Lyondell Chemical Company
Channelview South Plant
TPDES WQ0002927000 Application 2020

Application Contents

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Reference Key

AR1.0	Administrative Report 1.0
AR1.1	Administrative Report 1.1
TR	Technical Report
SPIF	Supplemental Permit Information Form
W#	Worksheet #

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

TCEQ INDUSTRIAL WASTEWATER PERMIT APPLICATION

INDUSTRIAL ADMINISTRATIVE REPORT

Complete and submit this checklist with the application.

APPLICANT NAME: Lyondell Chemical Company

PERMIT NUMBER: WQ0002927000

Check Y for each of the following items included in this application. If an item was not included, check N.

	Y	N		Y	N
Administrative Report 1.0	☒	☐	Worksheet 8.0	☐	☒
Administrative Report 1.1	☒	☐	Worksheet 9.0	☐	☒
SPIF	☒	☐	Worksheet 10.0	☐	☒
Core Data Form	☒	☐	Worksheet 11.0	☐	☒
Technical Report 1.0	☒	☐	Worksheet 11.1	☐	☒
Worksheet 1.0	☒	☐	Worksheet 11.2	☐	☒
Worksheet 2.0	☒	☐	Worksheet 11.3	☐	☒
Worksheet 3.0	☐	☒	Original USGS Map	☒	☐
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Worksheet 6.0	☐	☒	Water Balance	☒	☐
Worksheet 7.0	☐	☒			

For Commission Use Only:
Segment Number: _____ County: _____ Expiration Date: _____
Proposed/Current Permit Number: _____ Region: _____

INDUSTRIAL ADMINISTRATIVE REPORT 1.0

The following information **is required** for **all** applications for TPDES permits and TLAPs.

1. TYPE OF APPLICATION AND FEES (Instructions, Page 21)

a. Permit No.: WQ0002927000 Expiration Date: July 1, 2021

EPA ID No.: TX0069493

b. Check the box next to the appropriate application type.

- ☐ New TPDES permit
- ☒ Major amendment with renewal
- ☐ Renewal with changes
- ☐ Minor amendment without renewal
- ☐ Stormwater only discharge
- ☐ New TLAP permit
- ☐ Major amendment without renewal
- ☐ Renewal without changes
- ☐ Minor modification without renewal

c. If applying for an **amendment** or **modification** of a permit, describe the request in detail: See Technical Report, Item 13.

d. Application Fee

Check the box next to the amount submitted for the application fee:

EPA Classification	New	Major Amendment (With or Without Renewal)	Renewal (With or Without Changes)	Minor Amendment/ Minor Modification (Without Renewal)
Minor facility not subject to EPA categorical effluent guidelines (*40 CFR Parts 400-471*)	☐ $350	☐ $350	☐ $315	☐ $150
Minor facility subject to EPA categorical effluent guidelines (*40 CFR Parts 400-471*)	☐ $1,250	☐ $1,250	☐ $1,215	☐ $150
Major facility	N/A *	☒ $2,050	☐ $2,015	☐ $450

* All facilities are designated as minors until formally classified as a major by EPA.

e. Payment Information:

Mailed Check or money order number: N/A

Check or money order amount: N/A

Named printed on check or money order: N/A

ePAY Voucher number: WRS0024500

Copy of voucher attached? ☒ Yes **Attachment**: A-6 Fee Payment Receipt (total of $2,100.00, an additional $50 is required because there are more than 100 adjacent landowners)

2. APPLICANT INFORMATION (Instructions, Pages 21-22)

a. Facility Owner (Owner of the facility must apply for the permit.)

- Provide the legal name of the entity (applicant) applying for this permit: Lyondell Chemical Company

  (The legal name must be spelled exactly as filed with the TX SOS, Texas Comptroller of Public Accounts, County, or in the legal documents forming the entity.)

- If the applicant is currently a customer with the TCEQ, provide the Customer Number, which can be located using the TCEQ's Central Registry Customer Search[1]: **CN**600344402

- Provide the name and title of the person signing the application. The person must be an executive official meeting signatory requirements in *30 TAC § 305.44*.

  Mr. ☒ Ms. ☐ First/Last Name: Christopher M. Cain

  Title: Site Manager Credential: See Attachment A-2 for delegation of authority for signature.

b. Co-applicant Information

- Provide the legal name of the co-applicant applying for this permit, if applicable: N/A

  (The legal name must be spelled exactly as filed with the TX SOS, Texas Comptroller of Public Accounts, County, or in the legal documents forming the entity.)

- If the co-applicant is currently a customer with the TCEQ, provide the Customer Number, which can be located using the TCEQ's Central Registry Customer Search: **CN** Click to enter text

- Provide the name and title of the person signing the application. The person must be an executive official meeting signatory requirements in *30 TAC § 305.44*.

  Mr. ☐ Ms. ☐ First/Last Name: Click to enter text

  Title: Click to enter text Credential: Click to enter text

- Provide a brief description of the need for a co-permittee: Click to enter text

c. Core Data Form

Complete the Core Data Form for each customer and include as an attachment. If the customer type selected on the Core Data Form is **Individual**, complete **Attachment 1** of the Administrative Report.

Attachment: A-1 Core Data Form

3. APPLICATION CONTACT INFORMATION (Instructions, Page 22)

If the TCEQ needs additional information regarding this application, who should be contacted?

a. Mr. ☐ Ms. ☒ First/Last Name: Nancy Ross Credential: Click to enter text

Organization Name: Lyondell Chemical Company Title: Senior Environmental Engineer

Mailing Address: P.O. Box 777 City/State/ZIP Code: Channelview, TX 77530-0777

Phone No.: 281-452-8722 Fax No.: N/A E-mail: Nancy.Ross@lyondellbasell.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

[1] http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch

b. Mr. ☐ Ms. ☐ First/Last Name: N/A Credential: Click to enter text.

Organization Name: Click to enter text. Title: Click to enter text.

Mailing Address: Click to enter text. City/State/ZIP Code: Click to enter text.

Phone No.: Click to enter text. Fax No.: Click to enter text. E-mail: Click to enter text.

Check one or both: ☐ Administrative Contact ☐ Technical Contact

Attachment: N/A

4. PERMIT CONTACT INFORMATION (Instructions, Page 22)

Provide two names of individuals that can be contacted throughout the permit term.

a. Mr. ☐ Ms. ☒ First/Last Name: Nancy Ross Credential: Click to enter text.

Organization Name: Lyondell Chemical Company Title: Senior Environmental Engineer

Mailing Address: P.O. Box 777 City/State/ZIP Code: Channelview, TX 77530-0777

Phone No.: 281-452-8722 Fax No.: N/A E-mail: Nancy.Ross@lyondellbasell.com

b. Mr. ☒ Ms. ☐ First/Last Name: Scott Mayo Credential: Click to enter text.

Organization Name: Lyondell Chemical Company Title: Environmental Manager

Mailing Address: P.O. Box 777 City/State/ZIP Code: Channelview, TX 77530-0777

Phone No.: 281-452-8109 Fax No.: N/A E-mail: Randall.Mayo@lyondellbasell.com

Attachment: N/A

5. BILLING CONTACT INFORMATION (Instructions, Page 22)

The permittee is responsible for paying the annual fee. The annual fee will be assessed to permits **in effect on September 1 of each year**. *The TCEQ will send a bill to the address provided in this section. The permittee is responsible for terminating the permit when it is no longer needed (form TCEQ-20029).*

Provide the complete mailing address where the annual fee invoice should be mailed and the name and phone number of the permittee's representative responsible for payment of the invoice.

Mr. ☐ Ms. ☒ First/Last Name: Nancy Ross Credential: Click to enter text.

Organization Name: Lyondell Chemical Company Title: Senior Environmental Engineer

Mailing Address: P.O. Box 777 City/State/ZIP Code: Channelview, TX 77530-0777

Phone No.: 281-452-8722 Fax No.: N/A E-mail: Nancy.Ross@lyondellbasell.com

6. DMR/MER CONTACT INFORMATION (Instructions, Page 22)

Provide the name and mailing address of the person delegated to receive and submit DMRs or MERs.

Mr. ☐ Ms. ☒ First/Last Name: Nancy Ross Credential: Click to enter text.

Organization Name: Lyondell Chemical Company Title: Senior Environmental Engineer

Mailing Address: P.O. Box 777 City/State/ZIP Code: Channelview, TX 77530-0777

Phone No.: 281-452-8722 Fax No.: N/A E-mail: Nancy.Ross@lyondellbasell.com

DMR data must be submitted through the NetDMR[2] system. An electronic reporting account can be established once the facility has obtained the permit number.

7. NOTICE INFORMATION (Instructions, Pages 23-24)

a. Individual Publishing the Notices

Mr. ☐ Ms. ☒ First/Last Name: Nancy Ross Credential: Click to enter text.

Organization Name: Lyondell Chemical Company Title: Senior Environmental Engineer

Mailing Address: P.O. Box 777 City/State/ZIP Code: Channelview, TX 77530-0777

Phone No.: 281-452-8722 Fax No.: N/A E-mail: Nancy.Ross@lyondellbasell.com

b. Method for Receiving Notice of Receipt and Intent to Obtain a Water Quality Permit Package (only for NORI, NAPD will be sent via regular mail)

☒ E-mail: Nancy.Ross@lyondellbasell.com

☐ Fax: Click to enter text.

☐ Regular Mail (USPS)

Mailing Address: Click to enter text. City/State/ZIP Code: Click to enter text.

c. Contact in the Notice

Mr. ☐ Ms. ☒ First/Last Name: Nancy Ross Credential: Click to enter text.

Organization Name: Lyondell Chemical Company Title: Senior Environmental Engineer

Phone No.: 281-452-8722 Fax No.: N/A E-mail: Nancy.Ross@lyondellbasell.com

d. Public Place Information

If the facility or outfall is located in more than one county, provide a public viewing place for each county.

Public building name: Due to Covid restrictions, online access will be provided at https://www.lyondellbasell.com/en/channelview-complex/ Location within the building: N/A

Physical Address of Building: N/A

City: N/A County: N/A

e. Bilingual Notice Requirements:

This information **is required** for **new, major amendment, and renewal applications**. It is not required for minor amendment or minor modification applications.

This section of the application is only used to determine if alternative language notices will be needed. Complete instructions on publishing the alternative language notices will be in your public notice package.

Please call the bilingual/ESL coordinator at the nearest elementary and middle schools and obtain the following information to determine whether an alternative language notices are required.

[2] https://www.tceq.texas.gov/permitting/netdmr

1. Is a bilingual education program required by the Texas Education Code at the elementary or middle school nearest to the facility or proposed facility?

   ☒ Yes ☐ No

   If **no**, publication of an alternative language notice is not required; **skip to** Item 8 (REGULATED ENTITY AND PERMITTED SITE INFORMATION.)

2. Are the students who attend either the elementary school or the middle school enrolled in a bilingual education program at that school?

   ☒ Yes ☐ No

3. Do the students at these schools attend a bilingual education program at another location?

   ☐ Yes ☒ No

4. Would the school be required to provide a bilingual education program but the school has waived out of this requirement under 19 TAC §89.1205(g)?

   ☐ Yes ☒ No

5. If the answer is yes to question 1, 2, 3, or 4, public notices in an alternative language are required. Which language is required by the bilingual program? Spanish

8. REGULATED ENTITY AND PERMITTED SITE INFORMATION (Instructions Pages 24-25)

If the site of your business is part of a larger business site, a Regulated Entity Number (RN) may already be assigned for the larger site. Use the RN assigned for the larger site. Search the TCEQ's Central Registry[3] to determine the RN or to see if the larger site may already be registered as a regulated site:

If the site is found, provide the assigned RN and the information for the site to be authorized through this application below. The site information for this authorization may vary from the larger site information.

a. TCEQ issued Regulated Entity Number (RN): **RN**100633650

b. Name of project or site (the name known by the community where located): Lyondell Chemical Channelview

c. Is the location address of the facility in the existing permit the same?

   ☒ Yes ☐ No

d. If the facility is located in Bexar, Comal, Hays, Kinney, Medina, Travis, Uvalde, or Williamson County, additional information concerning protection of the Edwards Aquifer may be required.

e. Owner of treatment facility: Lyondell Chemical Company

   Ownership of Facility: ☐ Public ☒ Private ☐ Both ☐ Federal

f. Owner of land where treatment facility is or will be:

   Mr. ☐ Ms. ☐ First/Last or Organization Name: Lyondell Chemical Company

   Mailing Address: P.O. Box 777 City/State/ZIP Code: Channelview, TX 77530-0777

   Phone No.: 281-862-5026 Fax No.: N/A E-mail: Christopher.Cain@lyondellbasell.com

[3] http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=regent.RNSearch

If not the same as the facility owner, there must be a long-term lease agreement in effect for at least six years. In some cases, a lease may not suffice - see instructions. **Attachment:** N/A

g. Owner of effluent TLAP disposal site (if applicable):

Mr. ☐ Ms. ☐ First/Last or Organization Name: N/A

Mailing Address: Click to enter text. City/State/ZIP Code: Click to enter text.

Phone No.: Click to enter text. Fax No.: Click to enter text. E-mail: Click to enter text.

If not the same as the facility owner, there must be a long-term lease agreement in effect for at least six years. **Attachment**: Click to enter text.

h. Owner of sewage sludge disposal site (if applicable):

Mr. ☐ Ms. ☐ First/Last or Organization Name: N/A

Mailing Address: Click to enter text. City/State/ZIP Code: Click to enter text.

Phone No.: Click to enter text. Fax No.: Click to enter text. E-mail: Click to enter text.

If not the same as the facility owner, there must be a long-term lease agreement in effect for at least six years. **Attachment**: Click to enter text.

(This information is required only if authorization is sought in the permit for sludge disposal on property owned or controlled by the applicant.)

9. TDPES DISCHARGE/TLAP DISPOSAL INFORMATION (Instructions, Pages 25-28)

a. Is the facility located on or does the treated effluent cross American Indian Land?

☐ Yes ☒ No

b. Attach an **original** full size USGS Topographic Map (or an 8.5"×11" **reproduced** portion for renewal or amendment applications) with all required information. Check the box next to each item below to confirm it has been included on the map.

- ☒ One-mile radius and three-miles downstream information
- ☒ Applicant's property boundaries
- ☒ Treatment facility boundaries
- ☒ Labeled point(s) of discharge and highlighted discharge route(s)
- ☐ Effluent disposal site boundaries
- ☒ All wastewater ponds
- ☐ Sewage sludge disposal site
- ☐ New and future construction
- ☒ Attachment: A-3 USGS Map

c. Is the location of the sewage sludge disposal site in the existing permit accurate?

☐ Yes ☐ No ☒ N/A

If **no**, or a **new** application, please give an accurate description: Click to enter text.

d. Are the point(s) of discharge and the discharge route(s) in the existing permit correct?

☐ Yes ☒ No ☐ N/A

If **no**, or a **new or amendment** applications, provide an accurate description: Via Outfalls 001-006 and 008 to Harris County Flood Control District (HCFCD) ditch G103-02-03; via Outfall 009 to an unnamed ditch; via Outfall 010 to a Wallisville Road ditch; thence to Bear Lake, which is considered to be part of the San Jacinto River Tidal; thence to the San Jacinto River Tidal in Segment No. 1001 of the San Jacinto River Basin. (See Attachment T-2 Amendment Requests for description changes.)

e. City nearest the outfall(s): Channelview

f. County in which the outfalls(s) is/are located: Harris

g. Is or will the treated wastewater discharge to a city, county, or state highway right-of-way, or a flood control district drainage ditch?

☒ Yes ☐ No

If **yes**, indicate by a check mark if: ☒ Authorization granted ☐ Authorization pending

For **new and amendment** applications, provide copies of letters that show proof of contact and the approval letter upon receipt.

Attachment: A-7 HCFCD Discharge Authorization

h. For all applications involving an average daily discharge of 5 MGD or more, provide the names of all counties located within 100 statute miles downstream of the point(s) of discharge. Harris, Galveston, Chambers, Brazoria, Jefferson

i. For **TLAPs**, is the location of the effluent disposal site in the existing permit accurate?

☐ Yes ☐ No ☒ N/A

If **no**, or if this a **new or amendment** application, provide an accurate description:

j. City nearest the disposal site: N/A

k. County in which the disposal site is located: N/A

l. Disposal Site Latitude: N/A Longitude: N/A

m. For **TLAPs**, describe how effluent is/will be routed from the treatment facility to the disposal site: N/A

n. For **TLAPs**, identify the nearest watercourse to the disposal site to which rainfall runoff might flow if not contained: N/A

10. MISCELLANEOUS INFORMATION (Instructions, Page 28)

a. Did any person formerly employed by the TCEQ represent your company and get paid for service regarding this application?

☐ Yes ☒ No

If **yes**, list each person: N/A

b. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

If **yes**, provide the following:

- Acct. No.: N/A
- Amt. due: N/A

c. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

If **yes**, provide the following:

- Enforcement Order No.: N/A
- Amt. due: N/A

11. SIGNATURE PAGE (Instructions, Page 29)

Permit No: WQ0002927000

Applicant Name: Lyondell Chemical Company

Certification:

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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signatory name (typed or printed): Christopher M. Cain

Signatory title: Site Manager

Signature: _____ Date: 12/17/2020

(Use blue ink)

Subscribed and Sworn to before me by the said Christopher M. Cain

on this 17th day of December, 20 20.

My commission expires on the 8th day of October, 20 21.

Cathey Kelley

Notary Public

CATHEY KELLEY
Notary Public, State of Texas
Comm. Expires 10-08-2021
Notary ID 3531440

[SEAL]

Harris

County, Texas

If co-applicants are necessary, each entity must submit an original, separate signature page.

INDUSTRIAL ADMINISTRATIVE REPORT 1.1

The following information is required for **new** and **amendment** applications.

1. AFFECTED LANDOWNER INFORMATION (Instructions, Pages 30-32)

a. Attach a landowners map or drawing, with scale, as applicable. Check the box next to each item to confirm it has been provided.

- ☒ The applicant's property boundaries.
- ☒ The facility site boundaries within the applicant's property boundaries.
- ☐ The distance the buffer zone falls into adjacent properties and the property boundaries of the landowners located within the buffer zone.
- ☒ The property boundaries of all landowners surrounding the applicant's property. (**Note:** if the application is a major amendment for a lignite mine, the map must include the property boundaries of all landowners adjacent to the new facility (ponds).)
- ☒ The point(s) of discharge and highlighted discharge route(s) clearly shown for one mile downstream.
- ☒ The property boundaries of the landowners located on both sides of the discharge route for one full stream mile downstream of the point of discharge.
- ☒ The property boundaries of the landowners along the watercourse for a one-half mile radius from the point of discharge if the point of discharge is into a lake, bay, estuary, or affected by tides.
- ☐ The boundaries of the effluent disposal site (e.g., irrigation area or subsurface drainfield site) and all evaporation/holding ponds within the applicant's property.
- ☐ The property boundaries of all landowners surrounding the applicant's property boundaries where the effluent disposal site is located.
- ☐ The boundaries of the sludge land application site (for land application of sewage sludge for beneficial use) and the property boundaries of landowners within one-quarter mile of the applicant's property boundaries where the sewage sludge land application site is located.
- ☐ The property boundaries of landowners within one-half mile in all directions from the applicant's property boundaries where the sewage sludge disposal site (e.g., sludge surface disposal site or sludge monofill) is located.

Attachment: A-4-1 Landowner Map

b. Check the box next to the format of the landowners list:

☒ Readable/Writeable CD ☐ Four sets of labels

c. ☒ Check this box to confirm a separate list with the landowners' names and mailing addresses cross-referenced to the landowners map has been attached.

Attachment: A-4-2 Landowner List

d. Provide the source of the landowners' names and mailing addresses: Harris County Appraisal District

e. As required by *Texas Water Code § 5.115*, is any permanent school fund land affected by this application?

☐ Yes ☒ No

If **yes**, provide the location and foreseeable impacts and effects this application has on the land(s): N/A

2. ORIGINAL PHOTOGRAPHS (Instructions, Page 32)

Provide original ground level photographs. Indicate with checkmarks that the following information is provided.

☐ At least one original photograph of the new or expanded treatment unit location.

☒ At least two photographs of the existing/proposed point of discharge and as much area downstream (photo 1) and upstream (photo 2) as can be captured. If the discharge is to an open water body (e.g., lake, bay), the point of discharge should be in the right or left edge of each photograph showing the open water and with as much area on each respective side of the discharge as can be captured.

☐ At least one photograph of the existing/proposed effluent disposal site.

☒ A plot plan or map showing the location and direction of each photograph.

Attachment: A-5 Outfall Photos

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING INDUSTRIAL TPDES WASTEWATER PERMIT APPLICATIONS

TCEQ USE ONLY:

Application type: ____Renewal _____Major Amendment _____Minor Amendment _____New

County: _____ Segment Number: _____

Admin Complete Date: _____

Agency Receiving SPIF:

_____ Texas Historical Commission _____ U.S. Fish and Wildlife

_____ Texas Parks and Wildlife Department _____ U.S. Army Corps of Engineers

This form applies to TPDES permit applications only. (Instructions, Page 33)

The SPIF must be completed as a separate document. The TCEQ will mail a copy of the SPIF to each agency as required by the TCEQ agreement with EPA. If any of the items are not completely addressed or further information is needed, you will be contacted to provide the information before the permit is issued. Each item must be completely addressed.

Do not refer to a response of any item in the permit application form. Each attachment must be provided with this form separately from the administrative report of the application. The application will not be declared administratively complete without this form being completed in its entirety including all attachments.

The following applies to all applications:

1. Permittee Name: Lyondell Chemical Company

2. Permit No.: WQ0002927000 EPA ID No.: TX0069493

3. Address of the project (location description that includes street/highway, city/vicinity, and county): 2502 Sheldon Road, Channelview, Harris County, Texas 77530

4. Provide the name, address, phone and fax number, and email address of an individual that can be contacted to answer specific questions about the property.

   First/Last Name: Nancy Ross Title: Senior Environmental Engineer Credential:

   Organization Name: Lyondell Chemical Company

   Mailing Address: P.O. Box 777 City/State/ZIP Code: Channelview, TX 77530-0777

   Phone No.: 281-452-8722 Fax No.: N/A E-mail: Nancy.Ross@lyondellbasell.com

5. List the county in which the facility is located: Harris

6. If the property is publicly owned and the owner is different than the permittee/applicant, please list the owner of the property: N/A

7. Provide a description of the effluent discharge route. The discharge route must follow the flow of effluent from the point of discharge to the nearest major watercourse (from the point of discharge to a classified segment as defined in *30 TAC Chapter 307*). If known, please identify the classified segment number: Via Outfalls 001-006 and 008 to Harris County Flood Control District (HCFCD) ditch G103-02-03; via Outfall 009 to an unnamed ditch; via Outfall 010 to a Wallisville Road ditch; thence to Bear Lake, which is considered to be part of the San Jacinto River Tidal; thence to the San Jacinto River Tidal in Segment No. 1001 of the San Jacinto River Basin.

8. Please provide a separate 7.5-minute USGS quadrangle map with the project boundaries plotted and a general location map showing the project area. Please highlight the discharge route from the point of discharge for a distance of one mile downstream. (This map is required in addition to the map in the administrative report.)

   Attachment: SPIF-1 USGS Map

9. Provide original photographs of any structures 50 years or older on the property.

   Attachment: N/A

10. Does your project involve any of the following? Check all that apply.

    ☐ Proposed access roads, utility lines, construction easements

    ☐ Visual effects that could damage or detract from a historic property's integrity

    ☐ Vibration effects during construction or as a result of project design

    ☐ Additional phases of development that are planned for the future

    ☐ Sealing caves, fractures, sinkholes, other karst features

    ☐ Disturbance of vegetation or wetlands

11. List proposed construction impact (surface acres to be impacted, depth of excavation, sealing of caves, or other karst features): Construction of a Propylene Oxide (PO) / Tertiary Butyl Alcohol (TBA) plant is currently underway with startup targeted for 2022. The area of construction had been used formerly for industrial manufacturing.

12. Describe existing disturbances, vegetation, and land use: Land use is industrial. Ground cover throughout consists of stabilized road base, concrete, and grass.

THE FOLLOWING ITEMS APPLY ONLY TO APPLICATIONS FOR NEW TPDES PERMITS AND MAJOR AMENDMENTS TO TPDES PERMITS

13. List construction dates of all buildings and structures on the property: Initial construction at the site began in 1974. Additional buildings and process units were added in subsequent years.

14. Provide a brief history of the property, and name of the architect/builder, if known: The first production units began operation in 1977 as the Channelview Plant of the Oxirane Chemical Company. The plant was later acquired by Atlantic Richfield and is currently owned by Lyondell Chemical Company. The site has been used continuously as a chemical manufacturing facility since 1977.

TECHNICAL REPORT 1.0
INDUSTRIAL

The following information **is required** for all applications for a TLAP or an individual TPDES discharge permit.

For additional information or clarification on the requested information, refer to the Instructions for Completing the Industrial Wastewater Permit Application[1] available on the TCEQ website.

