section 8) Specify: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 7: BRU

B.63 CBI? ☐ Yes

Did the refinery operate at least one BRU prior to the end-of-pipe WWT system in 2016?

☐ Yes

☐ No ➔ **Skip to Part B Section 8 (Question B.69)**

B.64 CBI? ☐ Yes

Provide the annual average flow of influent to the BRU (combined) in 2016.

_____ MGD ☐ Est Value

Note: If more than one BRU was operated in 2016, provide the cumulative flow for all units in 2016. This value should match the sum of all BRU flows identified on the block diagram submitted in response to Question B.2.

Refinery Name:_____

Refinery ID:_____

B.65 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the BRU. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question B.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comment section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

B.66 CBI? ☐ Yes

Were any chemicals added to the BRU, including any chemicals used for pH adjustment?

☐ Yes

☐ No ➔ **Skip to Question B.68**

B.67 CBI? ☐ Yes

Complete a row in the table below for each chemical added to the BRU.

Chemical Trade Name	Chemical Manufacturer Name	Purpose of Chemical Addition

Refinery Name:_____

Refinery ID:_____

B.68 CBI? ☐ Yes

Identify the destination of wastewater exiting the BRU after any equalization units. [Select all that apply]

☐	SWS	_____MGD ☐ Est Value
☐	Discharged to surface water with no further treatment	_____MGD ☐ Est Value
☐	Reused or recycled in other operations within the refinery Specify operations: _____	_____MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____MGD ☐ Est Value
☐	Transferred to a POTW or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____MGD ☐ Est Value
☐	Other treatment unit (provide details in Section 8) Specify:_____	_____MGD ☐ Est Value
☐	Other Specify:_____	_____MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 8: Other Wastewater Treatment Units (prior to the end-of-pipe WWT system)

B.69 CBI? ☐ Yes

Did the refinery operate any other WWT units prior to the end-of-pipe WWT system not captured by other sections of Part B?

☐ Yes

☐ No ➔ **Skip to Part B Section 9 (Question B.77)**

Note: If "other treatment unit" is selected in response to Questions B.12, B.32, B.52, B.62, or B.68 respondents should select Yes. Respondents should also select Yes if any units are used to treat wastewater generated by the crude desalter, CCU, CRU catalyst regenerator, DCU, SWS, or BRU prior to the end-of-pipe wastewater treatment system that were not identified in previous sections of Part B.

Refinery Name:_____

Refinery ID:_____

Other Treatment Unit Number: _____

Please answer a separate copy of Questions B.70 through B.76 (pages 49 through 52) for each other treatment unit(s) receiving process wastewaters your refinery operated in 2016 prior to the end-of-pipe WWT system. Complete a separate set of questions for each other treatment unit(s) prior to the end-of-pipe WWT system not captured in other sections of Part B. Assign each unit(s) a unique number and label each page with the other treatment unit number in the space provided at the top of each page.

Note: Treatment units captured in other sections of Part B include those units treating crude desalter effluent, CCU APC wastewater, CRU regeneration wastewater, DCU coke cutting water, and BRU. Any other treatment unit operated prior to the end-of-pipe WWT system should be identified in this section.

B.70 CBI? ☐ Yes

Identify source(s) of wastewater streams treated by the treatment unit.

B.71 CBI? ☐ Yes

Provide the annual average of wastewater treated by the treatment unit in 2016.

_____ MGD ☐ Est Value

B.72 CBI? ☐ Yes

Select the type of treatment unit(s). [Select all that apply]

☐ Settling

☐ Chemical addition and separation

☐ Media filtration (specify media type: _____)

☐ Membrane filtration (specify type: _____)

☐ Adsorption (specify type: _____)

☐ Ion exchange

☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

Other Treatment Unit Number: _____

B.73 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the other treatment unit. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question B.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

Other Treatment Unit Number: _____

B.74 CBI? ☐ Yes

Were any chemicals added to the treatment unit, including any chemicals used for pH adjustment?