If more than one outfall is included in the application, provide applicable information for each individual outfall. **If an item does not apply to the facility, enter N/A** to indicate that the item has been considered. Include separate reports or additional sheets as **clearly cross-referenced attachments** and provide the attachment number in the space provided for the item the attachment addresses.

NOTE: This application is for an industrial wastewater permit only. Additional authorizations from the TCEQ Waste Permits Division or the TCEQ Air Permits Division may be needed.

1. FACILITY/SITE INFORMATION (Instructions, Pages 34-35)

a. Describe the general nature of the business and type(s) of industrial and commercial activities. Include all applicable SIC codes (up to 4).

Lyondell Channelview manufactures various organic chemicals. Applicable SIC codes are 2869 and 2865.

b. Describe all wastewater-generating processes at the facility.

See Attachment T-1 Facility Description.

c. Provide a list of raw materials, major intermediates, and final products handled at the facility.

Materials List

Raw Materials	Intermediate Products	Final Products
See Attachment T-1 Facility Description, Table 1 Raw Materials, Intermediates, and Final Products.		

Attachment: T-1 Facility Description, Table 1 Raw Materials, Intermediates, and Final Products

d. Attach a facility map (drawn to scale) with the following information:

- Production areas, maintenance areas, materials-handling areas, waste-disposal areas, and water intake structures.
- The location of each unit of the WWTP including the location of wastewater collection sumps, impoundments, outfalls, and sampling points, if significantly different from outfall locations.

Attachment: T-4-1 Plot Plan Overall Plant Facilities, T-4-2 Stormwater Outfall Map, T-4-3 General Plant Layout Wastewater Treatment Unit, T-4-4 POTBA Overall Plot Plan, T-4-5 Wastewater Treatment Plant POTBA

e. Is this a new permit application for an existing facility?

[1] https://www.tceq.texas.gov/permitting/wastewater/industrial/TPDES_industrial_wastewater_steps.html

☐ Yes ☒ No

If **yes**, provide background discussion: N/A

f. Is/will the treatment facility/disposal site be located above the 100-year frequency flood level.

☒ Yes ☐ No

List source(s) used to determine 100-year frequency flood plain: FEMA Flood Insurance Rate Map 48201C0730M

If **no**, provide the elevation of the 100-year frequency flood plain and describe what protective measures are used/proposed to prevent flooding (including tail water and rainfall run-on controls) of the treatment facility and disposal area: N/A

Attachment: N/A

g. For **new** or **major amendment** permit applications, will any construction operations result in a discharge of fill material into a water in the state?

☐ Yes ☒ No ☐ N/A (renewal only)

h. If **yes** to Item 1.g, has the applicant applied for a USACE CWA Chapter 404 Dredge and Fill permit?

☐ Yes ☐ No

If **yes**, provide the permit number: N/A

If **no**, provide an approximate date of application submittal to the USACE: N/A

2. TREATMENT SYSTEM (Instructions, Page 35)

a. List any physical, chemical, or biological treatment process(es) used/proposed to treat wastewater at this facility. Include a description of each treatment process, starting with initial treatment and finishing with the outfall/point of disposal.

See Attachment T-1 Facility Description.

b. Attach a flow schematic **with a water balance** showing all sources of water and wastewater flow into the facility, wastewater flow into and from each treatment unit, and wastewater flow to each outfall/point of disposal.

Attachment: T-1 Facility Description, Figure 1 Wastewater Flow Balance, Figure 2 Wastewater Flow Diagram

3. IMPOUNDMENTS (Instructions, Pages 35-37)

Does the facility use or plan to use any wastewater impoundments (e.g., lagoons or ponds?)

☒ Yes ☐ No

If **no**, proceed to Item 4. If **yes**, complete **Item 3.a** for **existing** impoundments and **Items 3.a - 3.e** for **new or proposed** impoundments. **NOTE:** See instructions, Pages 35-37, for additional information on the attachments required by Items 3.a – 3.e.

a. Complete the table with the following information for each existing, new, or proposed impoundment:

Use Designation: Indicate the use designation for each impoundment as Treatment (**T**), Disposal (**D**), Containment (**C**), or Evaporation (**E**).

Associated Outfall Number: Provide an outfall number if a discharge occurs or will occur.

Liner Type: Indicate the liner type as Compacted clay liner (**C**), In-situ clay liner (**I**), Synthetic/plastic/rubber liner (**S**), or Alternate liner (**A**). **NOTE:** See instructions for further detail on liner specifications. If an alternate liner (A) is selected, include an attachment that provides a description of the alternate liner and any additional technical information necessary for an evaluation.

Leak Detection System: If any leak detection systems are in place/planned, enter **Y** for yes. Otherwise, enter **N** for no.

Groundwater Monitoring Wells and Data: If groundwater monitoring wells are in place/planned, enter **Y** for yes. Otherwise, enter **N** for no. Attach any existing groundwater monitoring data.

Dimensions: Provide the dimensions, freeboard, surface area, storage capacity of the impoundments, and the maximum depth (not including freeboard). For impoundments with irregular shapes, submit surface area instead of length and width.

Compliance with 40 CFR Part 257, Subpart D: If the impoundment is required to be in compliance with 40 CFR Part 257, Subpart D, enter **Y** for yes. Otherwise, enter **N** for no.

Date of Construction: Enter the date construction of the impoundment commenced (mm/dd/yy).

Impoundment Information

Parameter	**Pond #1 Sludge Digester**	**Pond #2 Sludge Holding Basin**	**Pond #3 BDO Stormwater Pond**	
Use Designation: (T) (D) (C) or (E)	T/E	T	C	
Associated Outfall Number	N/A	N/A	001 or 003	
Liner Type (C) (I) (S) or (A)	4-inch concrete	4-inch concrete	C	
Alt. Liner Attachment Reference	N/A	N/A	N/A	
Leak Detection System, Y/N	N	N	N	
Groundwater Monitoring Wells, Y/N	N	N	N	
Groundwater Monitoring Data Attachment	N/A	N/A	N/A	
Pond Bottom Located Above The Seasonal High-Water Table, Y/N	Y	Y	Y	
Length (ft)	100	65	96	
Width (ft)	100	65	183	
Max Depth From Water Surface (ft), Not Including Freeboard	8	8	6	
Freeboard (ft)	2-3	2-3	2	
Surface Area (acres)	0.23	0.10	0.40	
Storage Capacity (gallons)	700,000	133,000	790,000	
40 CFR Part 257, Subpart D, Y/N	N	N	N	
Date of Construction	1976	1976	1989	

Impoundment Information

Parameter	**Pond #4 PO/TBA Pond 1**	**Pond #5 PO/TBA Pond 2**	**Pond #6 PO/TBA Pond 3**	
Use Designation: (T) (D) (C) or (E)	C	C	C	
Associated Outfall Number	009	009	008	

Parameter	Pond #4 PO/TBA Pond 1	Pond #5 PO/TBA Pond 2	Pond #6 PO/TBA Pond 3	
Liner Type (C) (I) (S) or (A)	(see Note 1)	(see Note 1)	(see Note 1)	
Alt. Liner Attachment Reference	N/A	N/A	N/A	
Leak Detection System, Y/N	N	N	N	
Groundwater Monitoring Wells, Y/N	N	N	N	
Groundwater Monitoring Data Attachment	N/A	N/A	N/A	
Pond Bottom Located Above The Seasonal High-Water Table, Y/N	Y	Y	Y	
Length (ft)	276	199	295	
Width (ft)	180	214	204	
Max Depth From Water Surface (ft), not including freeboard	6.25	6.25	6.0	
Freeboard (ft)	4.34	4.34	4.34	
Surface Area (acres)	0.89	0.57	1.21	
Storage Capacity (gallons)	1,594,000	947,000	1,960,000	
40 CFR Part 257, Subpart D, Y/N	N	N	N	
Date of Construction	11/15/2021 (estimated)	12/15/2021 (estimated)	7/1/2021 (estimated)	
Note 1 - The TCEQ has exempted Ponds 1, 2, and 3 from the liner requirements in Other Requirement No. 4 of the current TPDES permit. This requirement specifies that before any new pond that will receive only non-process wastewater is placed in service, that a determination be obtained from the TCEQ whether the pond must be lined. Lyondell submitted a request for liner determination on October 11, 2018 and the TCEQ approved the liner exemption by letter on February 4, 2019.				

Attachment: N/A

The following information (**Items 3.b – 3.e**) is required only for **new or proposed** impoundments.

b. For new or proposed impoundments, attach any available information on the following items. If attached, check **yes** in the appropriate box. Otherwise, check **no** or **not yet designed**.

i. Liner data

☐ Yes ☒ No ☐ Not yet designed

ii. Leak detection system or groundwater monitoring data

☐ Yes ☒ No ☐ Not yet designed

iii. Groundwater impacts

☐ Yes ☒ No ☐ Not yet designed

NOTE: Item b.iii is required if the bottom of the pond is not above the seasonal high-water table in the shallowest water-bearing zone.

Attachment: See Note 1 in impoundment table above.

For TLAP applications: Items 3.c – 3.e are **not required**, continue to Item 4.

c. Attach a USGS map or a color copy of original quality and scale which accurately locates and identifies all known water supply wells and monitor wells within ½-mile of the impoundments.

Attachment: See Note 1 in impoundment table above.

d. Attach copies of State Water Well Reports (e.g., driller's logs, completion data, etc.), and data on depths to groundwater for all known water supply wells including a description of how the depths to groundwater were obtained.

Attachment: See Note 1 in impoundment table above.

e. Attach information pertaining to the groundwater, soils, geology, pond liner, etc. used to assess the potential for migration of wastes from the impoundments or the potential for contamination of groundwater or surface water.

Attachment: See Note 1 in impoundment table above.

4. OUTFALL/DISPOSAL METHOD INFORMATION (Instructions, Pages 38-39)

Complete the following tables to describe the location and wastewater discharge or disposal operations for each outfall for discharge operations and for each point of disposal for TLAP operations.

If there are more outfalls/points of disposal at the facility than the spaces provided, copies of pages 6 and/or numbered accordingly (i.e., page 6a, 6b, etc.) may be used to provide information on the additional outfalls.

For TLAP applications: Indicate the disposal method and each individual irrigation area **I**, evaporation pond **E**, or subsurface drainage system **S** by providing the appropriate letter designation for the disposal method followed by a numerical designation for each disposal area in the space provided for **Outfall** number (e.g. **E1** for evaporation pond 1, **I2** for irrigation area No. 2, etc.).

Outfall Latitude and Longitude

Outfall Number	Latitude-decimal degrees	Longitude-decimal degrees
Latitude/longitude in this table are at the point of discharge into the receiving water. See aerial maps in Attachment A-5 Outfall Photos and Attachment T-4-1 Landowner Map for outfall locations within the facility and routing through the facility collection system to receiving waters.		
001	29.812209	-95.100180
002	29.812209	-95.100180
003	29.811602	-95.115608
004	29.816032	-95.116602
005	29.816014	-95.117400
006	29.815890	-95.125482
007	N/A. This outfall is for stormwater from a concrete batch plant (none currently active) associated with construction activities and its location would vary by construction project.	
008 (estimated start-up 2021)	29.816032	-95.116602
009 (estimated start-up 2021)	29.820842	-95.106945
010 (not constructed)	29.824167	-95.109444
	Outfall 010 has not been constructed and may not be needed, but Lyondell wishes to retain it in the permit in case the need arises.	

Outfall Location Description

Outfall Number	Location Description
001	From a discharge pipe into an unnamed ditch, which intersects HCFCD ditch G103-02-03.
002	From a weir into an unnamed ditch, which intersects HCFCD ditch G103-02-03.
003	From a stormwater detention area into HCFCD ditch G103-02-03.
004	Through a pipe into an unnamed ditch, which intersects HCFCD ditch G103-02-03.
005	Through a pipe into HCFCD ditch G103-02-03.
006	Through a pipe into HCFCD ditch G103-02-03.
007	N/A (see comment above)
008	From Pond 3 to an unnamed ditch, which intersects HCFCD ditch G103-02-03.
009	From Pond 2 to an unnamed ditch, which flows to Bear Lake.
010	At the northeast section of the PO/TBA Plant adjacent to Wallisville Road, discharging to a Wallisville Road ditch.

Description of Sampling Points (if different from Outfall location)

Outfall Number	Description of Sampling Point
001	At the point of discharge from the effluent box prior to discharge to the HCFCD ditch G103-02-03
002	At the 2.5-foot weir located in the southeast corner of the plant, prior to discharge to an unnamed ditch, which intersects HCFCD ditch G103-02-03.
003	At the mid-south side of the plant at the V-notch weir prior to discharging into two stormwater detention areas.

Outfall Number	Description of Sampling Point
004	At the mid-north portion of the plant at the V-notch weir prior to discharging into a 48-inch diameter pipe, which discharges to HCFCD ditch G103-02-03.
005	At the southwest portion of the plant at the V-notch weir prior to discharging into a 54-inch diameter pipe, which discharges to HCFCD ditch G103-02-03.
006	At the southwest portion of the plant at the V-notch weir prior to discharging into a 48-inch diameter pipe, which discharges to HCFCD ditch G103-02-03.
007	At the discharge point of stormwater runoff from the concrete batch plant located in the construction area and prior to combining with other stormwater runoff or wastewaters.
008	At the discharge from Pond 3 prior to discharging into an unnamed ditch, which discharges to HCFCD ditch G103-02-03.
009	At the discharge from Pond 2 prior to discharging into an unnamed ditch, which discharges to Bear Lake.
010	Same as outfall location.

Outfall Flow Information – Permitted and Proposed

Outfall Number	Permitted Daily Avg Flow (MGD)	Permitted Daily Max Flow (MGD)	Proposed Daily Avg Flow (MGD)	Proposed Daily Max Flow (MGD)	Anticipated Discharge Date (mm/dd/yy)
001 (Interim Phase)	3.2	7.2	3.2	7.2	N/A
001 (Final Phase)	3.8	7.2	3.8	7.2	N/A
002	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	N/A
003	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	N/A
004	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	N/A
005	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	N/A
006	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	N/A
007	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	N/A
008	Continuous and flow-variable	Continuous and flow-variable	Continuous and flow-variable	Continuous and flow-variable	N/A
009	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	N/A
010	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	N/A

Outfall Discharge – Method and Measurement

Outfall Number	Pumped Discharge? Y/N	Gravity Discharge? Y/N	Type of Flow Measurement Device Used
001	N	Y	Rectangular weir
002	N	Y	Estimate
003	N	Y	Estimate
004	N	Y	Estimate
005	N	Y	Estimate
006	N	Y	Estimate
007	N	Y	Estimate
008	N	Y	Rectangular weir
009	N	Y	Rectangular weir
010	N	Y	Estimate

Outfall Discharge – Flow Characteristics

Outfall Number	Intermittent Discharge? Y/N	Continuous Discharge? Y/N	Seasonal Discharge? Y/N	Discharge Duration (hrs/day)	Discharge Duration (days/mo)	Discharge Duration (mo/yr)
001	N	Y	N	24	31	12
002	Y	N	N	Variable	Variable	Variable
003	Y	N	N	Variable	Variable	Variable
004	Y	N	N	Variable	Variable	Variable
005	Y	N	N	Variable	Variable	Variable
006	Y	N	N	Variable	Variable	Variable
007	Y	N	N	Variable	Variable	Variable
008	N	Y	N	24	31	12
009	Y	N	N	Variable	Variable	Variable
010	Y	N	N	Variable	Variable	Variable

Wastestream Contributions

Outfall No.: <u>All outfalls</u>

Contributing Wastestreams	Volume (MGD)	% of Total Flow
See Attachment T-1 Facility Description, Table 2 Wastewater Sources by Outfall, Table 3-1 Wastewater Flows by Outfall (Interim Phase without PO/TBA), and Table 3-2 Wastewater Flows by Outfall (Final Phase with PO/TBA).		

Outfall No.: <u>N/A</u>

Outfall No.: <u>N/A</u>

Attachment: <u>N/A</u>

5. BLOWDOWN AND ONCE-THROUGH COOLING WATER DISCHARGES (Instructions, Page 39)

a. Does the facility use/propose to use any cooling towers which discharge blowdown or other wastestreams to the outfall(s)?

☒ Yes ☐ No

NOTE: If the facility uses or plans to use cooling towers, Item 12 **is required**.

b. Does the facility use or plan to use any boilers that discharge blowdown or other wastestreams to the outfall(s)?

☒ Yes ☐ No

c. Does or will the facility discharge once-through cooling water to the outfall(s)?

☐ Yes ☒ No

NOTE: If the facility uses or plans to use once-through cooling water, Item 12 **is required**.

d. If **yes** to Items 5.a, 5.b, **or** 5.c, attach the SDS with the following information for each chemical additive.

- Manufacturers Product Identification Number
- Product use (e.g., biocide, fungicide, corrosion inhibitor, etc.)
- Chemical composition including CASRN for each ingredient
- Classify product as non-persistent, persistent, or bioaccumulative
- Product or active ingredient half-life
- Frequency of product use (e.g., 2 hours/day once every two weeks)
- Product toxicity data specific to fish and aquatic invertebrate organisms
- Concentration of whole product or active ingredient, as appropriate, in wastestream.

Attach a summary of this information in addition to the submittal of the SDS for each specific wastestream and the associated chemical additives and specify which outfalls are affected.

Attachment: T-5 Treatment Chemicals and SDSs

e. Cooling Towers and Boilers

If **yes** to either Item 5.a **or** 5.b, complete the following table.

Cooling Towers and Boilers

Type of Unit	Number of Units	Dly Avg Blowdown (gallons/day)	Dly Max Blowdown (gallons/day)
Cooling Towers	3	1,740,000	2,920,000
Boilers	4	656,600	1,395,000

6. STORMWATER MANAGEMENT (Instructions, Pages 39-40)

Are there any existing/proposed outfalls which discharge stormwater associated with industrial activities, as defined at *40 CFR § 122.26(b)(14)*, commingled with any other wastestream?

☒ Yes ☐ No

If **yes**, briefly describe the industrial processes and activities that occur outdoors or in some manner which may result in exposure of the activities or materials to stormwater: See Attachment T-1 Facility Description, Stormwater Outfalls.

7. DOMESTIC SEWAGE, SEWAGE SLUDGE, AND SEPTAGE MANAGEMENT AND DISPOSAL (Instructions, Page 40)

a. Check the box next to the appropriate method of domestic sewage and domestic sewage sludge treatment or disposal. Complete Worksheet 5.0 or Item 7.b if directed to do so.

- ☒ Domestic sewage is routed (i.e., connected to or transported to) to a WWTP permitted to receive domestic sewage for treatment, disposal, or both. **Complete Item 7.b**.
- ☐ Domestic sewage is disposed of by an on-site septic tank and drainfield system. **Complete Item 7.b**.
- ☐ Domestic and industrial treatment sludge **ARE commingled** prior to use or disposal.
- ☐ Industrial wastewater and domestic sewage are treated separately, and the respective sludge **IS NOT commingled** prior to sludge use or disposal. **Complete Worksheet 5.0**.
- ☐ Facility is a POTW. **Complete Worksheet 5.0**.
- ☐ Domestic sewage is not generated on-site.
- ☒ Other (e.g., portable toilets), specify and **Complete Item 7.b**: Some domestic wastewater may be collected in on-site portable toilets during construction/maintenance work and transported off-site for treatment.

b. Provide the name and TCEQ, NPDES, or TPDES Permit No. of the waste-disposal facility which receives the domestic sewage/septage. If hauled by motorized vehicle, provide the name and TCEQ Registration No. of the hauler.

Domestic Sewage Plant/Hauler Name

Plant/Hauler Name	Permit/Registration No.
Harris County Water Control and Improvement District No. 84 Wastewater Treatment Facility	WQ0010558001
Equistar Chemicals, LP	WQ0000391000

8. IMPROVEMENTS OR COMPLIANCE/ENFORCEMENT REQUIREMENTS (Instructions, Page 40)

a. Is the permittee currently required to meet any implementation schedule for compliance or enforcement?

☐ Yes ☒ No

b. Has the permittee completed or planned for any improvements or construction projects?

☒ Yes ☐ No

c. If **yes** to either 8.a **or** 8.b, provide a brief summary of the requirements and a status update: Mechanical completion for the PO/TBA wastewater treatment unit expansion is estimated December 2021. Estimated start-up is March 2022.

9. TOXICITY TESTING (Instructions, Page 41)

Have any biological tests for acute or chronic toxicity been made on any of the discharges or on a receiving water in relation to the discharge within the last three years?

☒ Yes ☐ No

If **yes**, identify the tests and describe their purposes: Routine biomonitoring tests and reporting are required by the current TPDES permit.

Additionally, attach a copy of all tests performed which **have not** been submitted to the TCEQ or EPA.

Attachment: N/A

10. OFF-SITE/THIRD PARTY WASTES (Instructions, Page 41)

a. Does or will the facility receive wastes from off-site sources for treatment at the facility, disposal on-site via land application, or discharge via a permitted outfall?

☒ Yes ☐ No

If **no**, proceed to Item 11. If **yes**, provide responses to Items 10.b through 10.d below.

b. Attach the following information to the application:

- List of wastes received (including volumes, characterization, and capability with on-site wastes).
- Identify the sources of wastes received (including the legal name and addresses of the generators).
- Description of the relationship of waste source(s) with the facility's activities.

Attachment: T-1 Facility Description, Third-Party Wastewaters

c. Is or will wastewater from another TCEQ, NPDES, or TPDES permitted facility commingled with this facility's wastewater after final treatment and prior to discharge via the final outfall/point of disposal?

☐ Yes ☒ No

If **yes**, provide the name, address, and TCEQ, NPDES, or TPDES permit number of the contributing facility and a copy of any agreements or contracts relating to this activity.

Attachment: N/A

d. Is this facility a POTW that accepts/will accept process wastewater from any SIU and has/is required to have an approved pretreatment program under the NPDES/TPDES program?

☐ Yes ☒ No

If **yes**, **Worksheet 6.0** of this application **is required**.

11. RADIOACTIVE MATERIALS (Instructions, Pages 41-42)

a. Are/will radioactive materials be mined, used, stored, or processed at this facility?

☐ Yes ☒ No

If **yes**, use the following table to provide the results of one analysis of the effluent for all radioactive materials that may be present. Provide results in pCi/L.

Radioactive Materials Mined, Used, Stored, or Processed

Radioactive Material	Concentration (pCi/L)
N/A	

b. Does the applicant or anyone at the facility have any knowledge or reason to believe that radioactive materials may be present in the discharge, including naturally occurring radioactive materials in the source waters or on the facility property?

☐ Yes ☒ No

If **yes**, use the following table to provide the results of one analysis of the effluent for all radioactive materials that may be present. Provide results in pCi/L. Do not include information provided in response to Item 11.a.

Radioactive Materials Present in the Discharge

Radioactive Material	Concentration (pCi/L)
NORM can be present in equipment used to manage gases such as natural gas, ethylene, and propylene. Radium 226 and Radium 228 can be present in the NORM equipment. NORM accumulates on the sides of vessels (e.g., elbows, valves) as scale. If the vessel/pipe is taken out of service and tests positive for NORM, it will be removed and replaced with new material. If the equipment will be reused (e.g., a pump), it will be sent off-site for cleaning and service. No NORM is intentionally washed down to wastewater treatment.	N/A

12. COOLING WATER (Instructions, Pages 42-43)

a. Does the facility use or propose to use water for cooling purposes?

☒ Yes ☐ No

If **no**, stop here. If **yes**, complete Items 12.b thru 12.f.

b. Cooling water is/will be obtained from a groundwater source (e.g., on-site well).

☐ Yes ☒ No

If **yes**, stop here. If **no**, continue.

c. Cooling Water Supplier

i. Provide the name of the owner(s) and operator(s) for the CWIS that supplies or will supply water for cooling purposes to the facility.

Cooling Water Intake Structure(s) Owner(s) and Operator(s)

CWIS ID	Intakes on Lake Houston ((S1010013C, S1010013D, S1010013E – IDs in TCEQ's PWS database)
Owner	City of Houston
Operator	Coastal Water Authority
For more information, see Attachment T-1 Facility Description, Water Supply.	

ii. Cooling water is/will be obtained from a Public Water Supplier (PWS)

☒ Yes ☐ No

If **no**, continue. If **yes**, provide the PWS Registration No. and stop here: TX1010013

iii. Cooling water is/will be obtained from an Independent Supplier

☐ Yes ☐ No

If **no**, proceed to Item 12.d. If **yes,** contact the Industrial Permits Team to determine what application materials are required. Attach copies of the correspondence with the TCEQ and any required application materials, as stipulated in the correspondence with the TCEQ.

Attachment: Click to enter text.

d. 316(b) General Criteria

i. The CWIS(s) have or will have a cumulative design intake flow of 2 MGD or greater

☐ Yes ☐ No

ii. At least 25% of the total water withdrawn by the CWIS is/will be used exclusively for cooling purposes on an annual average basis

☐ Yes ☐ No

iii. The facility withdraws/proposes to withdraw water for cooling purposes from surface waters that meet the definition of Waters of the United States in *40 CFR § 122.2*.

☐ Yes ☐ No

If **no**, provide an explanation of how the waterbody does not meet the definition of Waters of the United States in *40 CFR § 122.2*: Click to enter text.

If **yes** to all three questions in Item 12.d, the facility is subject to 316(b). Proceed to Item 12.f.

If **no** to any of the questions in Item 12.d, the facility does not meet the minimum criteria to be subject to the full requirements of 316(b). Proceed to Item 12.e.

e. The facility is **not subject** to 316(b) **and uses/proposes to use cooling towers**.

☐ Yes ☐ No

If **yes**, stop here. If **no**, complete Worksheet 11.0, Items 1(a), 1(b)(i-iii) and (vi), 2(b)(i), and 3(a) to allow for a determination based upon BPJ.

f. Phase I vs Phase II Facilities

i. Existing facility (Phase II)

☐ Yes ☐ No

If **yes**, complete Worksheets 11.0 through 11.3, as applicable. Otherwise, continue.

ii. New Facility – (Phase I)

☐ Yes ☐ No

If **yes**, check the box next to the facility's compliance track selection, attach the requested information, and complete Worksheet 11.0, Items 2 and 3, and Worksheet 11.2:

☐ Track I - AIF greater than 2 MGD, but less than 10 MGD
- Attach information required by *40 CFR §§ 125.86(b)(2)-(4)*.

☐ Track I - AIF greater than 10 MGD
- Attach information required by *40 CFR § 125.86(b)*.

☐ Track II
- Attach information required by *40 CFR § 125.86(c)*.

Attachment: Click to enter text.

NOTE: Item 13 is required only for existing permitted facilities.

13. PERMIT CHANGE REQUESTS (Instructions, Pages 43-44)

a. Is the facility requesting a **major amendment** of an existing permit?

☒ Yes ☐ No

If **yes**, list each request individually and provide the following information: 1) detailed information regarding the scope of each request and 2) a justification for each request. Attach any supplemental information or additional data to support each request.

1. Use a site-specific hardness for calculation of water quality-based effluent limits.
2. Increase the daily average, daily maximum, and single grab limits for copper for Outfall 001.
3. Remove limits and monitoring for aluminum, zinc, and total xylenes for Outfall 001.
4. Add wastewaters to Outfall 001 - cooling tower and boiler maintenance wastewaters, water treatment wastewaters, construction stormwater, water from landfarm, and utility wastewaters.
5. Modify descriptions of certain wastewaters already authorized for Outfall 001 – cooling tower and boiler blowdown, heat exchanger blasting slab waste, demineralizer regeneration blowdown, and stormwater.
6. Add water from landfarm to Outfall 002.
7. Increase the daily maximum pH limit for Outfall 002 from 9.0 standard units (SU) to 9.5 SU.
8. Reduce monitoring frequency for Outfalls 002 and 003 for TOC and oil and grease from weekly to once per two weeks.
9. Use site-specific partitioning coefficients for aluminum for Outfalls 003, 004, and 005 for calculating water quality-based effluent limits.
10. Add wastewaters to Outfall 008 – boiler blowdown, cooling tower and boiler maintenance wastewaters.
11. Update the discharge and monitoring locations for Outfalls 008, 009, and 010.
12. Revise the discharge routing description for Outfall 009.
13. Remove Other Requirements Nos. 5, 12, and 14, which have been completed.
14. Update Other Requirement No. 4 related to pond requirements to the newer version now being used by the TCEQ.
For additional information, see Attachment T-2 Amendment Requests.

b. Is the facility requesting any **minor amendments** to the permit?

☐ Yes ☒ No

If **yes**, list and discuss the requested changes.

N/A

c. Is the facility requesting any **minor modifications** to the permit?

☒ Yes ☐ No

If **yes**, list and discuss the requested changes.

Correct the discharge routing description for Outfall 010 on the permit cover sheet from "via Outfall 010 to Wallisville roadside ditch" to "via Outfall 010 to a Wallisville Road ditch."

WORKSHEET 1.0
EPA CATEGORICAL EFFLUENT GUIDELINES

This worksheet **is required** for all applications for TPDES permits for discharges of wastewaters subject to EPA categorical effluent limitation guidelines (ELGs).

1. CATEGORICAL INDUSTRIES (Instructions, Pages 47-48)

Is this facility subject to any of the 40 CFR categorical ELGs outlined on page 52 of the instructions?

☒ Yes ☐ No

If **no**, this worksheet is not required. If **yes**, provide the appropriate information in the table below.

40 CFR Effluent Guidelines

Industry	40 CFR Part
Organic Chemicals, Plastics, and Synthetic Fibers	414

2. PRODUCTION/PROCESS DATA (Instructions, Page 48)

a. **Production Data**

Provide the appropriate data for effluent guidelines with production-based effluent limitations.

Production Data

Subcategory	Actual Quantity/Day	Design Quantity/Day	Units
N/A			

b. **Organic Chemicals, Plastics, and Synthetic Fibers Manufacturing Data (40 CFR Part 414)**

Provide each applicable subpart and the percent of total production. Provide data for metal-bearing and cyanide-bearing wastestreams, as required by *40 CFR Part 414, Appendices A and B*.

Percentages of Total Production

Subcategory	Percent of Total Production	Appendix A and B - Metal	Appendix A – Cyanide
Subpart F Commodity Organic Chemicals	30%*/31%**	Chromium (0.131 MGD) – Styrene/dehydrogenation of ethylbenzene Copper (0.131 MGD) – 1,4-Butanediol/hydrogenation of 1,4-butynediol	N/A
Subpart G Bulk Organic Chemicals	22%*/36%**	N/A	N/A
Subpart H Specialty Organic Chemicals	48%*/33%**	Copper (no associated wastewater generated)	N/A
Subpart I End-of-Pipe Biological Treatment	N/A	N/A	N/A
*Current production units **With addition of PO/TBA unit			

c. **Refineries (40 CFR Part 419)**

Provide the applicable subcategory and a brief justification.

N/A

3. PROCESS/NON-PROCESS WASTEWATER FLOWS (Instructions, Page 48)

Provide a breakdown of wastewater flow(s) generated by the facility, including both process and non-process wastewater flow(s). Specify which wastewater flows are to be authorized for discharge under this permit and the disposal practices for wastewater flows, excluding domestic, which are not to be authorized for discharge under this permit.

See Attachment T-1 Facility Description, Table 3-1 Wastewater Flows by Outfall (Interim Phase without PO/TBA) and Table 3-2 Wastewater Flows by Outfall (Final Phase with PO/TBA).

4. NEW SOURCE DETERMINATION (Instructions, Page 48)

Provide a list of all wastewater-generating processes subject to EPA categorical ELGs, identify the appropriate guideline Part and Subpart, and provide the date the process/construction commenced.

Wastewater-generating Processes Subject to Effluent Guidelines

Process	EPA Guideline: Part	EPA Guideline: Subpart	Date Process/ Construction Commenced
Propylene Oxide	414	F	1977
Styrene Monomer	414	F	1977
1,4-Butanediol	414	G	1989
Isobutylene	414	G	2006
Methyl Tertiary Butyl Ether	414	G	1986
Tert-Butyl Alcohol	414	G	2017
Allyl Alcohol	414	H	1989
Butyrolactone	414	H	1989
Ethyl Tertiary Butyl Ether	414	H	2008
2-Methyl-1,3-Propanediol	414	H	1989
N-Methyl Pyrrolidone	414	H	1989
Polyols	414	H	1988
Tetrahydrofuran	414	H	1989

WORKSHEET 2.0
POLLUTANT ANALYSES REQUIREMENTS

Worksheet 2.0 **is required** for all applications submitted for a TPDES permit. Worksheet 2.0 is not required for applications for a permit to dispose of all wastewater by land disposal or for discharges solely of stormwater associated with industrial activities.

i. LABORATORY ACCREDITATION (Instructions, Page 49)

Effective July 1, 2008, all laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification* with the following general exemptions:

a. The laboratory is an in-house laboratory and is:
   - periodically inspected by the TCEQ; or

1. located in another state and is accredited or inspected by that state; or
   i. performing work for another company with a unit located in the same site; or
   ii. performing pro bono work for a governmental agency or charitable organization.
1. The laboratory is accredited under federal law.
2. The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
3. The laboratory supplies data for which the TCEQ does not offer accreditation.

Review *30 TAC Chapter 25* for specific requirements. The following certification statement shall be signed and submitted with every application. See Instructions, Page 32, for a list of approved signatories.

I, Christopher M. Cain, Site Manager, certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification.*

12/17/2020

(Signature and date)

Note: Any exceptions are noted in the worksheet tables.

1. GENERAL TESTING REQUIREMENTS (Instructions, Pages 49-51)

1. Provide the date range of all sampling events conducted to obtain the analytical data submitted with this application (e.g., 05/01/2018-05/30/2018): 09/03/2020 – 11/03/2020

2. ☒ Check the box to confirm all samples were collected no more than 12 months prior to the date of application submittal.

3. Read the general testing requirements in the instructions for important information about sampling, test methods, and MALs. If a contact laboratory was used, attach a list which includes the name, contact information, and pollutants analyzed for each laboratory/firm. **Attachment:** T-3 Laboratories for Outfall Analyses

4. SPECIFIC TESTING REQUIREMENTS (Instructions, Pages 51-62)

Attach correspondence from TCEQ approving submittal of less than the required number of samples, if applicable. **Attachment:** N/A

TABLE 1 and TABLE 2 (Instructions, Page 50)

Completion of Tables 1 and 2 **is required** for **all external outfalls** for all TPDES permit applications.

Table 1 for Outfall No.: 001

Samples are (check one): ☒ **Composite** ☒ **Grab**

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
BOD (5-day)	<2	9	3	2
CBOD (5-day)	<2	2	2	<2
Chemical oxygen demand	70	71	70	59
Total organic carbon	14	13	13	12
Dissolved oxygen	6.13	5.93	6.04	5.94
Ammonia nitrogen	<0.25	<0.25	<0.25	<0.25
Total suspended solids	7.8	12.5	5.2	9.6
Nitrate nitrogen	-	7.9	4.33	4.49
Total organic nitrogen	4.22	4.87	3.59	3.30
Total phosphorus	1.86	2.05	2.12	2.13
Oil and grease	5	<5	<5	<5
Total residual chlorine	0.72	0.63	0.69	0.29
Total dissolved solids	2650	3080	2490	2120
Sulfate	1280	1720	1160	1040
Chloride	252	249	243	214
Fluoride	1.01	0.73	0.51	0.65
Total alkalinity (mg/L as $CaCO_3$)	356	380	372	394
Temperature (°F)	82.7	81.5	86.0	87.8
pH (standard units)	7.5	7.8	7.4	7.2

Table 2 for Outfall No.: 001

Samples are (check one): ☒ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Aluminum, total	71.8	88.3	84.9	68.4	2.5
Antimony, total	4.6	4.3	4.4	4.4	5
Arsenic, total	15.1	13.2	12.6	10.5	0.5
Barium, total	223	209	216	200	3
Beryllium, total	<0.4	<0.4	<0.4	<0.4	0.5
Cadmium, total	<0.4	<0.4	<0.4	<0.4	1
Chromium, total	1.9	2	2	1.8	3
Chromium, hexavalent	<3.4	<3.4	<3.4	<3.4	3
Chromium, trivalent	1.9	2	2	1.8	N/A

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Copper, total	22.5	15.4	12.2	10.5	2
Cyanide, available	8.28 [CN-avail] <0.785 [CN-free]	4.47 [CN-avail] <0.785 [CN-free]	6.54 [CN-avail] <0.785 [CN-free]	2.33 [CN-avail] <0.785 [CN-free]	2/10
Lead, total	0.6	0.6	<0.4	<0.4	0.5
Mercury, total	0.02715	0.0201	0.036	0.249	0.005/0.0005
Nickel, total	5.7	5.7	4.7	5	2
Selenium, total	<3.2	<3.2	<3.2	<3.2	5
Silver, total	<0.4	<0.4	<0.4	<0.4	0.5
Thallium, total	<0.4	<0.4	<0.4	<0.4	0.5
Zinc, total	9	32.2	10.8	12	5.0

TABLE 3 (Instructions, Page 50)

Completion of Table 3 **is required** for all **external outfalls** which discharge process wastewater.

Partial completion of Table 3 **is required** for all **external outfalls** which discharge non-process wastewater and stormwater associated with industrial activities commingled with other wastestreams (see instructions for additional guidance).

Table 3 for Outfall No.: 001

Samples are (check one): ☒ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Acrylonitrile	<3	<3	<3	<3	50
Anthracene	<0.35	<0.4	<0.36	<0.35	10
Benzene	<1	<1	<1	<1	10
Benzidine	<0.66	<0.76	<0.69	<0.66	50
Benzo(a)anthracene	<0.38	<0.44	<0.4	<0.38	5
Benzo(a)pyrene	<0.85	<0.98	<0.88	<0.85	5
Bis(2-chloroethyl)ether	<0.72	<0.83	<0.75	<0.72	10
Bis(2-ethylhexyl)phthalate	<2.2	<2.53	<2.29	<2.2	10
Bromodichloromethane [Dichlorobromomethane]	<1	<1	<1	<1	10
Bromoform	<1	<1	<1	<1	10
Carbon tetrachloride	<1	<1	<1	<1	2
Chlorobenzene	<1	<1	<1	<1	10
Chlorodibromomethane [Dibromochloromethane]	<1	<1	<1	<1	10
Chloroform	9.56	8.92	9.69	8.7	10
Chrysene	<0.57	<0.66	<0.59	<0.57	5
m-Cresol [3-Methylphenol]	<1.32†	<4.6†	<4.16†	<4†	10
o-Cresol [2-Methylphenol]	<2	<2.3	<2.08	<2	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
p-Cresol [4-Methylphenol]	<1.32†	<4.6†	<4.16†	<4†	10
1,2-Dibromoethane	<1	<1	<1	<1	10
m-Dichlorobenzene [1,3-Dichlorobenzene]	<0.53	<0.61	<0.55	<0.53	10
o-Dichlorobenzene [1,2-Dichlorobenzene]	<0.41	<0.47	<0.43	<0.41	10
p-Dichlorobenzene [1,4-Dichlorobenzene]	<0.25	<0.29	<0.26	<0.25	10
3,3'-Dichlorobenzidine	<0.88	<1.01	<0.92	<0.88	5
1,2-Dichloroethane	<1	<1	<1	<1	10
1,1-Dichloroethene [1,1-Dichloroethylene]	<1	<1	<1	<1	10
Dichloromethane [Methylene chloride]	<1	<1	<1	<1	20
1,2-Dichloropropane	<1	<1	<1	<1	10
1,3-Dichloropropene [1,3-Dichloropropylene]	<1	<1	<1	<1	10
2,4-Dimethylphenol	<0.53	<0.61	<0.55	<0.53	10
Di-n-Butyl phthalate	<1.22	<1.4	<1.27	<1.22	10
Ethylbenzene	<1	<1	<1	<1	10
Fluoride	1010	730	510	650	500
Hexachlorobenzene	<0.69	<0.79	<0.72	<0.69	5
Hexachlorobutadiene	<0.41	<0.47	<0.43	<0.41	10
Hexachlorocyclopentadiene	<1.38	<1.59	<1.44	<1.38	10
Hexachloroethane	<0.47	<0.54	<0.49	<0.47	20
Methyl ethyl ketone	<1	<1	<1	<1	50
Nitrobenzene	<0.91	<1.05	<0.95	<0.91	10
N-Nitrosodiethylamine	<5	<5.75	<5.2	<5	20
N-Nitroso-di-n-butylamine	<5	<5.75	<5.2	<5	20
Nonylphenol	<11.8	<1.25	<1.16	<1.15	333
Pentachlorobenzene	<3	<3.45	<3.12	<3	20
Pentachlorophenol	<0.5	<0.58	<0.52	<0.5	5
Phenanthrene	<0.44	<0.51	<0.46	<0.44	10
Polychlorinated biphenyls (PCBs) (**)	<0.0146	<0.0146	<0.0146	<0.0146	0.2
Pyridine	<0.35	<0.4	<0.36	<0.35	20
1,2,4,5-Tetrachlorobenzene	<5	<5.75	<5.2	<5	20
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	10
Tetrachloroethene [Tetrachloroethylene]	<1	<1	<1	<1	10
Toluene	<1	<1	<1	<1	10
1,1,1-Trichloroethane	<1	<1	<1	<1	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
1,1,2-Trichloroethane	<1	<1	<1	<1	10
Trichloroethene [Trichloroethylene]	<1	<1	<1	<1	10
2,4,5-Trichlorophenol	<0.85	<0.98	<0.88	<0.85	50
TTHM (Total trihalomethanes)	9.56	8.92	9.69	8.7	10
Vinyl chloride	<1	<1	<1	<1	10

(*) Indicate units if different from µg/L.

(**) Total of detects for PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016. If all non-detects, enter the highest non-detect preceded by a "<".

†Semivolatiles were analyzed by EPA Method 625.1. TCEQ does not offer accreditation for m-cresol by 625.1. Laboratory reported m+p-cresol as co-eluted. Laboratory's accreditation certificate does not include p-cresol by 625.1.

TABLE 4 (Instructions, Pages 50-51)

Partial completion of Table 4 **is required** for each **external outfall** based on the conditions below.

a. Tributyltin

Is this facility an industrial/commercial facility which currently or proposes to directly dispose of wastewater from the types of operations listed below or a domestic facility which currently or proposes to receive wastewater from the types of industrial/commercial operations listed below?

☐ Yes ☒ No

If **yes**, check the box next to each of the following criteria which apply and provide the appropriate testing results in Table 4 below (check all that apply).

☐ Manufacturers and formulators of tributyltin or related compounds.

☐ Painting of ships, boats and marine structures.

☐ Ship and boat building and repairing.

☐ Ship and boat cleaning, salvage, wrecking and scaling.

☐ Operation and maintenance of marine cargo handling facilities and marinas.

☐ Facilities engaged in wood preserving.

☐ Any other industrial/commercial facility for which tributyltin is known to be present, or for which there is any reason to believe that tributyltin may be present in the effluent.

b. Enterococci (discharge to saltwater)

iii. This facility discharges/proposes to discharge directly into saltwater receiving waters **and** Enterococci bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

1. Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

c. E. coli (discharge to freshwater)

ii. This facility discharges/proposes to discharge directly into freshwater receiving waters **and** *E. coli* bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

1. Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

Table 4 for Outfall No.: N/A

Samples are (check one): ☐ **Composites** ☐ **Grabs**

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Tributyltin (µg/L)					0.010

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Enterococci (cfu or MPN/100 mL)					N/A
E. coli (cfu or MPN/100 mL)					N/A

TABLE 5 (Instructions, Page 51)

Completion of Table 5 **is required** for all **external outfalls** which discharge process wastewater from a facility which manufactures or formulates pesticides or herbicides or other wastewaters which may contain pesticides or herbicides.

If this facility does not/will not manufacture or formulate pesticides or herbicides and does not/will not discharge other wastewaters which may contain pesticides or herbicides, check N/A.

☒ N/A

Table 5 for Outfall No.: N/A
Samples are (check one): ☐ **Composites** ☐ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Aldrin					0.01
Carbaryl					5
Chlordane					0.2
Chlorpyrifos					0.05
4,4'-DDD					0.1
4,4'-DDE					0.1
4,4'-DDT					0.02
2,4-D					0.7
Danitol [Fenpropathrin]					—
Demeton					0.20
Diazinon					0.5/0.1
Dicofol [Kelthane]					1
Dieldrin					0.02
Diuron					0.090
Endosulfan I (*alpha*)					0.01
Endosulfan II (*beta*)					0.02
Endosulfan sulfate					0.1
Endrin					0.02
Guthion [Azinphos methyl]					0.1
Heptachlor					0.01
Heptachlor epoxide					0.01
Hexachlorocyclohexane (*alpha*)					0.05
Hexachlorocyclohexane (*beta*)					0.05
Hexachlorocyclohexane (*gamma*) [Lindane]					0.05
Hexachlorophene					10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Malathion					0.1
Methoxychlor					2.0
Mirex					0.02
Parathion (ethyl)					0.1
Toxaphene					0.3
2,4,5-TP [Silvex]					0.3

* Indicate units if different from µg/L.

TABLE 6 (Instructions, Page 52)

Completion of Table 6 **is required** for all **external outfalls**.

Table 6 for Outfall No.: 001
Samples are (check one): ☒ **Composites** ☒ **Grabs**

Pollutants	Believed Present	Believed Absent	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)	MAL (µg/L)*
Bromide	☐	☒	<0.5	-	-	-	400
Color (PCU)	☒	☐	5	-	-	-	—
Nitrate-Nitrite (as N)	☒	☐	6.01	-	-	-	—
Sulfide (as S)	☐	☒	<0.05	-	-	-	—
Sulfite (as SO_3)	☒	☐	1	1	2	1	—
Surfactants	☒	☐	0.0829	-	-	-	—
Boron, total	☒	☐	0.365	-	-	-	20
Cobalt, total	☒	☐	0.0008	-	-	-	0.3
Iron, total	☒	☐	0.314	-	-	-	7
Magnesium, total	☒	☐	10.3	-	-	-	20
Manganese, total	☒	☐	0.0163	-	-	-	0.5
Molybdenum, total	☒	☐	0.0688	-	-	-	1
Tin, total	☐	☒	<0.004	-	-	-	5
Titanium, total	☐	☒	<0.0044	-	-	-	30

* Indicate units if different from µg/L.

TABLE 7 (Instructions, Page 52)

Check the box next to any of the industrial categories applicable to this facility. If no categories are applicable, check N/A. If GC/MS testing is required, check the box provided to confirm the testing results for the appropriate parameters are provided with the application.

☐ N/A

Table 7 for Applicable Industrial Categories

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
☐ Adhesives and Sealants		☐ Yes	☐ Yes	☐ Yes	No
☐ Aluminum Forming	467	☐ Yes	☐ Yes	☐ Yes	No
☐ Auto and Other Laundries		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Battery Manufacturing	461	☐ Yes	No	☐ Yes	No
☐ Coal Mining	434	No	No	No	No
☐ Coil Coating	465	☐ Yes	☐ Yes	☐ Yes	No
☐ Copper Forming	468	☐ Yes	☐ Yes	☐ Yes	No
☐ Electric and Electronic Components	469	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Electroplating	413	☐ Yes	☐ Yes	☐ Yes	No
☐ Explosives Manufacturing	457	No	☐ Yes	☐ Yes	No
☐ Foundries		☐ Yes	☐ Yes	☐ Yes	No
☐ Gum and Wood Chemicals - Subparts A,B,C,E	454	☐ Yes	☐ Yes	No	No
☐ Gum and Wood Chemicals - Subparts D,F	454	☐ Yes	☐ Yes	☐ Yes	No
☐ Inorganic Chemicals Manufacturing	415	☐ Yes	☐ Yes	☐ Yes	No
☐ Iron and Steel Manufacturing	420	☐ Yes	☐ Yes	☐ Yes	No
☐ Leather Tanning and Finishing	425	☐ Yes	☐ Yes	☐ Yes	No
☐ Mechanical Products Manufacturing		☐ Yes	☐ Yes	☐ Yes	No
☐ Nonferrous Metals Manufacturing	421,471	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Ore Mining - Subpart B	440	No	☐ Yes	No	No
☒ Organic Chemicals Manufacturing	414	☒ Yes	☒ Yes	☒ Yes	☒ Yes
☐ Paint and Ink Formulation	446,447	☐ Yes	☐ Yes	☐ Yes	No
☐ Pesticides	455	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Petroleum Refining	419	☐ Yes	No	No	No
☐ Pharmaceutical Preparations	439	☐ Yes	☐ Yes	☐ Yes	No
☐ Photographic Equipment and Supplies	459	☐ Yes	☐ Yes	☐ Yes	No
☐ Plastic and Synthetic Materials Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Plastic Processing	463	☐ Yes	No	No	No
☐ Porcelain Enameling	466	No	No	No	No
☐ Printing and Publishing		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Pulp and Paperboard Mills - Subpart C	430	☐ *	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subparts F, K	430	☐ *	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts A, B, D, G, H	430	☐ Yes	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts I, J, L	430	☐ Yes	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subpart E	430	☐ Yes	☐ Yes	☐ Yes	☐ *
☐ Rubber Processing	428	☐ Yes	☐ Yes	☐ Yes	No
☐ Soap and Detergent Manufacturing	417	☐ Yes	☐ Yes	☐ Yes	No
☐ Steam Electric Power Plants	423	☐ Yes	☐ Yes	No	No

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
☐ Textile Mills (Not Subpart C)	410	☐ Yes	☐ Yes	☐ Yes	No
☐ Timber Products Processing	429	☐ Yes	☐ Yes	☐ Yes	☐ Yes

* Test if believed present.

TABLES 8, 9, 10, and 11 (Instructions, Page 52)

Completion of Tables 8, 9, 10, and 11 **is required** as specified in Table 7 for all **external outfalls** that contain process wastewater.

Completion of Tables 8, 9, 10, and 11 **may be required** for types of industry not specified in Table 7 for specific parameters that are believed to be present in the wastewater.