☐ Yes

☐ No ➔ **Skip to Question B.76**

B.75 CBI? ☐ Yes

Complete a row in the table below for each chemical added to the treatment unit.

Chemical Trade Name	Chemical Manufacturer Name	Purpose of Chemical Addition

Refinery Name:_____

Refinery ID:_____

Other Treatment Unit Number: _____

B.76 CBI? ☐ Yes

Identify the destination of wastewater exiting the treatment unit after any equalization units. [Select all that apply]

☐	Discharged to surface water with no further treatment	_____MGD ☐ Est Value
☐	Reused or recycled in other operations within the refinery Specify operations: _____	_____MGD ☐ Est Value
☐	Refinery end-of-pipe WWT system Specify unit (after any equalization units): _____	_____MGD ☐ Est Value
☐	Transferred to a POTW or third party (other nearby facility or other treatment facility) Specify the name of the POTW or third party: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value
☐	Other Specify: _____	_____MGD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 9: Refinery Improvements

B.77 CBI? ☐ Yes

Does the refinery plan to make any improvements to any of the unit operations discussed in this section (e.g., crude desalter, CCU, CRU, DCU, SWS) or treatment units discussed in this section (e.g., BRU, GAC) that would impact the wastewater generated or the management of wastewater between January 1, 2017 and December 31, 2018? This should only include those already under construction/installation or those planned to be under construction/installation by December 31, 2018.

☐ Yes

☐ No ➔ **Skip to Part C**

B.78 CBI? ☐ Yes

For each planned improvement complete a row in the table below to provide details.

Improvement/Change	**Unit Operation or Treatment Unit Affected**	**Expected Date of Completion**	**Description of Improvement/Change** (Including reason for improvement)
Improvement 1			
Improvement 2			
Improvement 3			
Improvement 4			

Refinery Name:_____

Refinery ID:_____

Comments for Part B

Cross reference your comments by question number and indicate the confidential status of your comment by checking (✓) the box in the column titled "CBI" (Confidential Business Information).

Question Number	CBI?	Comment
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	

Refinery Name:_____

Refinery ID:_____

PART C: END-OF-PIPE WASTEWATER TREATMENT SYSTEM

INSTRUCTIONS: Complete Part C of the data request for your refinery.

The U.S. Environmental Protection Agency (EPA) is interested in gathering information specific to the refinery's end-of-pipe wastewater treatment (WWT) system.

Section 2 requests general information about the end-of-pipe WWT system operated at the refinery. All treatment units in the end-of-pipe WWT system should be included on the block diagram requested in Question C.2. Section 2 includes an example block diagram to show the level of detail requested. Not all refineries will be required to complete all sections of Part C. Please follow the instructions and skip patterns to complete specific sections of Part C for your refinery's configuration.

All responses should reflect the 2016 operating year. Refineries are not required to collect any additional data (e.g., sampling data) for the purpose of responding to this data request. Where exact data are not available, use available data to estimate the response based on best judgement. Throughout the data request, identify estimated values using the "Est Value" checkboxes provided. Please include a comment in the Comments section at the end of Part C if you check any "Est Value" box to describe the methodology or calculation used to generate each estimate. If 2016 is not indicative of a normal operating year, respondents may provide data for additional year(s); however, you must still provide data for 2016. Data for years other than 2016 will be considered by EPA in addition to the data requested for 2016. This additional data should be included in the Comments section.

Provide flow rate and concentration data in the units specified. If units are not specified, please use the most appropriate units from the acronym list.

When identifying operating units and treatment destinations, use the codes listed on page xiii.

Use the Comments section at the end of Part C to provide additional information as applicable to specific questions within Part C.

You may claim data elements confidential business information (CBI) if they meet the requirements for CBI claims in 40 CFR 2, Subpart B. See the CBI section of the general data request instructions for details.

Refinery Name:_____

Refinery ID:_____

Section 1: General Wastewater Treatment Unit Data

End-of-pipe wastewater treatment system refers to the combination of wastewater treatment units that treat the combined wastewater flow at a refinery (e.g., end-of-pipe wastewater treatment units generally begin with the forebay of the primary oil/water separation unit and end at the point of discharge).

C.1 CBI? ☐ Yes

Does the refinery operate an end-of-pipe WWT system?

☐ Yes

☐ No

If you responded "No" to Question C.1, and do not operate an end-of-pipe WWT system, do not complete the remainder of Part C of the data request.

Refinery Name:_____

Refinery ID:_____

Section 2: End-of-Pipe Wastewater Treatment

C.2 CBI? ☐ Yes

Provide a block diagram or diagrams depicting the end-of-pipe WWT in place at your refinery. You may use an existing diagram, such as a water balance diagram included in a permit application, and mark the additional required information on the diagram by hand. You may also use a diagram from previous years, as long as the diagram is still representative of current operations.

Include all items listed in the checklist below on your diagram. Provide as many diagrams as necessary to convey the information requested. Number each block diagram in; the first block diagram should be numbered WWT-1, the second numbered WWT-2, etc. Include the refinery name and identification number (ID) in the diagram.

Refinery Name:_____

Refinery ID:_____

WWT Block Diagram Checklist

- ☐ Include the wastewater treatment diagram number, refinery name, and refinery ID on each diagram submitted.
- ☐ Include all treatment units in the end-of-pipe WWT system operated at your refinery in 2016. Where multiple units of the same type are present at the refinery (e.g., your refinery operates two clarifiers), each should be depicted separately on the diagram and identified.
- ☐ Label all water and solid/sludge streams, including but not limited to influent and effluent water and process wastewater streams, for each treatment unit, including any intermittent streams. See the example diagram for the level of detail requested.
- ☐ Include any non-process wastewater including, but not limited to, those from off-site locations or third parties. Specify the name of the facility and source of wastewater received clearly on the diagram (e.g., third party process wastewater).
- ☐ Provide the annual average flow for 2016 in MGD for all streams on the diagram. Please designate those values that are estimates on the diagram(s) by using "(EST)" or a * symbol after the value.
- ☐ Provide the frequency of discharge for intermittent streams in days per year (DPY) for 2016. Frequency does not have to be provided for continuous streams (i.e., those generated 365 DPY).
- ☐ Identify the destination of all water and solid streams leaving the end-of-pipe WWT system. All streams should either be entering another unit shown on the diagram or the next destination should be noted (e.g., Outfall 001, off-site for disposal).
- ☐ Any streams that are reused or recycled within the refinery should also be included on the diagram and destination noted. Use unit operations and treatment codes listed on page xiii.
- ☐ Identify any pollutant monitoring locations. Part C requests information regarding pollutant monitoring locations, when referencing these locations please refer to the name of the location identified on the diagram. For example, if a code system is used (e.g., SP-1, SP-2), please use this same code system to reference monitoring locations when responding to questions such as C.15.