Table 8 for Outfall No.: 001 : Volatile Compounds
Samples are (check one): ☒ Composites ☐ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acrolein	<6	<6	<6	<6	50
Acrylonitrile	<3	<3	<3	<3	50
Benzene	<1	<1	<1	<1	10
Bromoform	<1	<1	<1	<1	10
Carbon tetrachloride	<1	<1	<1	<1	2
Chlorobenzene	<1	<1	<1	<1	10
Chlorodibromomethane	<1	<1	<1	<1	10
Chloroethane	<1	<1	<1	<1	50
2-Chloroethylvinyl ether	<6	<6	<6	<6	10
Chloroform	9.56	8.92	9.69	8.7	10
Dichlorobromomethane [Bromodichloromethane]	<1	<1	<1	<1	10
1,1-Dichloroethane	<1	<1	<1	<1	10
1,2-Dichloroethane	<1	<1	<1	<1	10
1,1-Dichloroethylene [1,1-Dichloroethene]	<1	<1	<1	<1	10
1,2-Dichloropropane	<1	<1	<1	<1	10
1,3-Dichloropropylene [1,3-Dichloropropene]	<1	<1	<1	<1	10
Ethylbenzene	<1	<1	<1	<1	10
Methyl bromide [Bromomethane]	<2	<2	<2	<2	50
Methyl chloride [Chloromethane]	<1	<1	<1	<1	50
Methylene chloride [Dichloromethane]	<1	<1	<1	<1	20
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	10
Tetrachloroethylene [Tetrachloroethene]	<1	<1	<1	<1	10
Toluene	<1	<1	<1	<1	10
1,2-Trans-dichloroethylene [1,2-Trans-dichloroethene]	<1	<1	<1	<1	10
1,1,1-Trichloroethane	<1	<1	<1	<1	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
1,1,2-Trichloroethane	<1	<1	<1	<1	10
Trichloroethylene [Trichloroethene]	<1	<1	<1	<1	10
Vinyl chloride	<1	<1	<1	<1	10

* Indicate units if different from µg/L.

Table 9 for Outfall No.: 001 : Acid Compounds
Samples are (check one): ☒ Composites ☐ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
2-Chlorophenol	<0.5	<0.58	<0.52	<0.5	10
2,4-Dichlorophenol	<0.69	<0.79	<0.72	<0.69	10
2,4-Dimethylphenol	<0.53	<0.61	<0.55	<0.53	10
4,6-Dinitro-o-cresol	<0.66	<0.76	<0.69	<0.66	50
2,4-Dinitrophenol	<1.41	<1.62	<1.47	<1.41	50
2-Nitrophenol	<0.88	<1.01	<0.92	<0.88	20
4-Nitrophenol	<1.13	<1.3	<1.18	<1.13	50
p-Chloro-m-cresol	<0.53	<0.61	<0.55	<0.53	10
Pentachlorophenol	<0.5	<0.58	<0.52	<0.5	5
Phenol	<0.44	<0.51	<0.46	<0.44	10
2,4,6-Trichlorophenol	<0.79	<0.91	<0.82	<0.79	10

* Indicate units if different from µg/L.

Table 10 for Outfall No.: 001 : Base/Neutral Compounds
Samples are (check one): ☒ Composites ☐ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acenaphthene	<0.28	<0.32	<0.29	<0.28	10
Acenaphthylene	<0.47	<0.54	<0.49	<0.47	10
Anthracene	<0.35	<0.4	<0.36	<0.35	10
Benzidine	<0.66	<0.76	<0.69	<0.66	50
Benzo(a)anthracene	<0.38	<0.44	<0.4	<0.38	5
Benzo(a)pyrene	<0.85	<0.98	<0.88	<0.85	5
3,4-Benzofluoranthene [Benzo(b)fluoranthene]	<0.57	<0.66	<0.59	<0.57	10
Benzo(ghi)perylene	<0.63	<0.72	<0.66	<0.63	20
Benzo(k)fluoranthene	<0.57	<0.66	<0.59	<0.57	5
Bis(2-chloroethoxy)methane	<0.35	<0.4	<0.36	<0.35	10
Bis(2-chloroethyl)ether	<0.72	<0.83	<0.75	<0.72	10
Bis(2-chloroisopropyl)ether	<0.85	<0.98	<0.88	<0.85	10
Bis(2-ethylhexyl)phthalate	<2.2	<2.53	<2.29	<2.2	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
4-Bromophenyl phenyl ether	<0.41	<0.47	<0.43	<0.41	10
Butylbenzyl phthalate	<0.69	<0.79	<0.72	<0.69	10
2-Chloronaphthalene	<0.28	<0.32	<0.29	<0.28	10
4-Chlorophenyl phenyl ether	<0.66	<0.76	<0.69	<0.66	10
Chrysene	<0.57	<0.66	<0.59	<0.57	5
Dibenzo(a,h)anthracene	<0.69	<0.79	<0.72	<0.69	5
1,2-Dichlorobenzene [o-Dichlorobenzene]	<0.41	<0.47	<0.43	<0.41	10
1,3-Dichlorobenzene [m-Dichlorobenzene]	<0.53	<0.61	<0.55	<0.53	10
1,4-Dichlorobenzene [p-Dichlorobenzene]	<0.25	<0.29	<0.26	<0.25	10
3,3'-Dichlorobenzidine	<0.88	<1.01	<0.92	<0.88	5
Diethyl phthalate	<0.63	<0.72	<0.66	<0.63	10
Dimethyl phthalate	<0.72	<0.83	<0.75	<0.72	10
Di-n-butyl phthalate	<1.22	<1.4	<1.27	<1.22	10
2,4-Dinitrotoluene	<0.97	<1.12	<1.01	<0.97	10
2,6-Dinitrotoluene	<1.22	<1.4	<1.27	<1.22	10
Di-n-octyl phthalate	<2.76	<3.17	<2.87	<2.76	10
1,2-Diphenylhydrazine (as Azobenzene)	<0.22	<0.25	<0.23	<0.22	20
Fluoranthene	<0.44	<0.51	<0.46	<0.44	10
Fluorene	<0.47	<0.54	<0.49	<0.47	10
Hexachlorobenzene	<0.69	<0.79	<0.72	<0.69	5
Hexachlorobutadiene	<0.41	<0.47	<0.43	<0.41	10
Hexachlorocyclopentadiene	<1.38	<1.59	<1.44	<1.38	10
Hexachloroethane	<0.47	<0.54	<0.49	<0.47	20
Indeno(1,2,3-cd)pyrene	<0.22	<0.25	<0.23	<0.22	5
Isophorone	<0.28	<0.32	<0.29	<0.28	10
Naphthalene	<0.31	<0.36	<0.32	<0.31	10
Nitrobenzene	<0.91	<1.05	<0.95	<0.91	10
N-Nitrosodimethylamine	<0.79	<0.91	<0.82	<0.79	50
N-Nitrosodi-n-propylamine	<0.72	<0.83	<0.75	<0.72	20
N-Nitrosodiphenylamine	<0.47	<0.54	<0.49	<0.47	20
Phenanthrene	<0.44	<0.51	<0.46	<0.44	10
Pyrene	<0.57	<0.66	<0.59	<0.57	10
1,2,4-Trichlorobenzene	<0.53	<0.61	<0.55	<0.53	10

* Indicate units if different from µg/L.

Table 11 for Outfall No.: 001 : Pesticides
Samples are (check one): ☒ **Composites** ☐ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Aldrin	-	<0.003	<0.003	-	0.01
alpha-BHC [alpha-Hexachlorocyclohexane]	-	<0.008	<0.008	-	0.05
beta-BHC [beta-Hexachlorocyclohexane]	-	<0.01	<0.01	-	0.05
gamma-BHC [gamma-Hexachlorocyclohexane]	-	<0.005	<0.005	-	0.05
delta-BHC [delta-Hexachlorocyclohexane]	-	<0.004	<0.004	-	0.05
Chlordane	-	<0.1	<0.1	-	0.2
4,4'-DDT	-	<0.004	<0.004	-	0.02
4,4'-DDE	-	<0.002	<0.002	-	0.1
4,4'-DDD	-	<0.006	<0.006	-	0.1
Dieldrin	-	<0.003	<0.003	-	0.02
Endosulfan I (alpha)	-	<0.003	<0.003	-	0.01
Endosulfan II (beta)	-	<0.004	<0.004	-	0.02
Endosulfan sulfate	-	<0.003	<0.003	-	0.1
Endrin	-	<0.004	<0.004	-	0.02
Endrin aldehyde	-	<0.008	<0.008	-	0.1
Heptachlor	-	<0.005	<0.005	-	0.01
Heptachlor epoxide	<0.0129	<0.0129	<0.0129	<0.0129	0.01
PCB 1242	<0.0129	<0.0129	<0.0129	<0.0129	0.2
PCB 1254	<0.0129	<0.0129	<0.0129	<0.0129	0.2
PCB 1221	<0.0129	<0.0129	<0.0129	<0.0129	0.2
PCB 1232	<0.0129	<0.0129	<0.0129	<0.0129	0.2
PCB 1248	<0.0129	<0.0129	<0.0129	<0.0129	0.2
PCB 1260	<0.01005	<0.01005	<0.01005	<0.01005	0.2
PCB 1016	<0.0146	<0.0146	<0.0146	<0.0146	0.2
Toxaphene	-	<0.1	<0.1	-	0.3

* Indicate units if different from µg/L.

Attachment: N/A

TABLE 12 (DIOXINS/FURAN COMPOUNDS)

Complete of Table 12 **is required** for **external outfalls**, as directed below. (Instructions, Pages 53-54)

1. Indicate which compound(s) are manufactured or used at the facility and provide a brief description of the conditions of its/their presence at the facility (check all that apply).

☐ 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) CASRN 93-76-5
☐ 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP) CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon) CASRN 136-25-4
☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel) CASRN 299-84-3
☐ 2,4,5-trichlorophenol (TCP) CASRN 95-95-4
☐ hexachlorophene (HCP) CASRN 70-30-4
☒ None of the above

Description: N/A

2. Does the applicant or anyone at the facility know or have any reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) or any congeners of TCDD may be present in the effluent proposed for discharge?

☐ Yes ☒ No

Description: N/A

If **yes** to either Items a **or** b, complete Table 12 as instructed.

Table 12 for Outfall No.: N/A
Samples are (check one): ☐ Composites ☐ Grabs

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDD	1					10
1,2,3,7,8-PeCDD	1.0					50
2,3,7,8-HxCDDs	0.1					50
1,2,3,4,6,7,8-HpCDD	0.01					50
2,3,7,8-TCDF	0.1					10
1,2,3,7,8-PeCDF	0.03					50
2,3,4,7,8-PeCDF	0.3					50
2,3,7,8-HxCDFs	0.1					50
2,3,4,7,8-HpCDFs	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					500
PCB 81	0.0003					500
PCB 126	0.1					500
PCB 169	0.03					500
Total						

TABLE 13 (HAZARDOUS SUBSTANCES)

Complete Table 13 **is required** for all **external outfalls** as directed below. (Instructions, Page 54)

1. Are there any pollutants listed in the instructions (pages 55-62) believed present in the discharge?

☒ Yes ☐ No

3. Are there pollutants listed in Item 1.c. of Technical Report 1.0 which are believed present in the discharge and have not been analytically quantified elsewhere in this application?

☐ Yes ☒ No

If **yes** to either Items a **or** b, complete Table 13 as instructed.

Table 13 for Outfall No.: 001

Samples are (check one): ☒ **Composites** ☐ **Grabs**

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
Methanol	67-56-1	<2000	-	-	-	EPA 8015C
Vanadium	7440-62-2	12.9	-	-	-	EPA 200.8
Xylenes, total	1330-20-7	<2	-	-	-	EPA 624.1

WORKSHEET 2.0
POLLUTANT ANALYSES REQUIREMENTS

Worksheet 2.0 **is required** for all applications submitted for a TPDES permit. Worksheet 2.0 is not required for applications for a permit to dispose of all wastewater by land disposal or for discharges solely of stormwater associated with industrial activities.

i. LABORATORY ACCREDITATION (Instructions, Page 49)

Effective July 1, 2008, all laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification* with the following general exemptions:

a. The laboratory is an in-house laboratory and is:
   - periodically inspected by the TCEQ; or

1. located in another state and is accredited or inspected by that state; or
   i. performing work for another company with a unit located in the same site; or
   ii. performing pro bono work for a governmental agency or charitable organization.
1. The laboratory is accredited under federal law.
2. The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
3. The laboratory supplies data for which the TCEQ does not offer accreditation.

Review *30 TAC Chapter 25* for specific requirements. The following certification statement shall be signed and submitted with every application. See Instructions, Page 32, for a list of approved signatories.

I, (see certification on pg. 1 of Worksheet 2 for Outfall 001), certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*.

_____
(Signature)

1. GENERAL TESTING REQUIREMENTS (Instructions, Pages 49-51)

1. Provide the date range of all sampling events conducted to obtain the analytical data submitted with this application (e.g., 05/01/2018-05/30/2018): 10/04/2020 – 10/16/2020

2. ☒ Check the box to confirm all samples were collected no more than 12 months prior to the date of application submittal.

3. Read the general testing requirements in the instructions for important information about sampling, test methods, and MALs. If a contact laboratory was used, attach a list which includes the name, contact information, and pollutants analyzed for each laboratory/firm. **Attachment:** T-3 Laboratories for Outfall Analyses

4. SPECIFIC TESTING REQUIREMENTS (Instructions, Pages 51-62)

Attach correspondence from TCEQ approving submittal of less than the required number of samples, if applicable. **Attachment:** Analyses for 2 samples are provided in this worksheet. Dry weather has delayed taking additional samples because the outfall discharge is primarily stormwater. Lyondell will be providing analyses for an additional 2 samples for Tables 1 and 2 once these samples can be collected.

TABLE 1 and TABLE 2 (Instructions, Page 50)

Completion of Tables 1 and 2 **is required** for **all external outfalls** for all TPDES permit applications.

Table 1 for Outfall No.: 002

Samples are (check one): ☐ **Composite** ☒ **Grab**

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
BOD (5-day)	3	3	-	-
CBOD (5-day)	<2	2	-	-
Chemical oxygen demand	27	25	-	-
Total organic carbon	35	9	-	-
Dissolved oxygen	10.28	5.98	-	-
Ammonia nitrogen	<0.25	<0.25	-	-
Total suspended solids	10	8	-	-
Nitrate nitrogen	<0.5	<0.5	-	-
Total organic nitrogen	7.59	1.15	-	-
Total phosphorus	0.28	0.17	-	-
Oil and grease	5	5	-	-
Total residual chlorine	0.03	0.02	-	-
Total dissolved solids	529	341	-	-
Sulfate	104	79.7	-	-
Chloride	94.9	63.3	-	-
Fluoride	<0.5	<0.5	-	-
Total alkalinity (mg/L as $CaCO_3$)	131	124	-	-
Temperature (°F)	78.6	66.9	-	-
pH (standard units)	8.82	7.81	-	-

Table 2 for Outfall No.: 002

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Aluminum, total	169	236	-	-	2.5
Antimony, total	2.1	2.3	-	-	5
Arsenic, total	6.3	4.8	-	-	0.5
Barium, total	115	111	-	-	3
Beryllium, total	<0.4	<0.4	-	-	0.5
Cadmium, total	<0.4	<0.4	-	-	1

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Chromium, total	0.8	0.9	-	-	3
Chromium, hexavalent	<3.4	<3.4	-	-	3
Chromium, trivalent	0.8	0.9	-	-	N/A
Copper, total	8.3	8.5	-	-	2
Cyanide, available	<1.49 [CN-avail] <0.785 [CN-free]	<1.49 [CN-avail] <0.785 [CN-free]	-	-	2/10
Lead, total	0.6	0.5	-	-	0.5
Mercury, total	0.0039	0.00312	-	-	0.005/0.0005
Nickel, total	4.6	2.2	-	-	2
Selenium, total	<3.2	<3.2	-	-	5
Silver, total	<0.4	<0.4	-	-	0.5
Thallium, total	<0.4	<0.4	-	-	0.5
Zinc, total	20.5	30.4	-	-	5.0

TABLE 3 (Instructions, Page 50)

Completion of Table 3 **is required** for all **external outfalls** which discharge process wastewater.

Partial completion of Table 3 **is required** for all **external outfalls** which discharge non-process wastewater and stormwater associated with industrial activities commingled with other wastestreams (see instructions for additional guidance).

Table 3 for Outfall No.: 002

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Acrylonitrile	<3	-	-	-	50
Anthracene	<0.39	-	-	-	10
Benzene	<1	-	-	-	10
Benzidine	<0.74	-	-	-	50
Benzo(a)anthracene	<0.43	-	-	-	5
Benzo(a)pyrene	<0.95	-	-	-	5
Bis(2-chloroethyl)ether	<0.81	-	-	-	10
Bis(2-ethylhexyl)phthalate	<2.46	-	-	-	10
Bromodichloromethane [Dichlorobromomethane]	<1	-	-	-	10
Bromoform	<1	-	-	-	10
Carbon tetrachloride	<1	-	-	-	2
Chlorobenzene	<1	-	-	-	10
Chlorodibromomethane [Dibromochloromethane]	<1	-	-	-	10
Chloroform	<1	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Chrysene	<0.64	-	-	-	5
m-Cresol [3-Methylphenol]	<4.48†	-	-	-	10
o-Cresol [2-Methylphenol]	<2.24	-	-	-	10
p-Cresol [4-Methylphenol]	<1.48†	-	-	-	10
1,2-Dibromoethane	<1	-	-	-	10
m-Dichlorobenzene [1,3-Dichlorobenzene]	<0.59	-	-	-	10
o-Dichlorobenzene [1,2-Dichlorobenzene]	<0.46	-	-	-	10
p-Dichlorobenzene [1,4-Dichlorobenzene]	<0.28	-	-	-	10
3,3'-Dichlorobenzidine	<0.99	-	-	-	5
1,2-Dichloroethane	<1	-	-	-	10
1,1-Dichloroethene [1,1-Dichloroethylene]	<1	-	-	-	10
Dichloromethane [Methylene chloride]	<1	-	-	-	20
1,2-Dichloropropane	<1	-	-	-	10
1,3-Dichloropropene [1,3-Dichloropropylene]	<1	-	-	-	10
2,4-Dimethylphenol	<0.59	-	-	-	10
Di-n-Butyl phthalate	<1.37	-	-	-	10
Ethylbenzene	<1	-	-	-	10
Fluoride	<500	<500	-	-	500
Hexachlorobenzene	<0.77	-	-	-	5
Hexachlorobutadiene	<0.46	-	-	-	10
Hexachlorocyclopentadiene	<1.55	-	-	-	10
Hexachloroethane	<0.53	-	-	-	20
Methyl ethyl ketone	<1	-	-	-	50
Nitrobenzene	<1.02	-	-	-	10
N-Nitrosodiethylamine	<5.6	-	-	-	20
N-Nitroso-di-n-butylamine	<5.6	-	-	-	20
Nonylphenol	<1.28	-	-	-	333
Pentachlorobenzene	<3.36	-	-	-	20
Pentachlorophenol	<0.56	-	-	-	5
Phenanthrene	<0.49	-	-	-	10
Polychlorinated biphenyls (PCBs) (**)	<0.02	-	-	-	0.2
Pyridine	<0.39	-	-	-	20
1,2,4,5-Tetrachlorobenzene	<5.6	-	-	-	20
1,1,2,2-Tetrachloroethane	<1	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Tetrachloroethene [Tetrachloroethylene]	<1	-	-	-	10
Toluene	<1	-	-	-	10
1,1,1-Trichloroethane	<1	-	-	-	10
1,1,2-Trichloroethane	<1	-	-	-	10
Trichloroethene [Trichloroethylene]	<1	-	-	-	10
2,4,5-Trichlorophenol	<0.95	-	-	-	50
TTHM (Total trihalomethanes)	<2	-	-	-	10
Vinyl chloride	<1	-	-	-	10

(*) Indicate units if different from µg/L.

(**) Total of detects for PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016. If all non-detects, enter the highest non-detect preceded by a "<".

†Semivolatiles were analyzed by EPA Method 625.1. TCEQ does not offer accreditation for m-cresol by 625.1. Laboratory reported m+p-cresol as co-eluted. Laboratory's accreditation certificate does not include p-cresol by 625.1.

TABLE 4 (Instructions, Pages 50-51)

Partial completion of Table 4 **is required** for each **external outfall** based on the conditions below.

a. Tributyltin

Is this facility an industrial/commercial facility which currently or proposes to directly dispose of wastewater from the types of operations listed below or a domestic facility which currently or proposes to receive wastewater from the types of industrial/commercial operations listed below?

☐ Yes ☒ No

If **yes**, check the box next to each of the following criteria which apply and provide the appropriate testing results in Table 4 below (check all that apply).

☐ Manufacturers and formulators of tributyltin or related compounds.

☐ Painting of ships, boats and marine structures.

☐ Ship and boat building and repairing.

☐ Ship and boat cleaning, salvage, wrecking and scaling.

☐ Operation and maintenance of marine cargo handling facilities and marinas.

☐ Facilities engaged in wood preserving.

☐ Any other industrial/commercial facility for which tributyltin is known to be present, or for which there is any reason to believe that tributyltin may be present in the effluent.

b. Enterococci (discharge to saltwater)

iii. This facility discharges/proposes to discharge directly into saltwater receiving waters **and** Enterococci bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

1. Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

c. E. coli (discharge to freshwater)

ii. This facility discharges/proposes to discharge directly into freshwater receiving waters **and** *E. coli* bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

1. Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

Table 4 for Outfall No.: N/A

Samples are (check one): ☐ **Composites** ☐ **Grabs**

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Tributyltin (µg/L)					0.010

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Enterococci (cfu or MPN/100 mL)					N/A
E. coli (cfu or MPN/100 mL)					N/A

TABLE 5 (Instructions, Page 51)

Completion of Table 5 **is required** for all **external outfalls** which discharge process wastewater from a facility which manufactures or formulates pesticides or herbicides or other wastewaters which may contain pesticides or herbicides.

If this facility does not/will not manufacture or formulate pesticides or herbicides and does not/will not discharge other wastewaters which may contain pesticides or herbicides, check N/A.

☒ N/A

Table 5 for Outfall No.: N/A
Samples are (check one): ☐ **Composites** ☐ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Aldrin					0.01
Carbaryl					5
Chlordane					0.2
Chlorpyrifos					0.05
4,4'-DDD					0.1
4,4'-DDE					0.1
4,4'-DDT					0.02
2,4-D					0.7
Danitol [Fenpropathrin]					—
Demeton					0.20
Diazinon					0.5/0.1
Dicofol [Kelthane]					1
Dieldrin					0.02
Diuron					0.090
Endosulfan I (*alpha*)					0.01
Endosulfan II (*beta*)					0.02
Endosulfan sulfate					0.1
Endrin					0.02
Guthion [Azinphos methyl]					0.1
Heptachlor					0.01
Heptachlor epoxide					0.01
Hexachlorocyclohexane (*alpha*)					0.05
Hexachlorocyclohexane (*beta*)					0.05
Hexachlorocyclohexane (*gamma*) [Lindane]					0.05
Hexachlorophene					10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Malathion					0.1
Methoxychlor					2.0
Mirex					0.02
Parathion (ethyl)					0.1
Toxaphene					0.3
2,4,5-TP [Silvex]					0.3

* Indicate units if different from µg/L.

TABLE 6 (Instructions, Page 52)

Completion of Table 6 **is required** for all **external outfalls**.

Table 6 for Outfall No.: 002
Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutants	Believed Present	Believed Absent	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)	MAL (µg/L)*
Bromide	☐	☒	<0.5	-	-	-	400
Color (PCU)	☒	☐	10	-	-	-	—
Nitrate-Nitrite (as N)	☒	☐	<0.5	-	-	-	—
Sulfide (as S)	☐	☒	<0.05	-	-	-	—
Sulfite (as SO_3)	☐	☒	<1	<1	-	-	—
Surfactants	☒	☐	0.0357	-	-	-	—
Boron, total	☒	☐	0.183	-	-	-	20
Cobalt, total	☒	☐	0.0007	-	-	-	0.3
Iron, total	☒	☐	0.296	-	-	-	7
Magnesium, total	☒	☐	6.54	-	-	-	20
Manganese, total	☒	☐	0.0235	-	-	-	0.5
Molybdenum, total	☒	☐	0.0152	-	-	-	1
Tin, total	☐	☒	<0.004	-	-	-	5
Titanium, total	☐	☒	<0.0044	-	-	-	30

* Indicate units if different from µg/L.

TABLE 7 (Instructions, Page 52)

Check the box next to any of the industrial categories applicable to this facility. If no categories are applicable, check N/A. If GC/MS testing is required, check the box provided to confirm the testing results for the appropriate parameters are provided with the application.