Refinery Name:_____

Refinery ID:_____

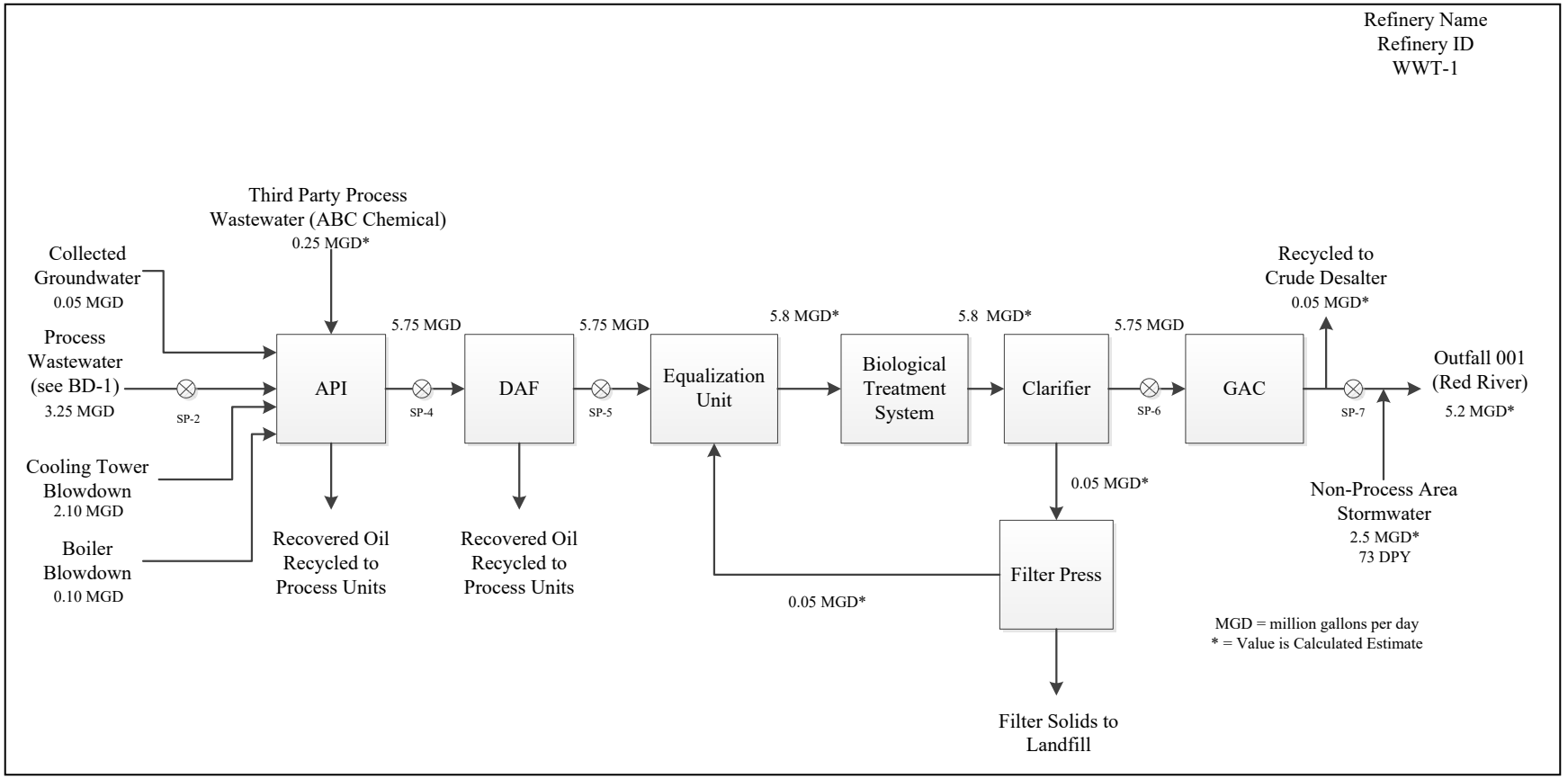

Figure C-1. Example Block Diagram

Refinery Name:_____

Refinery ID:_____

C.3 CBI? ☐ Yes

Complete the table below to identify the sources of wastewater entering the end-of-pipe WWT system, and identify the treatment unit that receives the stream using the treatment codes listed on page xiii.

Influent streams to the end-of-pipe WWT system, flow rates, and treatment units must match those indicated and labeled on your end-of-pipe WWT diagram (see Question C.2). ***Note***: Refineries are not required to list influent streams to individual treatment units in the system (e.g., you do not need to include the effluent from an API separator which is the influent to the dissolved gas flotation (DGF)) only those streams first entering the end-of-pipe WWT system. You do not need to include streams recycled within the end-of-pipe WWT (e.g., the filtrate stream in the example diagram from the filter press to the equalization unit). Only those streams entering the WWT system need to be identified (e.g., the third-party process wastewater, collected groundwater, process wastewater, cooling tower blowdown, boiler blowdown, and non-process area stormwater from Figure C-1.).

Influent Stream	Annual Average Flow in 2016	Treatment Unit That Receives Influent
Example: Process Wastewater	***3.25 MGD ☐ Est Value***	***API***
Process wastewater	_____ MGD ☐ Est Value	
Non-process wastewater	_____ MGD ☐ Est Value	
Process area stormwater	_____ MGD ☐ Est Value	
Non-process area stormwater	_____ MGD ☐ Est Value	
Sanitary wastewater	_____ MGD ☐ Est Value	
Cooling water	_____ MGD ☐ Est Value	
Cooling tower blowdown	_____ MGD ☐ Est Value	
Boiler blowdown	_____ MGD ☐ Est Value	
Third party process wastewater	_____ MGD ☐ Est Value	
Third party non-process wastewater	_____ MGD ☐ Est Value	
Other, specify: _____ _____	_____ MGD ☐ Est Value	
Other, specify: _____ _____	_____ MGD ☐ Est Value	
Other, specify: _____ _____	_____ MGD ☐ Est Value	
Other, specify: _____ _____	_____ MGD ☐ Est Value	
Other, specify: _____ _____	_____ MGD ☐ Est Value	

Refinery Name:_____

Refinery ID:_____

C.4 CBI? ☐ Yes

Complete a row in the table below for each water stream exiting the end-of-pipe WWT system, and identify the treatment unit that generates the effluent stream using the treatment codes listed on page xiii.

End-of-pipe WWT system effluent streams, flow rates, and treatment units must match those indicated and labeled on your end-of-pipe WWT diagram (see Question C.2). Enter the destination of the effluent stream excluding any equalization units. ***Note***: Refineries are not required to list effluent from individual treatment units, only those streams exiting the end-of-pipe WWT system. You do not need to include streams recycled within the end-of-pipe WWT (e.g., the filtrate stream in the example diagram from the filter press to the equalization unit). Only those streams exiting the WWT system need to be identified (e.g., treated wastewater recycled to the crude desalter and final effluent to Outfall 001 from Figure C-1.).

Effluent Stream Name	**Annual Average Flow in 2016**	**Treatment Unit Generating the Effluent**	**Destination** (after any equalization units)
Example: Effluent 1	***5.2*** MGD ☒ Est Value	***GAC***	☒ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____
Example: Effluent 2	***0.05*** MGD ☒ Est Value	***GAC***	☐ Discharged to surface water ☐ Discharged to POTW/third party ☒ Recycled/reused, specify operation: ***Crude desalter*** ☐ Other, specify: _____
Effluent 1	_____ MGD ☐ Est Value		☐ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____
Effluent 2	_____ MGD ☐ Est Value		☐ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

Effluent Stream Name	Annual Average Flow in 2016	Treatment Unit Generating the Effluent	Destination (after any equalization units)
Effluent 3	_____ MGD ☐ Est Value		☐ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____
Effluent 4	_____ MGD ☐ Est Value		☐ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____
Effluent 5	_____ MGD ☐ Est Value		☐ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____
Effluent 6	_____ MGD ☐ Est Value		☐ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____
Effluent 7	_____ MGD ☐ Est Value		☐ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____
Effluent 8	_____ MGD ☐ Est Value		☐ Discharged to surface water ☐ Discharged to POTW/third party ☐ Recycled/reused, specify operation: _____ ☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

C.5 CBI? ☐ Yes

Complete a row in the table below for each solid/sludge generated by the end-of-pipe WWT system. Identify the 2016 annual generation rate for each sludge on a dry basis and the treatment unit generating the sludge using the treatment codes listed on page xiii. End-of-pipe WWT system sludge streams must match those indicated and labeled on your end-of-pipe WWT diagram (see Question C.2).

Solid/Sludge	Average Generation Rate in 2016 (dry basis)	Treatment Unit Generating Residual
Example: Sludge 1	***2,000 tons ☐ Est Value***	***Filter press***
Sludge 1	_____ tons ☐ Est Value	
Sludge 2	_____ tons ☐ Est Value	
Sludge 3	_____ tons ☐ Est Value	
Sludge 4	_____ tons ☐ Est Value	
Sludge 5	_____ tons ☐ Est Value	
Sludge 6	_____ tons ☐ Est Value	
Sludge 7	_____ tons ☐ Est Value	
Sludge 8	_____ tons ☐ Est Value	

Refinery Name:_____

Refinery ID:_____

C.6 CBI? ☐ Yes

Complete a row in the table below for each chemical added to the end-of-pipe WWT system.