☒ N/A

Table 7 for Applicable Industrial Categories

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
☐ Adhesives and Sealants		☐ Yes	☐ Yes	☐ Yes	No
☐ Aluminum Forming	467	☐ Yes	☐ Yes	☐ Yes	No
☐ Auto and Other Laundries		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Battery Manufacturing	461	☐ Yes	No	☐ Yes	No
☐ Coal Mining	434	No	No	No	No
☐ Coil Coating	465	☐ Yes	☐ Yes	☐ Yes	No
☐ Copper Forming	468	☐ Yes	☐ Yes	☐ Yes	No
☐ Electric and Electronic Components	469	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Electroplating	413	☐ Yes	☐ Yes	☐ Yes	No
☐ Explosives Manufacturing	457	No	☐ Yes	☐ Yes	No
☐ Foundries		☐ Yes	☐ Yes	☐ Yes	No
☐ Gum and Wood Chemicals - Subparts A,B,C,E	454	☐ Yes	☐ Yes	No	No
☐ Gum and Wood Chemicals - Subparts D,F	454	☐ Yes	☐ Yes	☐ Yes	No
☐ Inorganic Chemicals Manufacturing	415	☐ Yes	☐ Yes	☐ Yes	No
☐ Iron and Steel Manufacturing	420	☐ Yes	☐ Yes	☐ Yes	No
☐ Leather Tanning and Finishing	425	☐ Yes	☐ Yes	☐ Yes	No
☐ Mechanical Products Manufacturing		☐ Yes	☐ Yes	☐ Yes	No
☐ Nonferrous Metals Manufacturing	421,471	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Ore Mining - Subpart B	440	No	☐ Yes	No	No
☐ Organic Chemicals Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Paint and Ink Formulation	446,447	☐ Yes	☐ Yes	☐ Yes	No
☐ Pesticides	455	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Petroleum Refining	419	☐ Yes	No	No	No
☐ Pharmaceutical Preparations	439	☐ Yes	☐ Yes	☐ Yes	No
☐ Photographic Equipment and Supplies	459	☐ Yes	☐ Yes	☐ Yes	No
☐ Plastic and Synthetic Materials Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Plastic Processing	463	☐ Yes	No	No	No
☐ Porcelain Enameling	466	No	No	No	No
☐ Printing and Publishing		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Pulp and Paperboard Mills - Subpart C	430	☐ *	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subparts F, K	430	☐ *	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts A, B, D, G, H	430	☐ Yes	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts I, J, L	430	☐ Yes	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subpart E	430	☐ Yes	☐ Yes	☐ Yes	☐ *
☐ Rubber Processing	428	☐ Yes	☐ Yes	☐ Yes	No
☐ Soap and Detergent Manufacturing	417	☐ Yes	☐ Yes	☐ Yes	No
☐ Steam Electric Power Plants	423	☐ Yes	☐ Yes	No	No

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
☐ Textile Mills (Not Subpart C)	410	☐ Yes	☐ Yes	☐ Yes	No
☐ Timber Products Processing	429	☐ Yes	☐ Yes	☐ Yes	☐ Yes

* Test if believed present.

TABLES 8, 9, 10, and 11 (Instructions, Page 52)

Completion of Tables 8, 9, 10, and 11 **is required** as specified in Table 7 for all **external outfalls** that contain process wastewater.

Completion of Tables 8, 9, 10, and 11 **may be required** for types of industry not specified in Table 7 for specific parameters that are believed to be present in the wastewater.

Table 8 for Outfall No.: 002 : Volatile Compounds
Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acrolein	<6	-	-	-	50
Acrylonitrile	<3	-	-	-	50
Benzene	<1	-	-	-	10
Bromoform	<1	-	-	-	10
Carbon tetrachloride	<1	-	-	-	2
Chlorobenzene	<1	-	-	-	10
Chlorodibromomethane	<1	-	-	-	10
Chloroethane	<1	-	-	-	50
2-Chloroethylvinyl ether	<6	-	-	-	10
Chloroform	<1	-	-	-	10
Dichlorobromomethane [Bromodichloromethane]	<1	-	-	-	10
1,1-Dichloroethane	<1	-	-	-	10
1,2-Dichloroethane	<1	-	-	-	10
1,1-Dichloroethylene [1,1-Dichloroethene]	<1	-	-	-	10
1,2-Dichloropropane	<1	-	-	-	10
1,3-Dichloropropylene [1,3-Dichloropropene]	<1	-	-	-	10
Ethylbenzene	<1	-	-	-	10
Methyl bromide [Bromomethane]	<2	-	-	-	50
Methyl chloride [Chloromethane]	<1	-	-	-	50
Methylene chloride [Dichloromethane]	<1	-	-	-	20
1,1,2,2-Tetrachloroethane	<1	-	-	-	10
Tetrachloroethylene [Tetrachloroethene]	<1	-	-	-	10
Toluene	<1	-	-	-	10
1,2-Trans-dichloroethylene [1,2-Trans-dichloroethene]	<1	-	-	-	10
1,1,1-Trichloroethane	<1	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
1,1,2-Trichloroethane	<1	-	-	-	10
Trichloroethylene [Trichloroethene]	<1	-	-	-	10
Vinyl chloride	<1	-	-	-	10

* Indicate units if different from µg/L.

Table 9 for Outfall No.: 002 : Acid Compounds
Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
2-Chlorophenol	<0.56	-	-	-	10
2,4-Dichlorophenol	<0.77	-	-	-	10
2,4-Dimethylphenol	<0.59	-	-	-	10
4,6-Dinitro-o-cresol	<0.74	-	-	-	50
2,4-Dinitrophenol	<1.58	-	-	-	50
2-Nitrophenol	<0.99	-	-	-	20
4-Nitrophenol	<1.27	-	-	-	50
p-Chloro-m-cresol	<0.59	-	-	-	10
Pentachlorophenol	<0.56	-	-	-	5
Phenol	<0.49	-	-	-	10
2,4,6-Trichlorophenol	<0.88	-	-	-	10

* Indicate units if different from µg/L.

Table 10 for Outfall No.: 002 : Base/Neutral Compounds
Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acenaphthene	<0.31	-	-	-	10
Acenaphthylene	<0.53	-	-	-	10
Anthracene	<0.39	-	-	-	10
Benzidine	<0.74	-	-	-	50
Benzo(a)anthracene	<0.43	-	-	-	5
Benzo(a)pyrene	<0.95	-	-	-	5
3,4-Benzofluoranthene [Benzo(b)fluoranthene]	<0.64	-	-	-	10
Benzo(ghi)perylene	<0.71	-	-	-	20
Benzo(k)fluoranthene	<0.64	-	-	-	5
Bis(2-chloroethoxy)methane	<0.39	-	-	-	10
Bis(2-chloroethyl)ether	<0.81	-	-	-	10
Bis(2-chloroisopropyl)ether	<0.95	-	-	-	10
Bis(2-ethylhexyl)phthalate	<2.46	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
4-Bromophenyl phenyl ether	<0.46	-	-	-	10
Butylbenzyl phthalate	<0.77	-	-	-	10
2-Chloronaphthalene	<0.31	-	-	-	10
4-Chlorophenyl phenyl ether	<0.74	-	-	-	10
Chrysene	<0.64	-	-	-	5
Dibenzo(a,h)anthracene	<0.77	-	-	-	5
1,2-Dichlorobenzene [o-Dichlorobenzene]	<0.46	-	-	-	10
1,3-Dichlorobenzene [m-Dichlorobenzene]	<0.59	-	-	-	10
1,4-Dichlorobenzene [p-Dichlorobenzene]	<0.28	-	-	-	10
3,3'-Dichlorobenzidine	<0.99	-	-	-	5
Diethyl phthalate	<0.71	-	-	-	10
Dimethyl phthalate	<0.81	-	-	-	10
Di-n-butyl phthalate	<1.37	-	-	-	10
2,4-Dinitrotoluene	<1.58	-	-	-	10
2,6-Dinitrotoluene	<1.37	-	-	-	10
Di-n-octyl phthalate	<3.09	-	-	-	10
1,2-Diphenylhydrazine (as Azobenzene)	<0.25	-	-	-	20
Fluoranthene	<0.49	-	-	-	10
Fluorene	<0.53	-	-	-	10
Hexachlorobenzene	<0.77	-	-	-	5
Hexachlorobutadiene	<0.46	-	-	-	10
Hexachlorocyclopentadiene	<1.55	-	-	-	10
Hexachloroethane	<0.53	-	-	-	20
Indeno(1,2,3-cd)pyrene	<0.25	-	-	-	5
Isophorone	<0.31	-	-	-	10
Naphthalene	<0.35	-	-	-	10
Nitrobenzene	<1.02	-	-	-	10
N-Nitrosodimethylamine	<0.88	-	-	-	50
N-Nitrosodi-n-propylamine	<0.81	-	-	-	20
N-Nitrosodiphenylamine	<0.53	-	-	-	20
Phenanthrene	<0.49	-	-	-	10
Pyrene	<0.64	-	-	-	10
1,2,4-Trichlorobenzene	<0.59	-	-	-	10

* Indicate units if different from µg/L.

Table 11 for Outfall No.: 002 : Pesticides
Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Aldrin	<0.003	-	-	-	0.01
alpha-BHC [alpha-Hexachlorocyclohexane]	<0.008	-	-	-	0.05
beta-BHC [beta-Hexachlorocyclohexane]	<0.01	-	-	-	0.05
gamma-BHC [gamma-Hexachlorocyclohexane]	<0.005	-	-	-	0.05
delta-BHC [delta-Hexachlorocyclohexane]	<0.004	-	-	-	0.05
Chlordane	<0.1	-	-	-	0.2
4,4'-DDT	<0.004	-	-	-	0.02
4,4'-DDE	<0.002	-	-	-	0.1
4,4'-DDD	<0.006	-	-	-	0.1
Dieldrin	<0.003	-	-	-	0.02
Endosulfan I (alpha)	<0.003	-	-	-	0.01
Endosulfan II (beta)	<0.004	-	-	-	0.02
Endosulfan sulfate	<0.003	-	-	-	0.1
Endrin	<0.004	-	-	-	0.02
Endrin aldehyde	<0.008	-	-	-	0.1
Heptachlor	<0.005	-	-	-	0.01
Heptachlor epoxide	<0.002	-	-	-	0.01
PCB 1242	<0.01	-	-	-	0.2
PCB 1254	<0.01	-	-	-	0.2
PCB 1221	<0.01	-	-	-	0.2
PCB 1232	<0.01	-	-	-	0.2
PCB 1248	<0.01	-	-	-	0.2
PCB 1260	<0.01	-	-	-	0.2
PCB 1016	<0.02	-	-	-	0.2
Toxaphene	<0.1	-	-	-	0.3

* Indicate units if different from µg/L.

Attachment: N/A

TABLE 12 (DIOXINS/FURAN COMPOUNDS)

Complete of Table 12 **is required** for **external outfalls**, as directed below. (Instructions, Pages 53-54)

1. Indicate which compound(s) are manufactured or used at the facility and provide a brief description of the conditions of its/their presence at the facility (check all that apply).

☐ 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) CASRN 93-76-5
☐ 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP) CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon) CASRN 136-25-4
☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel) CASRN 299-84-3
☐ 2,4,5-trichlorophenol (TCP) CASRN 95-95-4
☐ hexachlorophene (HCP) CASRN 70-30-4
☒ None of the above

Description: N/A

2. Does the applicant or anyone at the facility know or have any reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) or any congeners of TCDD may be present in the effluent proposed for discharge?

☐ Yes ☒ No

Description: N/A

If **yes** to either Items a **or** b, complete Table 12 as instructed.

Table 12 for Outfall No.: N/A
Samples are (check one): ☐ Composites ☐ Grabs

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDD	1					10
1,2,3,7,8-PeCDD	1.0					50
2,3,7,8-HxCDDs	0.1					50
1,2,3,4,6,7,8-HpCDD	0.01					50
2,3,7,8-TCDF	0.1					10
1,2,3,7,8-PeCDF	0.03					50
2,3,4,7,8-PeCDF	0.3					50
2,3,7,8-HxCDFs	0.1					50
2,3,4,7,8-HpCDFs	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					500
PCB 81	0.0003					500
PCB 126	0.1					500
PCB 169	0.03					500
Total						

TABLE 13 (HAZARDOUS SUBSTANCES)

Complete Table 13 **is required** for all **external outfalls** as directed below. (Instructions, Page 54)

1. Are there any pollutants listed in the instructions (pages 55-62) believed present in the discharge?

☒ Yes ☐ No

3. Are there pollutants listed in Item 1.c. of Technical Report 1.0 which are believed present in the discharge and have not been analytically quantified elsewhere in this application?

☐ Yes ☒ No

If **yes** to either Items a **or** b, complete Table 13 as instructed.

Table 13 for Outfall No.: 002

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
Vanadium	7440-62-2	4.7	-	-	-	EPA 200.8

WORKSHEET 2.0
POLLUTANT ANALYSES REQUIREMENTS

Worksheet 2.0 **is required** for all applications submitted for a TPDES permit. Worksheet 2.0 is not required for applications for a permit to dispose of all wastewater by land disposal or for discharges solely of stormwater associated with industrial activities.

i. LABORATORY ACCREDITATION (Instructions, Page 49)

Effective July 1, 2008, all laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification* with the following general exemptions:

a. The laboratory is an in-house laboratory and is:
   - periodically inspected by the TCEQ; or

1. located in another state and is accredited or inspected by that state; or
   i. performing work for another company with a unit located in the same site; or
   ii. performing pro bono work for a governmental agency or charitable organization.
1. The laboratory is accredited under federal law.
2. The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
3. The laboratory supplies data for which the TCEQ does not offer accreditation.

Review *30 TAC Chapter 25* for specific requirements. The following certification statement shall be signed and submitted with every application. See Instructions, Page 32, for a list of approved signatories.

I, (see certification on pg. 1 of Worksheet 2 for Outfall 001), certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*.

_____
(Signature)

1. GENERAL TESTING REQUIREMENTS (Instructions, Pages 49-51)

1. Provide the date range of all sampling events conducted to obtain the analytical data submitted with this application (e.g., 05/01/2018-05/30/2018): 10/09/2020

2. ☒ Check the box to confirm all samples were collected no more than 12 months prior to the date of application submittal.

3. Read the general testing requirements in the instructions for important information about sampling, test methods, and MALs. If a contact laboratory was used, attach a list which includes the name, contact information, and pollutants analyzed for each laboratory/firm. **Attachment:** T-3 Laboratories for Outfall Analyses

4. SPECIFIC TESTING REQUIREMENTS (Instructions, Pages 51-62)

Attach correspondence from TCEQ approving submittal of less than the required number of samples, if applicable. **Attachment:** Analyses for 1 sample are provided in this worksheet. Dry weather has delayed taking additional samples because the outfall discharge is primarily stormwater. Lyondell will be providing analyses for an additional 3 samples for Tables 1 and 2 and 1 sample for volatiles in Tables 3 and 8 and color/surfactants in Table 6 once these samples can be collected.

TABLE 1 and TABLE 2 (Instructions, Page 50)

Completion of Tables 1 and 2 **is required** for **all external outfalls** for all TPDES permit applications.

Table 1 for Outfall No.: 003

Samples are (check one): ☐ **Composite** ☒ **Grab**

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
BOD (5-day)	3	-	-	-
CBOD (5-day)	<2	-	-	-
Chemical oxygen demand	27	-	-	-
Total organic carbon	5	-	-	-
Dissolved oxygen	7.35	-	-	-
Ammonia nitrogen	<0.25	-	-	-
Total suspended solids	36	-	-	-
Nitrate nitrogen	0.56	-	-	-
Total organic nitrogen	2.36	-	-	-
Total phosphorus	0.14	-	-	-
Oil and grease	5	-	-	-
Total residual chlorine	0.02	-	-	-
Total dissolved solids	290	-	-	-
Sulfate	70.3	-	-	-
Chloride	31.9	-	-	-
Fluoride	<0.5	-	-	-
Total alkalinity (mg/L as $CaCO_3$)	96	-	-	-
Temperature (°F)	75.3	-	-	-
pH (standard units)	8.7	-	-	-

Table 2 for Outfall No.: 003

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Aluminum, total	1660	-	-	-	2.5
Antimony, total	1.3	-	-	-	5
Arsenic, total	5.1	-	-	-	0.5
Barium, total	75	-	-	-	3
Beryllium, total	<0.4	-	-	-	0.5
Cadmium, total	<0.4	-	-	-	1

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Chromium, total	3.7	-	-	-	3
Chromium, hexavalent	<3.4	-	-	-	3
Chromium, trivalent	3.7	-	-	-	N/A
Copper, total	5.6	-	-	-	2
Cyanide, available	<1.49 [CN-avail] <0.785 [CN-free]	-	-	-	2/10
Lead, total	1.5	-	-	-	0.5
Mercury, total	0.005447	-	-	-	0.005/0.0005
Nickel, total	2.7	-	-	-	2
Selenium, total	<3.2	-	-	-	5
Silver, total	<0.4	-	-	-	0.5
Thallium, total	<0.4	-	-	-	0.5
Zinc, total	63.3	-	-	-	5.0

TABLE 3 (Instructions, Page 50)

Completion of Table 3 **is required** for all **external outfalls** which discharge process wastewater.

Partial completion of Table 3 **is required** for all **external outfalls** which discharge non-process wastewater and stormwater associated with industrial activities commingled with other wastestreams (see instructions for additional guidance).

Table 3 for Outfall No.: 003

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Acrylonitrile	-	-	-	-	50
Anthracene	<0.57	-	-	-	10
Benzene	-	-	-	-	10
Benzidine	<1.08	-	-	-	50
Benzo(a)anthracene	<0.62	-	-	-	5
Benzo(a)pyrene	<1.39	-	-	-	5
Bis(2-chloroethyl)ether	<1.18	-	-	-	10
Bis(2-ethylhexyl)phthalate	<3.61	-	-	-	10
Bromodichloromethane [Dichlorobromomethane]	-	-	-	-	10
Bromoform	-	-	-	-	10
Carbon tetrachloride	-	-	-	-	2
Chlorobenzene	-	-	-	-	10
Chlorodibromomethane [Dibromochloromethane]	-	-	-	-	10
Chloroform	-	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Chrysene	<0.93	-	-	-	5
m-Cresol [3-Methylphenol]	<6.56†	-	-	-	10
o-Cresol [2-Methylphenol]	<3.28	-	-	-	10
p-Cresol [4-Methylphenol]	<6.56†	-	-	-	10
1,2-Dibromoethane	-	-	-	-	10
m-Dichlorobenzene [1,3-Dichlorobenzene]	<0.87	-	-	-	10
o-Dichlorobenzene [1,2-Dichlorobenzene]	<0.67	-	-	-	10
p-Dichlorobenzene [1,4-Dichlorobenzene]	<0.41	-	-	-	10
3,3'-Dichlorobenzidine	<1.44	-	-	-	5
1,2-Dichloroethane	-	-	-	-	10
1,1-Dichloroethene [1,1-Dichloroethylene]	-	-	-	-	10
Dichloromethane [Methylene chloride]	-	-	-	-	20
1,2-Dichloropropane	-	-	-	-	10
1,3-Dichloropropene [1,3-Dichloropropylene]	-	-	-	-	10
2,4-Dimethylphenol	<0.87	-	-	-	10
Di-n-Butyl phthalate	<2	-	-	-	10
Ethylbenzene	-	-	-	-	10
Fluoride	<500	-	-	-	500
Hexachlorobenzene	<1.13	-	-	-	5
Hexachlorobutadiene	<0.67	-	-	-	10
Hexachlorocyclopentadiene	<2.26	-	-	-	10
Hexachloroethane	<0.77	-	-	-	20
Methyl ethyl ketone	-	-	-	-	50
Nitrobenzene	<1.49	-	-	-	10
N-Nitrosodiethylamine	<8.2	-	-	-	20
N-Nitroso-di-n-butylamine	<8.2	-	-	-	20
Nonylphenol	<1.68	-	-	-	333
Pentachlorobenzene	<4.92	-	-	-	20
Pentachlorophenol	<0.82	-	-	-	5
Phenanthrene	<0.72	-	-	-	10
Polychlorinated biphenyls (PCBs) (**)	<0.02	-	-	-	0.2
Pyridine	<0.57	-	-	-	20
1,2,4,5-Tetrachlorobenzene	<8.2	-	-	-	20
1,1,2,2-Tetrachloroethane	-	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Tetrachloroethene [Tetrachloroethylene]	-				10
Toluene	-				10
1,1,1-Trichloroethane	-				10
1,1,2-Trichloroethane	-				10
Trichloroethene [Trichloroethylene]	-				10
2,4,5-Trichlorophenol	<1.39				50
TTHM (Total trihalomethanes)	-				10
Vinyl chloride	-				10

(*) Indicate units if different from µg/L.

(**) Total of detects for PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016. If all non-detects, enter the highest non-detect preceded by a "<".

†Semivolatiles were analyzed by EPA Method 625.1. TCEQ does not offer accreditation for m-cresol by 625.1. Laboratory reported m+p-cresol as co-eluted. Laboratory's accreditation certificate does not include p-cresol by 625.1.

TABLE 4 (Instructions, Pages 50-51)

Partial completion of Table 4 **is required** for each **external outfall** based on the conditions below.

a. Tributyltin

Is this facility an industrial/commercial facility which currently or proposes to directly dispose of wastewater from the types of operations listed below or a domestic facility which currently or proposes to receive wastewater from the types of industrial/commercial operations listed below?

☐ Yes ☒ No

If **yes**, check the box next to each of the following criteria which apply and provide the appropriate testing results in Table 4 below (check all that apply).

☐ Manufacturers and formulators of tributyltin or related compounds.

☐ Painting of ships, boats and marine structures.

☐ Ship and boat building and repairing.

☐ Ship and boat cleaning, salvage, wrecking and scaling.

☐ Operation and maintenance of marine cargo handling facilities and marinas.

☐ Facilities engaged in wood preserving.

☐ Any other industrial/commercial facility for which tributyltin is known to be present, or for which there is any reason to believe that tributyltin may be present in the effluent.

b. Enterococci (discharge to saltwater)

iii. This facility discharges/proposes to discharge directly into saltwater receiving waters **and** Enterococci bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

1. Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

c. E. coli (discharge to freshwater)

ii. This facility discharges/proposes to discharge directly into freshwater receiving waters **and** *E. coli* bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

1. Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

Table 4 for Outfall No.: N/A

Samples are (check one): ☐ **Composites** ☐ **Grabs**

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Tributyltin (µg/L)					0.010

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Enterococci (cfu or MPN/100 mL)					N/A
E. coli (cfu or MPN/100 mL)					N/A

TABLE 5 (Instructions, Page 51)

Completion of Table 5 **is required** for all **external outfalls** which discharge process wastewater from a facility which manufactures or formulates pesticides or herbicides or other wastewaters which may contain pesticides or herbicides.

If this facility does not/will not manufacture or formulate pesticides or herbicides and does not/will not discharge other wastewaters which may contain pesticides or herbicides, check N/A.

☒ N/A

Table 5 for Outfall No.: N/A
Samples are (check one): ☐ **Composites** ☐ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Aldrin					0.01
Carbaryl					5
Chlordane					0.2
Chlorpyrifos					0.05
4,4'-DDD					0.1
4,4'-DDE					0.1
4,4'-DDT					0.02
2,4-D					0.7
Danitol [Fenpropathrin]					—
Demeton					0.20
Diazinon					0.5/0.1
Dicofol [Kelthane]					1
Dieldrin					0.02
Diuron					0.090
Endosulfan I (*alpha*)					0.01
Endosulfan II (*beta*)					0.02
Endosulfan sulfate					0.1
Endrin					0.02
Guthion [Azinphos methyl]					0.1
Heptachlor					0.01
Heptachlor epoxide					0.01
Hexachlorocyclohexane (*alpha*)					0.05
Hexachlorocyclohexane (*beta*)					0.05
Hexachlorocyclohexane (*gamma*) [Lindane]					0.05
Hexachlorophene					10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Malathion					0.1
Methoxychlor					2.0
Mirex					0.02
Parathion (ethyl)					0.1
Toxaphene					0.3
2,4,5-TP [Silvex]					0.3

* Indicate units if different from µg/L.

TABLE 6 (Instructions, Page 52)

Completion of Table 6 **is required** for all **external outfalls**.

Table 6 for Outfall No.: 003
Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutants	Believed Present	Believed Absent	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)	MAL (µg/L)*
Bromide	☐	☒	<0.5	-	-	-	400
Color (PCU)	☒	☐	-	-	-	-	—
Nitrate-Nitrite (as N)	☒	☐	0.56	-	-	-	—
Sulfide (as S)	☐	☒	<0.05	-	-	-	—
Sulfite (as SO_3)	☐	☒	<1	-	-	-	—
Surfactants	☒	☐	-	-	-	-	—
Boron, total	☒	☐	0.091	-	-	-	20
Cobalt, total	☒	☐	0.0005	-	-	-	0.3
Iron, total	☒	☐	1.24	-	-	-	7
Magnesium, total	☒	☐	3.42	-	-	-	20
Manganese, total	☒	☐	0.0314	-	-	-	0.5
Molybdenum, total	☒	☐	0.0639	-	-	-	1
Tin, total	☐	☒	<0.004	-	-	-	5
Titanium, total	☐	☒	<0.0044	-	-	-	30

* Indicate units if different from µg/L.

TABLE 7 (Instructions, Page 52)

Check the box next to any of the industrial categories applicable to this facility. If no categories are applicable, check N/A. If GC/MS testing is required, check the box provided to confirm the testing results for the appropriate parameters are provided with the application.