Chemical Trade Name	Chemical Manufacturer Name	Treatment Unit	Purpose of Chemical Addition	Annual Average Addition Rate
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value
				10 GPD ☐ Est Value

Refinery Name:_____

Refinery ID:_____

C.7 CBI? ☐ Yes

Identify what pollutants the refinery routinely monitors during operation of the end-of-pipe WWT system (i.e., those pollutants the refinery uses as indicators to determine if the WWT system is operating properly or within normal ranges). [Select all that apply]

☐ Metals (specify) _____
☐ Total suspended solids (TSS)
☐ Total dissolved solids (TDS)
☐ Chemical oxygen demand (COD)
☐ Biochemical oxygen demand (BOD)
☐ Total organic carbon (TOC)
☐ Oil and grease
☐ Nitrogen compounds (ammonia, nitrate, nitrite, total Kjeldahl nitrogen (TKN), total N)
☐ Phosphorus
☐ Organics (specify) _____
☐ Other, explain: _____

C.8 CBI? ☐ Yes

What is the annual average hydraulic residence time for the entire end-of-pipe WWT system?

_____ hours ☐ Est Value

C.9 CBI? ☐ Yes

Does the refinery plan to make any improvements to the end-of-pipe WWT system that would impact the wastewater generated or the management of wastewater between January 1, 2017 and December 31, 2018? This should only include those already under construction/installation or those planned to be under construction/installation by December 31, 2018.

☐ Yes

☐ No ➔ **Skip to Part C Section 3 (Question C.11)**

Refinery Name:_____

Refinery ID:_____

C.10 CBI? ☐ Yes

For each planned improvement and/or change to the management of wastewater, complete a row in the table below to provide details.

Improvement/Change	Unit Operation or Treatment Unit Affected	Expected Date of Completion	Description of Improvement/Change (Including reason for improvement)
Improvement 1			
Improvement 2			
Improvement 3			
Improvement 4			

Section 3: Oil/Water Separation

C.11 CBI? ☐ Yes

Did the refinery operate at least one oil/water separation unit as part of the end-of-pipe WWT system in 2016?

☐ Yes

☐ No ➔ **Skip to Part C Section 4 (Question C.17)**

C.12 CBI? ☐ Yes

How many oil/water separation units are part of the end-of-pipe WWT system?

_____

Note: Multiple oil/water separation units configured in parallel should be considered as one unit. For example, if you operate two API separators in parallel followed by three dissolved air flotation units in parallel, this should be counted as two oil/water separation units.

Refinery Name:_____

Refinery ID:_____

Oil/Water Separation Unit Number:_____

Please answer a separate copy of Questions C.13 through C.16 (pages 67 through 69) for each oil/water separation unit your refinery operated as a part of end-of-pipe WWT system in 2016. Complete a separate set of questions for each oil/water separation unit. Assign each unit a unique number and label each page with the oil/water separation unit number in the space provided at the top of each page.

C.13 CBI? ☐ Yes

Provide the annual average flow of wastewater entering the oil/water separation unit in 2016.

_____ MGD ☐ Est Value

Note: If multiple separation units are operated in parallel, provide the cumulative flow of wastewater.

C.14 CBI? ☐ Yes

Identify the type of oil/water separation unit. [Select one]

☐ API Separator or Similar Gravity Separator

☐ Corrugated Plate Interceptor (CPI)

☐ Dissolved Air Flotation (DAF)

☐ Dissolved Gas Flotation (DGF) (specify type of gas: _____)

☐ Induced Air Flotation (IAF)

☐ Induced Gas Flotation (IGF) (specify type of gas: _____)

☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

Oil/Water Separation Unit Number:_____

C.15 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the oil/water separation unit. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question C.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

Oil/Water Separation Unit Number:_____

C.16 CBI? ☐ Yes

Identify the destination of the recovered oil stream (after any equalization units). [Select all that apply]

☐ Recycled to refinery process units for further processing

☐ Transferred to third party for further processing or disposal

☐ Other, specify:

Refinery Name:_____

Refinery ID:_____

Section 4: Biological Treatment and Clarification

C.17 CBI? ☐ Yes

Did the refinery operate at least one biological treatment system in 2016?