☒ N/A

Table 7 for Applicable Industrial Categories

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
☐ Adhesives and Sealants		☐ Yes	☐ Yes	☐ Yes	No
☐ Aluminum Forming	467	☐ Yes	☐ Yes	☐ Yes	No
☐ Auto and Other Laundries		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Battery Manufacturing	461	☐ Yes	No	☐ Yes	No
☐ Coal Mining	434	No	No	No	No
☐ Coil Coating	465	☐ Yes	☐ Yes	☐ Yes	No
☐ Copper Forming	468	☐ Yes	☐ Yes	☐ Yes	No
☐ Electric and Electronic Components	469	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Electroplating	413	☐ Yes	☐ Yes	☐ Yes	No
☐ Explosives Manufacturing	457	No	☐ Yes	☐ Yes	No
☐ Foundries		☐ Yes	☐ Yes	☐ Yes	No
☐ Gum and Wood Chemicals - Subparts A,B,C,E	454	☐ Yes	☐ Yes	No	No
☐ Gum and Wood Chemicals - Subparts D,F	454	☐ Yes	☐ Yes	☐ Yes	No
☐ Inorganic Chemicals Manufacturing	415	☐ Yes	☐ Yes	☐ Yes	No
☐ Iron and Steel Manufacturing	420	☐ Yes	☐ Yes	☐ Yes	No
☐ Leather Tanning and Finishing	425	☐ Yes	☐ Yes	☐ Yes	No
☐ Mechanical Products Manufacturing		☐ Yes	☐ Yes	☐ Yes	No
☐ Nonferrous Metals Manufacturing	421,471	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Ore Mining - Subpart B	440	No	☐ Yes	No	No
☐ Organic Chemicals Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Paint and Ink Formulation	446,447	☐ Yes	☐ Yes	☐ Yes	No
☐ Pesticides	455	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Petroleum Refining	419	☐ Yes	No	No	No
☐ Pharmaceutical Preparations	439	☐ Yes	☐ Yes	☐ Yes	No
☐ Photographic Equipment and Supplies	459	☐ Yes	☐ Yes	☐ Yes	No
☐ Plastic and Synthetic Materials Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Plastic Processing	463	☐ Yes	No	No	No
☐ Porcelain Enameling	466	No	No	No	No
☐ Printing and Publishing		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Pulp and Paperboard Mills - Subpart C	430	☐ *	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subparts F, K	430	☐ *	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts A, B, D, G, H	430	☐ Yes	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts I, J, L	430	☐ Yes	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subpart E	430	☐ Yes	☐ Yes	☐ Yes	☐ *
☐ Rubber Processing	428	☐ Yes	☐ Yes	☐ Yes	No
☐ Soap and Detergent Manufacturing	417	☐ Yes	☐ Yes	☐ Yes	No
☐ Steam Electric Power Plants	423	☐ Yes	☐ Yes	No	No

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
☐ Textile Mills (Not Subpart C)	410	☐ Yes	☐ Yes	☐ Yes	No
☐ Timber Products Processing	429	☐ Yes	☐ Yes	☐ Yes	☐ Yes

* Test if believed present.

TABLES 8, 9, 10, and 11 (Instructions, Page 52)

Completion of Tables 8, 9, 10, and 11 **is required** as specified in Table 7 for all **external outfalls** that contain process wastewater.

Completion of Tables 8, 9, 10, and 11 **may be required** for types of industry not specified in Table 7 for specific parameters that are believed to be present in the wastewater.

Table 8 for Outfall No.: 003 : Volatile Compounds
Samples are (check one): ☐ Composites ☐ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acrolein	-	-	-	-	50
Acrylonitrile	-	-	-	-	50
Benzene	-	-	-	-	10
Bromoform	-	-	-	-	10
Carbon tetrachloride	-	-	-	-	2
Chlorobenzene	-	-	-	-	10
Chlorodibromomethane	-	-	-	-	10
Chloroethane	-	-	-	-	50
2-Chloroethylvinyl ether	-	-	-	-	10
Chloroform	-	-	-	-	10
Dichlorobromomethane [Bromodichloromethane]	-	-	-	-	10
1,1-Dichloroethane	-	-	-	-	10
1,2-Dichloroethane	-	-	-	-	10
1,1-Dichloroethylene [1,1-Dichloroethene]	-	-	-	-	10
1,2-Dichloropropane	-	-	-	-	10
1,3-Dichloropropylene [1,3-Dichloropropene]	-	-	-	-	10
Ethylbenzene	-	-	-	-	10
Methyl bromide [Bromomethane]	-	-	-	-	50
Methyl chloride [Chloromethane]	-	-	-	-	50
Methylene chloride [Dichloromethane]	-	-	-	-	20
1,1,2,2-Tetrachloroethane	-	-	-	-	10
Tetrachloroethylene [Tetrachloroethene]	-	-	-	-	10
Toluene	-	-	-	-	10
1,2-Trans-dichloroethylene [1,2-Trans-dichloroethene]	-	-	-	-	10
1,1,1-Trichloroethane	-	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
1,1,2-Trichloroethane	-	-	-	-	10
Trichloroethylene [Trichloroethene]	-	-	-	-	10
Vinyl chloride	-	-	-	-	10

* Indicate units if different from µg/L.

Table 9 for Outfall No.: 003 : Acid Compounds
Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
2-Chlorophenol	<0.82	-	-	-	10
2,4-Dichlorophenol	<1.13	-	-	-	10
2,4-Dimethylphenol	<0.87	-	-	-	10
4,6-Dinitro-o-cresol	<1.08	-	-	-	50
2,4-Dinitrophenol	<2.31	-	-	-	50
2-Nitrophenol	<1.44	-	-	-	20
4-Nitrophenol	<1.85	-	-	-	50
p-Chloro-m-cresol	<0.87	-	-	-	10
Pentachlorophenol	<0.82	-	-	-	5
Phenol	<0.72	-	-	-	10
2,4,6-Trichlorophenol	<1.3	-	-	-	10

* Indicate units if different from µg/L.

Table 10 for Outfall No.: 003 : Base/Neutral Compounds
Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acenaphthene	<0.46	-	-	-	10
Acenaphthylene	<0.77	-	-	-	10
Anthracene	<0.57	-	-	-	10
Benzidine	<1.08	-	-	-	50
Benzo(a)anthracene	<0.62	-	-	-	5
Benzo(a)pyrene	<1.39	-	-	-	5
3,4-Benzofluoranthene [Benzo(b)fluoranthene]	<0.93	-	-	-	10
Benzo(ghi)perylene	<1.03	-	-	-	20
Benzo(k)fluoranthene	<0.93	-	-	-	5
Bis(2-chloroethoxy)methane	<0.57	-	-	-	10
Bis(2-chloroethyl)ether	<1.18	-	-	-	10
Bis(2-chloroisopropyl)ether	<1.39	-	-	-	10
Bis(2-ethylhexyl)phthalate	<3.61	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
4-Bromophenyl phenyl ether	<0.67	-	-	-	10
Butylbenzyl phthalate	<1.13	-	-	-	10
2-Chloronaphthalene	<0.46	-	-	-	10
4-Chlorophenyl phenyl ether	<1.08	-	-	-	10
Chrysene	<0.93	-	-	-	5
Dibenzo(a,h)anthracene	<1.13	-	-	-	5
1,2-Dichlorobenzene [o-Dichlorobenzene]	<0.67	-	-	-	10
1,3-Dichlorobenzene [m-Dichlorobenzene]	<0.87	-	-	-	10
1,4-Dichlorobenzene [p-Dichlorobenzene]	<0.41	-	-	-	10
3,3'-Dichlorobenzidine	<1.44	-	-	-	5
Diethyl phthalate	<1.03	-	-	-	10
Dimethyl phthalate	<1.18	-	-	-	10
Di-n-butyl phthalate	<2	-	-	-	10
2,4-Dinitrotoluene	<1.59	-	-	-	10
2,6-Dinitrotoluene	<2	-	-	-	10
Di-n-octyl phthalate	<4.53	-	-	-	10
1,2-Diphenylhydrazine (as Azobenzene)	<0.36	-	-	-	20
Fluoranthene	<0.72	-	-	-	10
Fluorene	<0.77	-	-	-	10
Hexachlorobenzene	<1.13	-	-	-	5
Hexachlorobutadiene	<0.67	-	-	-	10
Hexachlorocyclopentadiene	<2.26	-	-	-	10
Hexachloroethane	<0.77	-	-	-	20
Indeno(1,2,3-cd)pyrene	<0.36	-	-	-	5
Isophorone	<0.46	-	-	-	10
Naphthalene	<0.51	-	-	-	10
Nitrobenzene	<1.49	-	-	-	10
N-Nitrosodimethylamine	<1.3	-	-	-	50
N-Nitrosodi-n-propylamine	<1.18	-	-	-	20
N-Nitrosodiphenylamine	<0.77	-	-	-	20
Phenanthrene	<0.72	-	-	-	10
Pyrene	<0.93	-	-	-	10
1,2,4-Trichlorobenzene	<0.87	-	-	-	10

* Indicate units if different from µg/L.

Table 11 for Outfall No.: 003 : Pesticides
Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Aldrin	<0.003	-	-	-	0.01
alpha-BHC [alpha-Hexachlorocyclohexane]	<0.008	-	-	-	0.05
beta-BHC [beta-Hexachlorocyclohexane]	<0.01	-	-	-	0.05
gamma-BHC [gamma-Hexachlorocyclohexane]	<0.005	-	-	-	0.05
delta-BHC [delta-Hexachlorocyclohexane]	<0.004	-	-	-	0.05
Chlordane	<0.1	-	-	-	0.2
4,4'-DDT	<0.004	-	-	-	0.02
4,4'-DDE	<0.002	-	-	-	0.1
4,4'-DDD	<0.006	-	-	-	0.1
Dieldrin	<0.003	-	-	-	0.02
Endosulfan I (alpha)	<0.003	-	-	-	0.01
Endosulfan II (beta)	<0.004	-	-	-	0.02
Endosulfan sulfate	<0.003	-	-	-	0.1
Endrin	<0.004	-	-	-	0.02
Endrin aldehyde	<0.008	-	-	-	0.1
Heptachlor	<0.005	-	-	-	0.01
Heptachlor epoxide	<0.002	-	-	-	0.01
PCB 1242	<0.02	-	-	-	0.2
PCB 1254	<0.02	-	-	-	0.2
PCB 1221	<0.02	-	-	-	0.2
PCB 1232	<0.02	-	-	-	0.2
PCB 1248	<0.02	-	-	-	0.2
PCB 1260	<0.01	-	-	-	0.2
PCB 1016	<0.02	-	-	-	0.2
Toxaphene	<0.1	-	-	-	0.3

* Indicate units if different from µg/L.

Attachment: N/A

TABLE 12 (DIOXINS/FURAN COMPOUNDS)

Complete of Table 12 **is required** for **external outfalls**, as directed below. (Instructions, Pages 53-54)

1. Indicate which compound(s) are manufactured or used at the facility and provide a brief description of the conditions of its/their presence at the facility (check all that apply).

☐ 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) CASRN 93-76-5
☐ 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP) CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon) CASRN 136-25-4
☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel) CASRN 299-84-3
☐ 2,4,5-trichlorophenol (TCP) CASRN 95-95-4
☐ hexachlorophene (HCP) CASRN 70-30-4
☒ None of the above

Description: N/A

2. Does the applicant or anyone at the facility know or have any reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) or any congeners of TCDD may be present in the effluent proposed for discharge?

☐ Yes ☒ No

Description: N/A

If **yes** to either Items a **or** b, complete Table 12 as instructed.

Table 12 for Outfall No.: N/A
Samples are (check one): ☐ Composites ☐ Grabs

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDD	1					10
1,2,3,7,8-PeCDD	1.0					50
2,3,7,8-HxCDDs	0.1					50
1,2,3,4,6,7,8-HpCDD	0.01					50
2,3,7,8-TCDF	0.1					10
1,2,3,7,8-PeCDF	0.03					50
2,3,4,7,8-PeCDF	0.3					50
2,3,7,8-HxCDFs	0.1					50
2,3,4,7,8-HpCDFs	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					500
PCB 81	0.0003					500
PCB 126	0.1					500
PCB 169	0.03					500
Total						

TABLE 13 (HAZARDOUS SUBSTANCES)

Complete Table 13 **is required** for all **external outfalls** as directed below. (Instructions, Page 54)

1. Are there any pollutants listed in the instructions (pages 55-62) believed present in the discharge?

☒ Yes ☐ No

3. Are there pollutants listed in Item 1.c. of Technical Report 1.0 which are believed present in the discharge and have not been analytically quantified elsewhere in this application?

☐ Yes ☒ No

If **yes** to either Items a **or** b, complete Table 13 as instructed.

Table 13 for Outfall No.: 003

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
Vanadium	7440-62-2	6.1	-	-	-	EPA 200.8

WORKSHEET 2.0
POLLUTANT ANALYSES REQUIREMENTS

Worksheet 2.0 **is required** for all applications submitted for a TPDES permit. Worksheet 2.0 is not required for applications for a permit to dispose of all wastewater by land disposal or for discharges solely of stormwater associated with industrial activities.

i. LABORATORY ACCREDITATION (Instructions, Page 49)

Effective July 1, 2008, all laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification* with the following general exemptions:

a. The laboratory is an in-house laboratory and is:
   - periodically inspected by the TCEQ; or

1. located in another state and is accredited or inspected by that state; or
   i. performing work for another company with a unit located in the same site; or
   ii. performing pro bono work for a governmental agency or charitable organization.
1. The laboratory is accredited under federal law.
2. The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
3. The laboratory supplies data for which the TCEQ does not offer accreditation.

Review *30 TAC Chapter 25* for specific requirements. The following certification statement shall be signed and submitted with every application. See Instructions, Page 32, for a list of approved signatories.

I, (see certification on pg. 1 of Worksheet 2 for Outfall 001), certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*.

_____
(Signature)

1. GENERAL TESTING REQUIREMENTS (Instructions, Pages 49-51)

1. Provide the date range of all sampling events conducted to obtain the analytical data submitted with this application (e.g., 05/01/2018-05/30/2018): 10/09/2020

2. ☒ Check the box to confirm all samples were collected no more than 12 months prior to the date of application submittal.

3. Read the general testing requirements in the instructions for important information about sampling, test methods, and MALs. If a contact laboratory was used, attach a list which includes the name, contact information, and pollutants analyzed for each laboratory/firm. **Attachment:** T-3 Laboratories for Outfall Analyses

4. SPECIFIC TESTING REQUIREMENTS (Instructions, Pages 51-62)

Attach correspondence from TCEQ approving submittal of less than the required number of samples, if applicable. **Attachment:** Analyses for 1 sample are provided in this worksheet. Dry weather has delayed taking additional samples because the outfall discharge is primarily stormwater. Lyondell will be providing analyses for an additional 3 samples for Tables 1 and 2 and 1 sample for volatiles in Tables 3 and 8 and color/surfactants in Table 6 once these samples can be collected.

TABLE 1 and TABLE 2 (Instructions, Page 50)

Completion of Tables 1 and 2 **is required** for **all external outfalls** for all TPDES permit applications.

Table 1 for Outfall No.: 004

Samples are (check one): ☐ **Composite** ☒ **Grab**

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
BOD (5-day)	<2	-	-	-
CBOD (5-day)	<2	-	-	-
Chemical oxygen demand	14	-	-	-
Total organic carbon	-	-	-	-
Dissolved oxygen	8.01	-	-	-
Ammonia nitrogen	<0.25	-	-	-
Total suspended solids	11	-	-	-
Nitrate nitrogen	<0.5	-	-	-
Total organic nitrogen	0.89	-	-	-
Total phosphorus	0.06	-	-	-
Oil and grease	-	-	-	-
Total residual chlorine	0.03	-	-	-
Total dissolved solids	141	-	-	-
Sulfate	19.4	-	-	-
Chloride	<5	-	-	-
Fluoride	<0.5	-	-	-
Total alkalinity (mg/L as $CaCO_3$)	60	-	-	-
Temperature (°F)	74.3	-	-	-
pH (standard units)	8.6	-	-	-

Table 2 for Outfall No.: 004

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Aluminum, total	866	-	-	-	2.5
Antimony, total	<0.4	-	-	-	5
Arsenic, total	2	-	-	-	0.5
Barium, total	41.8	-	-	-	3
Beryllium, total	<0.4	-	-	-	0.5
Cadmium, total	<0.4	-	-	-	1

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Chromium, total	5.4	-	-	-	3
Chromium, hexavalent	<3.4	-	-	-	3
Chromium, trivalent	5.4	-	-	-	N/A
Copper, total	3.8	-	-	-	2
Cyanide, available	<1.49 [CN-avail] <0.785 [CN-free]	-	-	-	2/10
Lead, total	1.0	-	-	-	0.5
Mercury, total	0.004003	-	-	-	0.005/0.0005
Nickel, total	1.2	-	-	-	2
Selenium, total	<3.2	-	-	-	5
Silver, total	<0.4	-	-	-	0.5
Thallium, total	<0.4	-	-	-	0.5
Zinc, total	17.3	-	-	-	5.0

TABLE 3 (Instructions, Page 50)

Completion of Table 3 **is required** for all **external outfalls** which discharge process wastewater.

Partial completion of Table 3 **is required** for all **external outfalls** which discharge non-process wastewater and stormwater associated with industrial activities commingled with other wastestreams (see instructions for additional guidance).

Table 3 for Outfall No.: 004

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Acrylonitrile	-	-	-	-	50
Anthracene	<0.57	-	-	-	10
Benzene	-	-	-	-	10
Benzidine	<1.08	-	-	-	50
Benzo(a)anthracene	<0.62	-	-	-	5
Benzo(a)pyrene	<1.39	-	-	-	5
Bis(2-chloroethyl)ether	<1.18	-	-	-	10
Bis(2-ethylhexyl)phthalate	<3.61	-	-	-	10
Bromodichloromethane [Dichlorobromomethane]	-	-	-	-	10
Bromoform	-	-	-	-	10
Carbon tetrachloride	-	-	-	-	2
Chlorobenzene	-	-	-	-	10
Chlorodibromomethane [Dibromochloromethane]	-	-	-	-	10
Chloroform	-	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Chrysene	<0.93	-	-	-	5
m-Cresol [3-Methylphenol]	<6.56†	-	-	-	10
o-Cresol [2-Methylphenol]	<3.28	-	-	-	10
p-Cresol [4-Methylphenol]	<6.56†	-	-	-	10
1,2-Dibromoethane	-	-	-	-	10
m-Dichlorobenzene [1,3-Dichlorobenzene]	<0.87	-	-	-	10
o-Dichlorobenzene [1,2-Dichlorobenzene]	<0.67	-	-	-	10
p-Dichlorobenzene [1,4-Dichlorobenzene]	<0.41	-	-	-	10
3,3'-Dichlorobenzidine	<1.44	-	-	-	5
1,2-Dichloroethane	-	-	-	-	10
1,1-Dichloroethene [1,1-Dichloroethylene]	-	-	-	-	10
Dichloromethane [Methylene chloride]	-	-	-	-	20
1,2-Dichloropropane	-	-	-	-	10
1,3-Dichloropropene [1,3-Dichloropropylene]	-	-	-	-	10
2,4-Dimethylphenol	<0.87	-	-	-	10
Di-n-Butyl phthalate	<2	-	-	-	10
Ethylbenzene	-	-	-	-	10
Fluoride	<500	-	-	-	500
Hexachlorobenzene	<1.13	-	-	-	5
Hexachlorobutadiene	<0.67	-	-	-	10
Hexachlorocyclopentadiene	<2.26	-	-	-	10
Hexachloroethane	<0.77	-	-	-	20
Methyl ethyl ketone	-	-	-	-	50
Nitrobenzene	<1.49	-	-	-	10
N-Nitrosodiethylamine	<8.2	-	-	-	20
N-Nitroso-di-n-butylamine	<8.2	-	-	-	20
Nonylphenol	<2.09	-	-	-	333
Pentachlorobenzene	<4.92	-	-	-	20
Pentachlorophenol	<0.82	-	-	-	5
Phenanthrene	<0.72	-	-	-	10
Polychlorinated biphenyls (PCBs) (**)	<0.02	-	-	-	0.2
Pyridine	<0.57	-	-	-	20
1,2,4,5-Tetrachlorobenzene	<8.2	-	-	-	20
1,1,2,2-Tetrachloroethane	-	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Tetrachloroethene [Tetrachloroethylene]	-				10
Toluene	-				10
1,1,1-Trichloroethane	-				10
1,1,2-Trichloroethane	-				10
Trichloroethene [Trichloroethylene]	-				10
2,4,5-Trichlorophenol	<1.39				50
TTHM (Total trihalomethanes)	-				10
Vinyl chloride	-				10

(*) Indicate units if different from µg/L.

(**) Total of detects for PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016. If all non-detects, enter the highest non-detect preceded by a "<".

†Semivolatiles were analyzed by EPA Method 625.1. TCEQ does not offer accreditation for m-cresol by 625.1. Laboratory reported m+p-cresol as co-eluted. Laboratory's accreditation certificate does not include p-cresol by 625.1.

TABLE 4 (Instructions, Pages 50-51)

Partial completion of Table 4 **is required** for each **external outfall** based on the conditions below.

a. Tributyltin

Is this facility an industrial/commercial facility which currently or proposes to directly dispose of wastewater from the types of operations listed below or a domestic facility which currently or proposes to receive wastewater from the types of industrial/commercial operations listed below?

☐ Yes ☒ No

If **yes**, check the box next to each of the following criteria which apply and provide the appropriate testing results in Table 4 below (check all that apply).

☐ Manufacturers and formulators of tributyltin or related compounds.

☐ Painting of ships, boats and marine structures.

☐ Ship and boat building and repairing.

☐ Ship and boat cleaning, salvage, wrecking and scaling.

☐ Operation and maintenance of marine cargo handling facilities and marinas.

☐ Facilities engaged in wood preserving.

☐ Any other industrial/commercial facility for which tributyltin is known to be present, or for which there is any reason to believe that tributyltin may be present in the effluent.

b. Enterococci (discharge to saltwater)

iii. This facility discharges/proposes to discharge directly into saltwater receiving waters **and** Enterococci bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

1. Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

c. E. coli (discharge to freshwater)

ii. This facility discharges/proposes to discharge directly into freshwater receiving waters **and** *E. coli* bacteria are expected to be present in the discharge based on facility processes.

☐ Yes ☒ No

1. Domestic wastewater is/will be discharged.

☐ Yes ☒ No

If **yes to either** question, provide the appropriate testing results in Table 4 below.

Table 4 for Outfall No.: N/A

Samples are (check one): ☐ **Composites** ☐ **Grabs**

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Tributyltin (µg/L)					0.010

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Enterococci (cfu or MPN/100 mL)					N/A
E. coli (cfu or MPN/100 mL)					N/A

TABLE 5 (Instructions, Page 51)

Completion of Table 5 **is required** for all **external outfalls** which discharge process wastewater from a facility which manufactures or formulates pesticides or herbicides or other wastewaters which may contain pesticides or herbicides.

If this facility does not/will not manufacture or formulate pesticides or herbicides and does not/will not discharge other wastewaters which may contain pesticides or herbicides, check N/A.

☒ N/A

Table 5 for Outfall No.: N/A
Samples are (check one): ☐ **Composites** ☐ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Aldrin					0.01
Carbaryl					5
Chlordane					0.2
Chlorpyrifos					0.05
4,4'-DDD					0.1
4,4'-DDE					0.1
4,4'-DDT					0.02
2,4-D					0.7
Danitol [Fenpropathrin]					—
Demeton					0.20
Diazinon					0.5/0.1
Dicofol [Kelthane]					1
Dieldrin					0.02
Diuron					0.090
Endosulfan I (*alpha*)					0.01
Endosulfan II (*beta*)					0.02
Endosulfan sulfate					0.1
Endrin					0.02
Guthion [Azinphos methyl]					0.1
Heptachlor					0.01
Heptachlor epoxide					0.01
Hexachlorocyclohexane (*alpha*)					0.05
Hexachlorocyclohexane (*beta*)					0.05
Hexachlorocyclohexane (*gamma*) [Lindane]					0.05
Hexachlorophene					10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Malathion					0.1
Methoxychlor					2.0
Mirex					0.02
Parathion (ethyl)					0.1
Toxaphene					0.3
2,4,5-TP [Silvex]					0.3

* Indicate units if different from µg/L.

TABLE 6 (Instructions, Page 52)

Completion of Table 6 **is required** for all **external outfalls**.

Table 6 for Outfall No.: 004
Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutants	Believed Present	Believed Absent	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)	MAL (µg/L)*
Bromide	☐	☒	<0.5	-	-	-	400
Color (PCU)	☒	☐	-	-	-	-	—
Nitrate-Nitrite (as N)	☐	☒	<0.5	-	-	-	—
Sulfide (as S)	☐	☒	<0.05	-	-	-	—
Sulfite (as SO_3)	☐	☒	<1	-	-	-	—
Surfactants	☒	☐	-	-	-	-	—
Boron, total	☒	☐	0.026	-	-	-	20
Cobalt, total	☒	☐	0.0002	-	-	-	0.3
Iron, total	☒	☐	0.54	-	-	-	7
Magnesium, total	☒	☐	1.43	-	-	-	20
Manganese, total	☒	☐	0.0137	-	-	-	0.5
Molybdenum, total	☒	☐	0.0027	-	-	-	1
Tin, total	☐	☒	<0.004	-	-	-	5
Titanium, total	☒	☐	0.0265	-	-	-	30

* Indicate units if different from µg/L.