☐ Yes

☐ No ➔ **Skip to Part C Section 5 (Question C.23)**

C.18 CBI? ☐ Yes

How many different biological treatment systems are part of the refinery's end-of-pipe WWT system?

_____

Note: Biological treatment systems should be differentiated by the technologies employed to achieve treatment or removals. For example, if a refinery operates a tank-based activated sludge system in parallel with an aerobic impoundment, these should be considered two different biological treatment systems.

Refinery Name:_____

Refinery ID:_____

Biological Treatment System Number:_____

Please answer a separate copy of Questions C.19 through C.22 (pages 71 through 74) for each biological treatment system your refinery operated as a part of end-of-pipe WWT system in 2016. Complete a separate set of questions for each biological treatment system. Assign each treatment system a unique number and label each page with the biological treatment system number in the space provided in the top right of each page.

C.19 CBI? ☐ Yes

Provide the annual average flow of wastewater entering the biological treatment system in 2016.

_____ MGD ☐ Est Value

Note: If multiple biological treatment systems utilizing the same technology are operated in parallel, provide the cumulative flow of wastewater.

C.20 CBI? ☐ Yes

Identify the treatment units within the biological treatment and clarification system (after any equalization units). Provide the average annual residence time in hours for each unit selected. Where two units are in parallel, provide the longest average residence time. [Select all that apply]

☐	Tank-based activated sludge	_____hours ☐ Est Value
☐	Aerobic impoundment	_____hours ☐ Est Value
☐	Membrane Bioreactor (MBR)	_____hours ☐ Est Value
☐	Moving Bed Bioreactor or Moving Bed Bioflim Reactor (MBBR)	_____hours ☐ Est Value
☐	Other aerobic unit Specify: _____	_____hours ☐ Est Value
☐	Anaerobic MBR	_____hours ☐ Est Value
☐	Anaerobic impoundment	_____hours ☐ Est Value
☐	Tank-based anaerobic unit	_____hours ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Biological Treatment System Number:_____

☐	Other anaerobic unit Specify: _____	_____hours ☐ Est Value
☐	Other biological treatment unit Specify: _____	_____hours ☐ Est Value
☐	Lamella (inclined-plate) clarifier	_____hours ☐ Est Value
☐	Other clarifier Specify: _____	_____hours ☐ Est Value
☐	Other unit Specify: _____	_____hours ☐ Est Value
☐	Other unit Specify: _____	_____hours ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Biological Treatment System Number:_____

C.21 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the biological treatment system. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question C.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

Biological Treatment System Number:_____

C.22 CBI? ☐ Yes

For those refineries operating a clarifier, provide the average age of the sludge in the clarifier.

☐ No clarifier

☐ _____ days ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Section 5: Filtration and Adsorption

C.23 CBI? ☐ Yes

Did the refinery operate, as part of the end-of-pipe WWT system, at least one filtration or adsorption unit in 2016?

☐ Yes

☐ No ➔ **Skip to Part C Section 6 (Question C.28)**

C.24 CBI? ☐ Yes

How many different types of filtration or adsorption units are part of the refinery's end-of-pipe WWT system?

_____

Note: Filtration and adsorption units should be differentiated by their type and purpose and/or level of treatment. For example, if the refinery operates three separate GAC units in parallel, splitting the wastewater flow between the units and all units are targeting the same pollutant concentration these should be considered as one filtration unit. Alternatively, if the refinery operates a sand filter to target TSS and a GAC to target selenium these should be considered as one filtration unit and one adsorption unit.