TABLE 7 (Instructions, Page 52)

Check the box next to any of the industrial categories applicable to this facility. If no categories are applicable, check N/A. If GC/MS testing is required, check the box provided to confirm the testing results for the appropriate parameters are provided with the application.

☒ N/A

Table 7 for Applicable Industrial Categories

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
☐ Adhesives and Sealants		☐ Yes	☐ Yes	☐ Yes	No
☐ Aluminum Forming	467	☐ Yes	☐ Yes	☐ Yes	No
☐ Auto and Other Laundries		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Battery Manufacturing	461	☐ Yes	No	☐ Yes	No
☐ Coal Mining	434	No	No	No	No
☐ Coil Coating	465	☐ Yes	☐ Yes	☐ Yes	No
☐ Copper Forming	468	☐ Yes	☐ Yes	☐ Yes	No
☐ Electric and Electronic Components	469	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Electroplating	413	☐ Yes	☐ Yes	☐ Yes	No
☐ Explosives Manufacturing	457	No	☐ Yes	☐ Yes	No
☐ Foundries		☐ Yes	☐ Yes	☐ Yes	No
☐ Gum and Wood Chemicals - Subparts A,B,C,E	454	☐ Yes	☐ Yes	No	No
☐ Gum and Wood Chemicals - Subparts D,F	454	☐ Yes	☐ Yes	☐ Yes	No
☐ Inorganic Chemicals Manufacturing	415	☐ Yes	☐ Yes	☐ Yes	No
☐ Iron and Steel Manufacturing	420	☐ Yes	☐ Yes	☐ Yes	No
☐ Leather Tanning and Finishing	425	☐ Yes	☐ Yes	☐ Yes	No
☐ Mechanical Products Manufacturing		☐ Yes	☐ Yes	☐ Yes	No
☐ Nonferrous Metals Manufacturing	421,471	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Ore Mining - Subpart B	440	No	☐ Yes	No	No
☐ Organic Chemicals Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Paint and Ink Formulation	446,447	☐ Yes	☐ Yes	☐ Yes	No
☐ Pesticides	455	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Petroleum Refining	419	☐ Yes	No	No	No
☐ Pharmaceutical Preparations	439	☐ Yes	☐ Yes	☐ Yes	No
☐ Photographic Equipment and Supplies	459	☐ Yes	☐ Yes	☐ Yes	No
☐ Plastic and Synthetic Materials Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Plastic Processing	463	☐ Yes	No	No	No
☐ Porcelain Enameling	466	No	No	No	No
☐ Printing and Publishing		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Pulp and Paperboard Mills - Subpart C	430	☐ *	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subparts F, K	430	☐ *	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts A, B, D, G, H	430	☐ Yes	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts I, J, L	430	☐ Yes	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subpart E	430	☐ Yes	☐ Yes	☐ Yes	☐ *
☐ Rubber Processing	428	☐ Yes	☐ Yes	☐ Yes	No
☐ Soap and Detergent Manufacturing	417	☐ Yes	☐ Yes	☐ Yes	No
☐ Steam Electric Power Plants	423	☐ Yes	☐ Yes	No	No

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/Neutrals Table 10	Pesticides Table 11
☐ Textile Mills (Not Subpart C)	410	☐ Yes	☐ Yes	☐ Yes	No
☐ Timber Products Processing	429	☐ Yes	☐ Yes	☐ Yes	☐ Yes

* Test if believed present.

TABLES 8, 9, 10, and 11 (Instructions, Page 52)

Completion of Tables 8, 9, 10, and 11 **is required** as specified in Table 7 for all **external outfalls** that contain process wastewater.

Completion of Tables 8, 9, 10, and 11 **may be required** for types of industry not specified in Table 7 for specific parameters that are believed to be present in the wastewater.

Table 8 for Outfall No.: 004 : Volatile Compounds
Samples are (check one): ☐ Composites ☐ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acrolein	-	-	-	-	50
Acrylonitrile	-	-	-	-	50
Benzene	-	-	-	-	10
Bromoform	-	-	-	-	10
Carbon tetrachloride	-	-	-	-	2
Chlorobenzene	-	-	-	-	10
Chlorodibromomethane	-	-	-	-	10
Chloroethane	-	-	-	-	50
2-Chloroethylvinyl ether	-	-	-	-	10
Chloroform	-	-	-	-	10
Dichlorobromomethane [Bromodichloromethane]	-	-	-	-	10
1,1-Dichloroethane	-	-	-	-	10
1,2-Dichloroethane	-	-	-	-	10
1,1-Dichloroethylene [1,1-Dichloroethene]	-	-	-	-	10
1,2-Dichloropropane	-	-	-	-	10
1,3-Dichloropropylene [1,3-Dichloropropene]	-	-	-	-	10
Ethylbenzene	-	-	-	-	10
Methyl bromide [Bromomethane]	-	-	-	-	50
Methyl chloride [Chloromethane]	-	-	-	-	50
Methylene chloride [Dichloromethane]	-	-	-	-	20
1,1,2,2-Tetrachloroethane	-	-	-	-	10
Tetrachloroethylene [Tetrachloroethene]	-	-	-	-	10
Toluene	-	-	-	-	10
1,2-Trans-dichloroethylene [1,2-Trans-dichloroethene]	-	-	-	-	10
1,1,1-Trichloroethane	-	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
1,1,2-Trichloroethane	-	-	-	-	10
Trichloroethylene [Trichloroethene]	-	-	-	-	10
Vinyl chloride	-	-	-	-	10

* Indicate units if different from µg/L.

Table 9 for Outfall No.: 004 : Acid Compounds
Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
2-Chlorophenol	<0.82	-	-	-	10
2,4-Dichlorophenol	<1.13	-	-	-	10
2,4-Dimethylphenol	<0.87	-	-	-	10
4,6-Dinitro-o-cresol	<1.08	-	-	-	50
2,4-Dinitrophenol	<2.31	-	-	-	50
2-Nitrophenol	<1.44	-	-	-	20
4-Nitrophenol	<1.85	-	-	-	50
p-Chloro-m-cresol	<0.87	-	-	-	10
Pentachlorophenol	<0.82	-	-	-	5
Phenol	<0.72	-	-	-	10
2,4,6-Trichlorophenol	<1.3	-	-	-	10

* Indicate units if different from µg/L.

Table 10 for Outfall No.: 004 : Base/Neutral Compounds
Samples are (check one): ☐ Composites ☒ Grabs

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Acenaphthene	<0.46	-	-	-	10
Acenaphthylene	<0.77	-	-	-	10
Anthracene	<0.57	-	-	-	10
Benzidine	<1.08	-	-	-	50
Benzo(a)anthracene	<0.62	-	-	-	5
Benzo(a)pyrene	<1.39	-	-	-	5
3,4-Benzofluoranthene [Benzo(b)fluoranthene]	<0.93	-	-	-	10
Benzo(ghi)perylene	<1.03	-	-	-	20
Benzo(k)fluoranthene	<0.93	-	-	-	5
Bis(2-chloroethoxy)methane	<0.57	-	-	-	10
Bis(2-chloroethyl)ether	<1.18	-	-	-	10
Bis(2-chloroisopropyl)ether	<1.39	-	-	-	10
Bis(2-ethylhexyl)phthalate	<3.61	-	-	-	10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
4-Bromophenyl phenyl ether	<0.67	-	-	-	10
Butylbenzyl phthalate	<1.13	-	-	-	10
2-Chloronaphthalene	<0.46	-	-	-	10
4-Chlorophenyl phenyl ether	<1.08	-	-	-	10
Chrysene	<0.93	-	-	-	5
Dibenzo(a,h)anthracene	<1.13	-	-	-	5
1,2-Dichlorobenzene [o-Dichlorobenzene]	<0.67	-	-	-	10
1,3-Dichlorobenzene [m-Dichlorobenzene]	<0.87	-	-	-	10
1,4-Dichlorobenzene [p-Dichlorobenzene]	<0.41	-	-	-	10
3,3'-Dichlorobenzidine	<1.44	-	-	-	5
Diethyl phthalate	<1.03	-	-	-	10
Dimethyl phthalate	<1.18	-	-	-	10
Di-n-butyl phthalate	<2	-	-	-	10
2,4-Dinitrotoluene	<1.59	-	-	-	10
2,6-Dinitrotoluene	<2	-	-	-	10
Di-n-octyl phthalate	<4.53	-	-	-	10
1,2-Diphenylhydrazine (as Azobenzene)	<0.36	-	-	-	20
Fluoranthene	<0.72	-	-	-	10
Fluorene	<0.77	-	-	-	10
Hexachlorobenzene	<1.13	-	-	-	5
Hexachlorobutadiene	<0.67	-	-	-	10
Hexachlorocyclopentadiene	<2.26	-	-	-	10
Hexachloroethane	<0.77	-	-	-	20
Indeno(1,2,3-cd)pyrene	<0.36	-	-	-	5
Isophorone	<0.46	-	-	-	10
Naphthalene	<0.51	-	-	-	10
Nitrobenzene	<1.49	-	-	-	10
N-Nitrosodimethylamine	<1.3	-	-	-	50
N-Nitrosodi-n-propylamine	<1.18	-	-	-	20
N-Nitrosodiphenylamine	<0.77	-	-	-	20
Phenanthrene	<0.72	-	-	-	10
Pyrene	<0.93	-	-	-	10
1,2,4-Trichlorobenzene	<0.87	-	-	-	10

* Indicate units if different from µg/L.

Table 11 for Outfall No.: 004 : Pesticides
Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Aldrin	<0.003	-	-	-	0.01
alpha-BHC [alpha-Hexachlorocyclohexane]	<0.008	-	-	-	0.05
beta-BHC [beta-Hexachlorocyclohexane]	<0.01	-	-	-	0.05
gamma-BHC [gamma-Hexachlorocyclohexane]	<0.005	-	-	-	0.05
delta-BHC [delta-Hexachlorocyclohexane]	<0.004	-	-	-	0.05
Chlordane	<0.1	-	-	-	0.2
4,4'-DDT	<0.004	-	-	-	0.02
4,4'-DDE	<0.002	-	-	-	0.1
4,4'-DDD	<0.006	-	-	-	0.1
Dieldrin	<0.003	-	-	-	0.02
Endosulfan I (alpha)	<0.003	-	-	-	0.01
Endosulfan II (beta)	<0.004	-	-	-	0.02
Endosulfan sulfate	<0.003	-	-	-	0.1
Endrin	<0.004	-	-	-	0.02
Endrin aldehyde	<0.008	-	-	-	0.1
Heptachlor	<0.005	-	-	-	0.01
Heptachlor epoxide	<0.002	-	-	-	0.01
PCB 1242	<0.02	-	-	-	0.2
PCB 1254	<0.02	-	-	-	0.2
PCB 1221	<0.02	-	-	-	0.2
PCB 1232	<0.02	-	-	-	0.2
PCB 1248	<0.02	-	-	-	0.2
PCB 1260	<0.02	-	-	-	0.2
PCB 1016	<0.02	-	-	-	0.2
Toxaphene	<0.1	-	-	-	0.3

* Indicate units if different from µg/L.

Attachment: N/A

TABLE 12 (DIOXINS/FURAN COMPOUNDS)

Complete of Table 12 **is required** for **external outfalls**, as directed below. (Instructions, Pages 53-54)

1. Indicate which compound(s) are manufactured or used at the facility and provide a brief description of the conditions of its/their presence at the facility (check all that apply).

☐ 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) CASRN 93-76-5
☐ 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP) CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon) CASRN 136-25-4
☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel) CASRN 299-84-3
☐ 2,4,5-trichlorophenol (TCP) CASRN 95-95-4
☐ hexachlorophene (HCP) CASRN 70-30-4
☒ None of the above

Description: N/A

2. Does the applicant or anyone at the facility know or have any reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) or any congeners of TCDD may be present in the effluent proposed for discharge?

☐ Yes ☒ No

Description: N/A

If **yes** to either Items a **or** b, complete Table 12 as instructed.

Table 12 for Outfall No.: N/A
Samples are (check one): ☐ Composites ☐ Grabs

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDD	1					10
1,2,3,7,8-PeCDD	1.0					50
2,3,7,8-HxCDDs	0.1					50
1,2,3,4,6,7,8-HpCDD	0.01					50
2,3,7,8-TCDF	0.1					10
1,2,3,7,8-PeCDF	0.03					50
2,3,4,7,8-PeCDF	0.3					50
2,3,7,8-HxCDFs	0.1					50
2,3,4,7,8-HpCDFs	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					500
PCB 81	0.0003					500
PCB 126	0.1					500
PCB 169	0.03					500
Total						

TABLE 13 (HAZARDOUS SUBSTANCES)

Complete Table 13 **is required** for all **external outfalls** as directed below. (Instructions, Page 54)

1. Are there any pollutants listed in the instructions (pages 55-62) believed present in the discharge?

☒ Yes ☐ No

3. Are there pollutants listed in Item 1.c. of Technical Report 1.0 which are believed present in the discharge and have not been analytically quantified elsewhere in this application?

☐ Yes ☒ No

If **yes** to either Items a **or** b, complete Table 13 as instructed.

Table 13 for Outfall No.: 004

Samples are (check one): ☐ **Composites** ☒ **Grabs**

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
Vanadium	7440-62-2	4.1	-	-	-	EPA 200.8

WORKSHEET 4.0
RECEIVING WATERS

This worksheet **is required** for all TPDES permit applications.

1. DOMESTIC DRINKING WATER SUPPLY (Instructions, Page 74)

a. There is a surface water intake for domestic drinking water supply located within 5 (five) miles downstream from the point/proposed point of discharge.

☐ Yes ☒ No

If **no**, stop here and proceed to Item 2. If **yes**, provide the following information:

i. The legal name of the owner of the drinking water supply intake: N/A

v. The distance and direction from the outfall to the drinking water supply intake: N/A

b. Locate and identify the intake on the USGS 7.5-minute topographic map provided for Administrative Report 1.0.

☐ Check this box to confirm the above requested information is provided.

2. DISCHARGE INTO TIDALLY INFLUENCED WATERS (Instructions, Page 74)

If the discharge is to tidally influenced waters, complete this section. Otherwise, proceed to Item 3.

a. Width of the receiving water at the outfall: N/A feet

b. Are there oyster reefs in the vicinity of the discharge?

☐ Yes ☐ No

If **yes**, provide the distance and direction from the outfall(s) to the oyster reefs: N/A

c. Are there sea grasses within the vicinity of the point of discharge?

☐ Yes ☐ No

If **yes**, provide the distance and direction from the outfall(s) to the grasses: N/A

3. CLASSIFIED SEGMENT (Instructions, Page 74)

The discharge is/will be directly into (or within 300 feet of) a classified segment.

☐ Yes ☒ No

If **yes**, stop here. It is not necessary to complete Items 4 and 5 of this worksheet or Worksheet 4.1.

If **no**, complete Items 4 and 5 and Worksheet 4.1 may be required.

4. DESCRIPTION OF IMMEDIATE RECEIVING WATERS (Instructions, Page 75)

a. Name of the immediate receiving waters: Outfalls 001-008: HCFCD ditch G103-02-03; Outfall 009: unnamed ditch; Outfall 010: unnamed ditch along Wallisville Road

b. Check the appropriate description of the immediate receiving waters:

☐ Lake or Pond
- Surface area (acres): Click to enter text.
- Average depth of the entire water body (feet): Click to enter text.
- Average depth of water body within a 500-foot radius of the discharge point (feet): Click to enter text.

☒ Man-Made Channel or Ditch
☐ Stream or Creek
☐ Freshwater Swamp or Marsh
☐ Tidal Stream, Bayou, or Marsh
☐ Open Bay
☐ Other, specify: Click to enter text.

If **Man-Made Channel or Ditch** or **Stream or Creek** were selected above, provide responses to Items 4.c – 4.g below:

c. For **existing discharges**, check the description below that best characterizes the area **upstream** of the discharge.

For **new discharges**, check the description below that best characterizes the area **downstream** of the discharge.

☒ Intermittent (dry for at least one week during most years)
☐ Intermittent with Perennial Pools (enduring pools containing habitat to maintain aquatic life uses)
☐ Perennial (normally flowing)

Check the source(s) of the information used to characterize the area upstream (existing discharge) or downstream (new discharge):

☐ USGS flow records
☐ personal observation
☐ historical observation by adjacent landowner(s)
☒ other, specify: 2016 TCEQ TPDES Fact Sheet

d. List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point: Bear Lake, part of the San Jacinto River Tidal, thence to San Jacinto River Tidal in Segment No. 1001 of the San Jacinto River Basin

e. The receiving water characteristics change within three miles downstream of the discharge (e.g., natural or man-made dams, ponds, reservoirs, etc.).

☒ Yes ☐ No

If **yes**, describe how: The relatively narrow drainage ditches flow into the much wider Bear Lake and San Jacinto River Tidal.

f. General observations of the water body during normal dry weather conditions: Outfalls 001 and 002 (11/5/20 10:50 AM) – flowing; Outfall 003 (11/5/20 11:10 AM) – dry; Outfall 004 (11/5/20 12:00) – standing water behind weir, but no discharge; Outfall 005 (11/5/20 12:05 PM) – dry; Outfall 006 (11/5/20 12:10 PM) – dry.

Date and time of observation: (see above)

g. The water body was influenced by stormwater runoff during observations.

☐ Yes ☒ No

If **yes**, describe how: N/A

5. GENERAL CHARACTERISTICS OF WATER BODY (Instructions, Page 75)

a. Is the receiving water upstream of the existing discharge or proposed discharge site influenced by any of the following (check all that apply):

☐ oil field activities
☒ urban runoff
☐ agricultural runoff
☐ septic tanks
☐ upstream discharges
☐ other, specify: Click to enter text.

b. Uses of water body observed or evidence of such uses (check all that apply):

☐ livestock watering
☐ fishing
☐ picnic/park activities
☐ non-contact recreation
☐ industrial water supply
☒ other, specify: stormwater drainage
☐ domestic water supply
☐ irrigation withdrawal
☐ contact recreation
☐ navigation

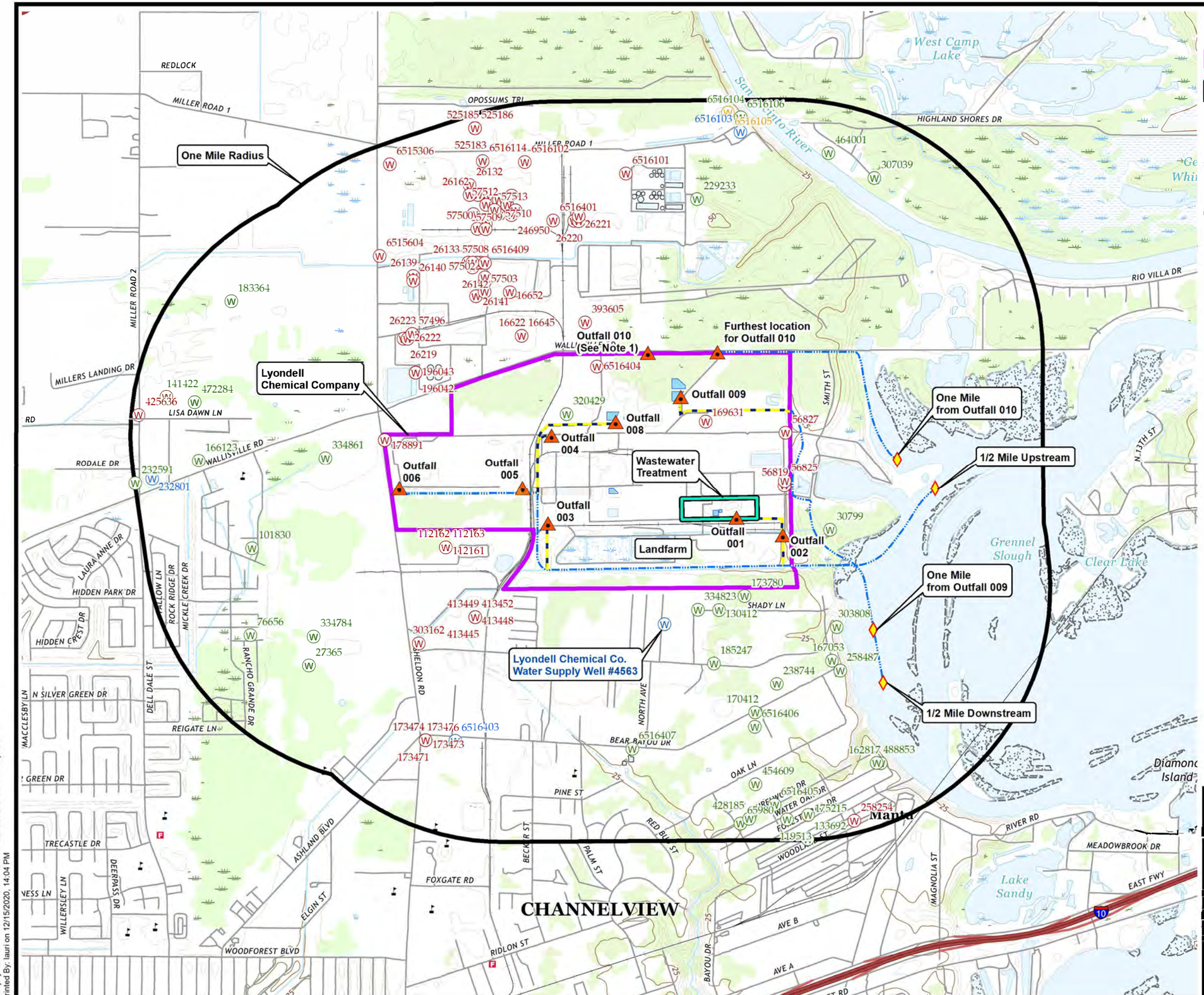
c. Description which best describes the aesthetics of the receiving water and the surrounding area (check only one):

☐ **Wilderness:** outstanding natural beauty; usually wooded or un-pastured area: water clarity exceptional

☐ **Natural Area:** trees or native vegetation common; some development evident (from fields, pastures, dwellings); water clarity discolored

☒ **Common Setting:** not offensive, developed but uncluttered; water may be colored or turbid

☐ **Offensive:** stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored



Legend

- Facility Boundary, Lyondell Chemical Company Channelview
- Wastewater Treatment
- Outfall Location
- Facility Ditches / Pipes
- Receiving Waters
- Upstream / Downstream Markers
- One Mile Radius

TWDB Wells

- Domestic
- Industrial/Monitor
- Irrigation
- Public Supply

Note:
1. Initial proposed location for Outfall 010. Outfall 010 is not constructed yet and could be moved further east and a one-mile distance past this point is indicated.

SOURCE: USGS TOPOGRAPHIC QUADRANGLES 7.5 MINUTE SERIES: HIGHLANDS, TX 2019, JACINTO CITY, TX 2019

0 1,000 2,000
FEET
1:24,000

LYONDELL CHEMICAL COMPANY
CHANNELVIEW SOUTH COMPLEX
CHANNELVIEW, TEXAS

ATTACHMENT SPIF-1
USGS MAP

DRAWN BY: L WILSON	SCALE:	PROJ. NO.	TPDES 2020
CHECKED BY: D KOCUREK	AS NOTED	FILE NO.	SP-USGS Map.mxd
APPROVED BY:	DATE PRINTED:		
DATE: December 2020	12/15/2020		

sitemap your mapping professional
www.SiteMapLLC.com
Ph. 409-998-1834
Ph. 409-738-2133

J:\Prj\Lyondell\Channelview\South Plant\TPDES 2020\SP-USGS Map.mxd
Printed By: lauri on 12/15/2020, 14:04 PM

ATTACHMENT A-1
TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☐ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☒ Renewal (*Core Data Form should be submitted with the renewal form*) ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number *(if issued)*
CN 600344402		RN 100633650

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy) 12/10/2020

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership

☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name (*If an individual, print last name first: eg: Doe, John*) *If new Customer, enter previous Customer below:*

Lyondell Chemical Company

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*
0006763606	19541605580		19-412-3154

11. Type of Customer: ☒ Corporation ☐ Individual Partnership: ☐ General ☐ Limited

Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher

13. Independently Owned and Operated?
☐ **Yes** ☒ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following:*

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:

P.O. Box 777

City	State	ZIP	ZIP + 4
Channelview	TX	77530	

16. Country Mailing Information (*if outside USA*) | **17. E-Mail Address** (*if applicable*)

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(281) 862-5026		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (*If 'New Regulated Entity" is selected below this form should be accompanied by a permit application*)

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC.)