Refinery Name:_____

Refinery ID:_____

Filtration/Adsorption Unit Number:_____

Please answer a separate copy of Questions C.25 through C.27 (pages 76 through 77) for each filtration or adsorption unit your refinery operated as a part of end-of-pipe WWT system in 2016. Complete a separate set of questions for each filtration or adsorption unit. Assign each unit a unique number and label each page with the filtration/adsorption unit number in the space provided in the top right of each page.

C.25 CBI? ☐ Yes

Provide the annual average flow of wastewater entering the filtration or adsorption in 2016.

_____ MGD ☐ Est Value

Note: If multiple filtration or adsorption units are operated in parallel, provide the cumulative flow of wastewater.

C.26 CBI? ☐ Yes

Identify the type of filtration or adsorption unit(s) and provide the average annual residence time in hours. Where two units are in parallel, provide the longest average residence time.

☐	Media Filtration (specify media type: _____)	_____hours ☐ Est Value
☐	GAC	_____hours ☐ Est Value
☐	Other, specify: _____	_____hours ☐ Est Value

Refinery Name:_____

Refinery ID:_____

Filtration/Adsorption Unit Number:_____

C.27 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the filtration/adsorption unit. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question C.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

Section 6: Other Treatment Units

C.28 CBI? ☐ Yes

Did the refinery operate any additional treatment units used to treat process wastewater for specific pollutants as part of the end-of-pipe WWT system in 2016 that are not otherwise captured in Sections 3 through 5?

☐ Yes

☐ No

If you responded "No" to Question C.28, and do not operate any additional treatment units as part of the end-of-pipe WWT system, do not complete the remainder of Part C of the data request.

Refinery Name:_____

Refinery ID:_____

Other Treatment Unit Number:_____

Please answer a separate copy of Questions C.29 through C.32 (pages 79 through 81) for each additional treatment unit used to treat process wastewater for a specific pollutant that your refinery operated as a part of end-of-pipe WWT system in 2016. Complete a separate set of questions for each unit. Assign each unit a unique number and label each page with the other treatment unit number in the space provided in the top right of each page.

C.29 CBI? ☐ Yes

Provide the annual average flow wastewater entering the other treatment unit in 2016.

_____ MGD ☐ Est Value

Note: If multiple units are operated in parallel, provide the cumulative flow of wastewater.

C.30 CBI? ☐ Yes

Identify the type of treatment unit. [Select one]

☐ Settling

☐ Chemical addition and separation

☐ Ion exchange

☐ Reverse osmosis

☐ Neutralization unit

☐ Other, specify: _____

Refinery Name:_____

Refinery ID:_____

Other Treatment Unit Number:_____

C.31 CBI? ☐ Yes

Identify all pollutants routinely monitored for process control of the other treatment unit. Complete a row in the table below to identify the 2016 average, minimum, and maximum concentrations. List each pollutant in a separate row of the table. Please reference monitoring locations as they are identified on the block diagram submitted in response to Question C.2.

Note: Specify all concentrations in mg/L where possible. All non-detect concentrations should be treated as a zero when calculating average concentrations. Use the Comments section if additional space is needed.

Pollutant	Monitored in Influent or Effluent of Unit [Select One]	2016 Average Concentration	2016 Minimum Concentration	2016 Maximum Concentration	Units	Analytical Method	Follows 40 CFR 136 sampling, testing, & QA/QC requirements	Monitoring Location
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	
	☐ Influent ☐ Effluent						☐ No ☐ Yes	

Refinery Name:_____

Refinery ID:_____

Other Treatment Unit Number:_____

C.32 CBI? ☐ Yes

If the refinery did not install the treatment unit to specifically target a particular pollutant or pollutants, please use the space below to indicate the purpose or reason for installing and operating the treatment unit(s). In your description, please be as specific as possible.

Refinery Name:_____

Refinery ID:_____

Comments for Part C

Cross reference your comments by question number and indicate the confidential status of your comment by checking (✓) the box in the column titled "CBI" (Confidential Business Information).

Question Number	CBI?	Comment
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	
	☐ Yes	