22. Regulated Entity Name (*Enter name of the site where the regulated action is taking place.*)

Lyondell Chemical Channelview

23. Street Address of the Regulated Entity: *(No PO Boxes)*	2502 Sheldon Road							
	City	Channelview	State	TX	ZIP	77530	ZIP + 4	2681
24. County								

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:					
26. Nearest City			State	Nearest ZIP Code	
Channelview			TX	77530	
27. Latitude (N) In Decimal:	29.819444		28. Longitude (W) In Decimal:	-95.113888	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	49	10.00	-95	06	50.00

29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)	31. Primary NAICS Code (5 or 6 digits)	32. Secondary NAICS Code (5 or 6 digits)
2869	2865	325199	325192

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Industrial organic chemical manufacturing

34. Mailing Address:	P.O. Box 777							
	City	Channelview	State	TX	ZIP	77530	ZIP + 4	
35. E-Mail Address:								

36. Telephone Number	37. Extension or Code	38. Fax Number *(if applicable)*
(281) 862-5026		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☒ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:
	WQ0002927000			

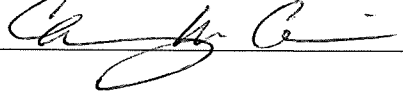
SECTION IV: Preparer Information

40. Name:	Nancy Ross	41. Title:	Senior Environmental Engineer

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(281) 452-8722		( ) -	Nancy.Ross@lyondellbasell.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Lyondell Chemical Company	Job Title:	Site Manager
Name *(In Print)* :	Christopher M. Cain	Phone:	(281) 862-5026
Signature:		Date:	12/17/2020

ATTACHMENT A-2

lyondellbasell

DATE: March 4, 2019

FROM: Michael D. VanDerSnick – Sr. Vice President, Americas Manufacturing

TO: Site Managers of Equistar Chemicals, LP; Lyondell Chemical Company; LyondellBasell Acetyls LLC; and Houston Refining

SUBJECT: **Delegation of Signatory Authority for Permit Applications and Other Similar Documents**

Pursuant to certain portions of the Standing Resolutions Adopted by: Equistar Chemicals, LP (Equistar); Lyondell Chemical Company (Lyondell); LyondellBasell Acetyls LLC (Acetyls); and Houston Refining LP (Refining), I am authorizing all Site Managers to sign and deliver on behalf of the individual plants and on behalf of Equistar, Lyondell, Acetyls and Refining all permit applications and other similar documents in conformity with the laws and regulations of environmental control agencies of any local, state or federal government body. This authorization includes the following sites:

EQUISTAR CHEMICALS, LP	*Current Site Manager*
Bayport, TX	Stephen G. Goff
Channelview, TX	Kimberly A. Foley
Chocolate Bayou, TX	Yarelis Hernandez
Clinton, IA	James R. Hillier
Corpus Christi, TX	Alicia R. Matus
Edison, NJ	Antero Ortega-Velazco
Equistar Pipelines	Scot C. McClure
Fairport Harbor, OH	Thaddeus S. Cudak
Jackson, TN	Rebecca L. White
Lake Charles, LA	Gregory Gray

EQUISTAR CHEMICALS, LP	*Current Site Manager*
LaPorte, TX	Christopher M. Cain
Mansfield, TX	James H. Meas
Markham, TX	Scot C. McClure
Matagorda, TX	Anthony Wood
Mont Belvieu	Scot C. McClure
Morris, IL	Randy Tatum
Newark, NJ	Terry E. Mallory
Tuscola, IL	Aaron J. McKee
Victoria, TX	Anthony Wood

LYONDELLBASELL ACETYLS, LLC	*Current Site Manager*
LaPorte, TX	Christopher M. Cain

LYONDELL CHEMICAL CO.	*Current Site Manager*
Bayport, TX	Stephen G. Goff
Channelview, TX	Kimberly A. Foley
Lake Charles, LA	Gregory Gray

HOUSTON REFINING LP	*Current Site Manager*
Houston, TX	Greg Nevermann

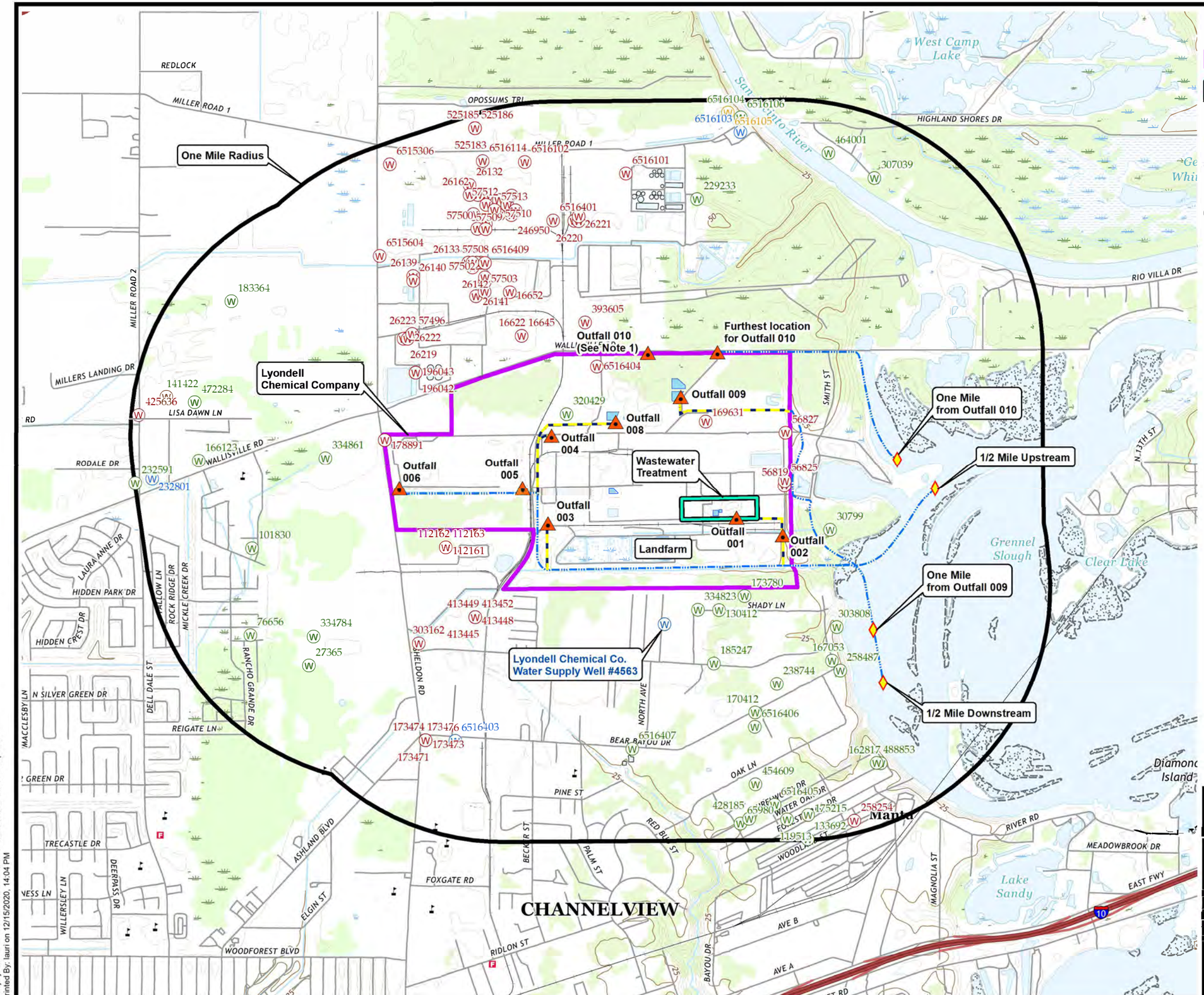
This authorization will apply to each manager's successor unless specifically revoked.

Each manager must assure that the information in these documents is accurate and truthful and in compliance with all applicable government regulations. If you have any questions, please seek assistance from the Legal Department.

If you have any questions, please feel free to contact me at 713-309-3809.

Michael D. VanDerSnick

cc: Jeffrey Kaplan – Chief Legal Officer
AJ Wissinger – Counsel, Global HSES
Julie Solmer Stine – Lead Counsel, HSES



Legend

- Facility Boundary, Lyondell Chemical Company Channelview
- Wastewater Treatment
- Outfall Location
- Facility Ditches / Pipes
- Receiving Waters
- Upstream / Downstream Markers
- One Mile Radius

TWDB Wells

- Domestic
- Industrial/Monitor
- Irrigation
- Public Supply

Note:
1. Initial proposed location for Outfall 010. Outfall 010 is not constructed yet and could be moved further east and a one-mile distance past this point is indicated.

SOURCE: USGS TOPOGRAPHIC QUADRANGLES 7.5 MINUTE SERIES: HIGHLANDS, TX 2019, JACINTO CITY, TX 2019

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0 1,000 2,000
FEET
1:24,000

LYONDELL CHEMICAL COMPANY
CHANNELVIEW SOUTH COMPLEX
CHANNELVIEW, TEXAS

ATTACHMENT A-3
USGS MAP

DRAWN BY: L WILSON	SCALE:	PROJ. NO.	TPDES 2020
CHECKED BY: D KOCUREK	AS NOTED	FILE NO.	SP-USGS Map.mxd
APPROVED BY:	DATE PRINTED:		
DATE: December 2020	12/15/2020		

sitemap your mapping professional
www.SiteMapLLC.com
Ph. 409-998-1834
Ph. 409-738-2133

J:\Prj\Lyondell\Channelview\South Plant\TPDES 2020\SP-USGS Map.mxd
Printed By: lauri on 12/15/2020, 14:04 PM

Legend

- 🟩 Property owned by Lyondell Chemical Company or Equistar Chemicals LP. Both companies are owned by LyondellBasell Industries, Inc
- ▭ Facility Boundary, Lyondell Chemical Company Channelview
- 🟪 Adjacent Landowners
- 🟦 Ponds
- ▭ Wastewater Treatment
- ▲ Outfall Location
- Facility Ditches / Pipes
- Receiving Waters
- ◆ Upstream / Downstream Markers
- ◯ One Mile Radius

Parcel Source: Harris County Appraisal District

Note:
1. Initial proposed location for Outfall 010. Outfall 010 is not constructed yet and could be moved further east and a one-mile distance past this point is indicated.

LYONDELL CHEMICAL COMPANY
CHANNELVIEW SOUTH COMPLEX
CHANNELVIEW, TEXAS

ATTACHMENT A-4-1
ADJACENT LANDOWNER MAP

DRAWN BY: L WILSON	SCALE:	PROJ. NO.	TPDES 2020
CHECKED BY: D KOCUREK	AS NOTED	SP-Full size Adjacent Landowner.mxd	
APPROVED BY:	DATE PRINTED:		
DATE: December 2020	Date: 12/16/2020		

sitemap your mapping professional
www.SiteMapLLC.com
Ph. 409-998-1834
Ph. 409-738-2133

J:\Pr\Lyondell\ChannelView\South Plant\TPDES 2020\SP-Full size Adjacent Landowner.mxd
Printed By: lauri on 12/16/2020, 12:10 PM

ATTACHMENT A-4-2 Landowner List
Lyondell Channelview South Plant
WQ0002927000

MAP ID	CURRENT OWNER	ADDRESS	CITY	STATE	ZIP CODE
1	ABEJA MOBILE HOMES LLC	PO BOX 271564	HOUSTON	TX	77277-1564
2	ADLOY LLC	623 W TEXAS AVE	BAYTOWN	TX	77520-4755
3	AGUINAGA LUIS	2102 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049
4	AICHLMAYR RICKY W & PENNY % RICKY AICHMAYR	22406 CORIANDER DR	KATY	TX	77450-1520
5	AIR LIQUIDE AMERICA CORP PROPERTY TAX DEPARTMENT	9811 KATY FREEWAY STE 100	HOUSTON	TX	77024-1274
6	ALBIN E	3427 VINEYARD DR	HOUSTON	TX	77082-1325
7	APACHE GLOBAL PAINTING INC	PO BOX 670369	HOUSTON	TX	77267-0369
8	ASKEW INVESTMENTS PROPERTIES SERIES LLC	PO BOX 459	CHANNELVIEW	TX	77530-0459
9	ATS SPECIALIZED INC	PO BOX 1377	SAINT CLOUD	MN	56302-1377
10	B D DEV	PO BOX 8450	HOUSTON	TX	77288-8450
11	B H KELLEY	ADDRESS UNKNOWN		TX	
12	BACHARELIS CESAR A	15536 AVENUE C	CHANNELVIEW	TX	77530-4024
13	BADILLO BENJAMIN JR	2142 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
14	BALKE THOMAS E & MARY RENEE	18803 WALLISVILLE RD	HOUSTON	TX	77049-5036
15	BAYTOWN BOAT CLUB	PO BOX 285	HIGHLANDS	TX	77562-0285
16	BEASLEY DAVID H & KRISTIN E	1612 PARK DR	CHANNELVIEW	TX	77530-2720
17	BERNAL ANA L	16015 KELLI ST	CHANNELVIEW	TX	77530-2709
18	BLANCHARD ELIZABETH	797 FM 1005	JASPER	TX	75951-6907
19	CABANISS ROBERT & CANDY F	16602 SHADY LN	CHANNELVIEW	TX	77530-2760
20	CALVIN C C	ADDRESS UNKNOWN	HOUSTON	TX	77059
21	CAMO CHEMICAL PROPERTIES LLC	16950 WALLISVILLE RD	HOUSTON	TX	77049-5014
22	CARDEN KENNETH D	1620 PARK DR	CHANNELVIEW	TX	77530-2720
23	CARL & LOS MITTEN FAMILY	2501 MUSEUM WAY APT 717	FORT WORTH	TX	76107-8006
24	CAROLYN C TAUB INTERESTS II LLC	PO BOX 27423	HOUSTON	TX	77227-7423
25	CASTILLO JOSE I & NOHELIA	16226 MILLERS LANDING LN	HOUSTON	TX	77049-4842
26	CAVAZOS ABEL PEDRO	2160 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049
27	CENTERPOINT ENERGY HOU ELE	PO BOX 1475	HOUSTON	TX	77251-1475
28	HARRIS COUNTY FLOOD CONTROL DISTRICT	9900 NW FRWY	HOUSTON	TX	77092-8601
29	CHANNELVIEW ISD	828 SHELDON RD	CHANNELVIEW	TX	77530-3512
30	CLARK H C	ADDRESS UNKNOWN	UNKNOWN		
31	CLOWERS ROBERT C	2220 18TH ST	GALENA PARK	TX	77547-2111
32	COLGLAZIER MARY C MD	ADDRESS UNKNOWN	UNKNOWN		00000
33	COLLINS ALLEN T	21703 RIO VILLA DR S	HOUSTON	TX	77049-3262
34	CONGREGATION BETH ISRAEL	5700 N BRAESWOOD BLVD	HOUSTON	TX	77096
35	CONWELL WILLIAM	111 GRACE LN	HIGHLANDS	TX	77562-2061
36	COULSON W J JR	4814 KNICKERBOCKER ST	HOUSTON	TX	77035-3428
37	COULSON WILLIAM JR ESTATE	4946 HEATHERGLEN DR	HOUSTON	TX	77096-4214
38	COUNTY OF HARRIS	PO BOX 1525	HOUSTON	TX	77251-1525
39	COX LAWRENCE III	PO BOX 780	CHANNELVIEW	TX	77530-0780
40	CRAMER GRETA B ET AL	974 ENCHANTED WAY	PACIFIC PALISADES	CA	90272-2823
41	CRUZ-SANCHEZ SABINA	2134 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
42	CURRENT OWNER	ADDRESS UNKNOWN	HOUSTON	TX	77087
43	CURRENT OWNER	ADDRESS UNKNOWN	HOUSTON	TX	
44	CURRENT OWNER	ADDRESS UNKNOWN	HOUSTON	TX	
45	D I B MILLER PROPERTY LTD	PO BOX 1509	CHANNELVIEW	TX	77530-1509
46	DAVILA ROLANDO & MARIA D	1934 JAMIE ERIN LN	CHANNELVIEW	TX	77530-2773
47	DAY HARRIET LAVERN	PO BOX 920546	HOUSTON	TX	77292-0546
48	DELCARPIO JULIO & DAMARIS	1614 PARK DR	CHANNELVIEW	TX	77530-2720
49	DESTINED ENTERPRISES LLC	6606 MILLER ROAD 2	HOUSTON	TX	77049-4834
50	DOAN ROSA N & QUANG N	7827 GULFTON ST	HOUSTON	TX	77036-2813
51	DOMINGUEZ JULIAN	115 AVONDALE ACCESS RD	HENDERSONVILLE	TN	37075-5842
52	DURAN LEONARDO	2210 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-7700
53	EASON CORTNEY J	PO BOX 740	HIGHLANDS	TX	77562-0740
54	EXXON CORP 00088	PO BOX 64106	SPRING	TX	77387-4106
55	FILECIA JOSEPH H & DEEDIE	16825 AVENUE B	CHANNELVIEW	TX	77530-3008
56	FLEMING W A	ADDRESS UNKNOWN	HOUSTON	TX	
57	FLORIO BONNIE	7815 DELYNN ST	BAYTOWN	TX	77521-9300
58	GANZE ADA ET AL	PO BOX 924267	HOUSTON	TX	77292-4267
59	GANZE ADA JANE JOHNSON	3414 FLEMING DR	BAYTOWN	TX	77521-9226
60	GARCIA ADAN V & LINDA M	16803 SHADY LN	CHANNELVIEW	TX	77530-2746
61	GARCIA JERRY B	1524 PARK DR	CHANNELVIEW	TX	77530-2718
62	GARCIA JORGE	16023 KELLI ST	CHANNELVIEW	TX	77530-2709
63	GONZALEZ BERNARD JR	PO BOX 24205	HOUSTON	TX	77229-4205
64	GREENWOOD 7450 INDUSTRIAL	7450 MILLER RD 2	HOUSTON	TX	77049-4818
65	GROENDYKE TRANSPORT INC	PO BOX 632	ENID	OK	73702-0632
66	GS3 ENTERPRISES LLC	4150 CAIRO RD	PADUCAH	KY	42001-9179
67	GUERRA JOSE RENEE	16009 KELLI ST	CHANNELVIEW	TX	77530-2709
68	GUZMAN LETICIA GARCIA	1808 E HARRIS	PASADENA	TX	77506-3726
69	HARRELSON DARRELL L & MARTHA A	1618 PARK DR	CHANNELVIEW	TX	77530-2720
70	HARRIS COUNTY FLOOD CONTROL DISTRICT	9900 NORTHWEST FWY	HOUSTON	TX	77092-8601

ATTACHMENT A-4-2 Landowner List
Lyondell Channelview South Plant
WQ0002927000

MAP ID	CURRENT OWNER	ADDRESS	CITY	STATE	ZIP CODE
71	HERNANDEZ CIPRIANO & OLGA	2106 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
72	HERNANDEZ JUAN C	13005 KNOLLCREST ST	HOUSTON	TX	77015-4319
73	HOUSTON JEWISH GERIATRIC FOUNDATION INC	6200 N BRAESWOOD BLVD	HOUSTON	TX	77074-7536
74	HURTADO JAVIER	16618 GREEN FEATHER DR	HOUSTON	TX	77049-0002
75	JDA HOLDINGS INC	22876 FRASER DR	PORTER	TX	77365-3755
76	JELSON GEORGE A	11018 WOODLAND AVE NE	ALBUQUERQUE	NM	87112-1683
77	JOHNSON HARRY KEENE III	20626 HANNINGTON LN	KATY	TX	77450-5034
78	JONES BURNEY W	PO BOX 472	GREENVILLE	TX	75403-0472
79	JUAREZ EMILY A	1723 SUNSHINE ST	HOUSTON	TX	77049
80	JUBILEE VENTURES INIC	6533 SHELDON RD	HOUSTON	TX	77049-3105
81	KAHN ROSA TAUB	PO BOX 1354	CHICAGO	IL	60690-1354
82	KELLAM JACUELIN KEENE	155 PRIMROSE LN	FREDERICKSBURG	TX	78624-7221
83	LA DOAN THUY	2403 RIDGEBROOK LN	PEARLAND	TX	77584-2551
84	LABUFF JAMES & RHONDA	687 COUNTY ROAD 2230	CLEVELAND	TX	77327-9251
85	LAFAYETTE SAMMIE JOYCE	4906 MEADOW CREST ST	LA PORTE	TX	77571-2835
86	LAMAR J L	207 S MAGNOLIA ST	HIGHLANDS	TX	77562-3755
87	LEA RAE CARR TITUS ESTATE	PO BOX 713	FREDERICKSBURG	TX	78624-0713
88	LEGER MARK A & LORIE A	16519 LISA DAWN LN	HOUSTON	TX	77049-4911
89	LEWIS VIVIAN	2110 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
90	LEXINGTON 26 LP	1314 N DURHAM DR STE 200	HOUSTON	TX	77008-3781
91	LLANAS PABLO	2138 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
92	LOGAN JAMES A	ADDRESS UNKNOWN		TX	
93	LOPEZ MARIO A & CHRYSTAL BARBARA	2158 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
94	LUM REBECCA	7941 KATY FWY STE 331	HOUSTON	TX	77024-1924
95	LUN Z M MRS	ADDRESS UNKNOWN	HOUSTON	TX	
96	MAKNOJIA ABDUL	6706 APSLEY CREEK LN	SUGAR LAND	TX	77479-4375
97	MARTINEZ FELIPE	7334 ANZAC ST	HOUSTON	TX	77020-5412
98	MARTINEZ RICARDO	434 TERMINAL ST	HOUSTON	TX	77020-5634
99	MCCANN COREY	2130 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
100	MEDRANO GERARDO	6830 MILLER ROAD 2	HOUSTON	TX	77049-4830
101	MICHAEL TRAN & CHRISTINE DINH	1398 ELDRIDGE PKWY STE 210	HOUSTON	TX	77077-2548
102	MIDCON TEXAS PIPELINE CORP PROPERTY TAX DEPT	PO BOX 4372	HOUSTON	TX	77210-4372
103	MILLER ROAD INDUSTRIAL PARK LP	7410 MILLER ROAD NO 2	HOUSTON	TX	77049-
104	MILLS COLLEGE	5000 MACARTHUR BLVD	OAKLAND	CA	94613-1301
105	MISSOURI PACIFIC RAILROAD COMPANY	1400 DOUGLAS ST STOP 1640	OMAHA	NE	68179-1001
106	MIZELL BUFORD E	2302 SPRING LAKE PARK LN	SPRING	TX	77386-3418
107	MJF PRINCIPAL HOLDING SLLC	3209 SALISBURY CT	FRIENDSWOOD	TX	77546-2532
108	MORAIDA EDWARD	3802 NICOLE DR	PASADENA	TX	77503-1859
109	MURRAY CHARLES W & LUCY	503 N BURNETT DR	BAYTOWN	TX	77520-1111
110	MYLIUS LYNN A	PO BOX 713	FREDERICKSBURG	TX	78624-0713
111	NGC HOLDING CO INC ET AL	13430 NORTHWEST FWY STE 1200	HOUSTON	TX	77040-6052
112	NGUYEN HUONG THI THU	PO BOX 1442	HIGHLANDS	TX	77562-1442
113	NGUYEN MINH P	PO BOX 1442	HIGHLANDS	TX	77562-1442
114	NIEVES MARIA	1428 PARK DR	CHANNELVIEW	TX	77530-2946
115	NSA PROPERTY HOLDINGS LLC	8400 E PRENTICE AVE 9TH FLR	GREENWOOD VILLAGE	CO	80111-2912
116	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
117	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
118	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
119	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
120	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
121	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
122	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
123	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
124	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
125	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
126	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
127	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
128	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
129	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
130	OWNER UNKNOWN	ADDRESS UNKNOWN	UNKNOWN		
131	PAGE ARBARRA ANN	16612 SHADY LN	CHANNELVIEW	TX	77530-2760
132	PASILLAS JAIME	16537 SHADY LN	CHANNELVIEW	TX	77530-2761
133	PEDROZA JUAN E	2114 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
134	PERRY JOSEPH R	9900 NW FRWY	HOUSTON	TX	77092-8601
135	PORT OF HOUSTON AUTHORITY	111 EAST LOOP N	HOUSTON	TX	77029-4326
136	PORT SERV USA INC	9002 SHELDON RD	HOUSTON	TX	77049-1811
137	QUINTANA EDGAR H	6000 REIMS RD STE 2807	HOUSTON	TX	77036-3020
138	QUIROGA AGUSTIN	251 BALLANTRAE LN	HOUSTON	TX	77015-1501
139	RAMOS JOSE & EVELYN	2150 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
140	RANCHO VERDE RESIDENTIAL COMMUNITY INC	PO BOX 63178	PIPE CREEK	TX	78063-3178

ATTACHMENT A-4-2 Landowner List
Lyondell Channelview South Plant
WQ0002927000

MAP ID	CURRENT OWNER	ADDRESS	CITY	STATE	ZIP CODE
141	REDDY MUDUGANTI J	24811 BOULDER LAKES CT	KATY	TX	77494-3900
142	REED GEORGE M	PO BOX 345	LA MARQUE	TX	77568-0345
143	REED ROSE OLIN MRS	907 N MARSHALL DR	OKLAHOMA CITY	OK	73110-5336
144	RENFRO BARRY L	415 MILL PLACE CT	SUGAR LAND	TX	77498-2678
145	RENFRO MARY	PO BOX 713	FREDERICKSBURG	TX	78624-0713
146	REX DANNY L & STEPHANIE J	1424 PARK DR	CHANNELVIEW	TX	77530-2946
147	RIVAS ANTONIO P	1518 E FORDYCE AVE	KINGSVILLE	TX	78363-6074
148	ROACH FRANK	7720 BOWEN ST	HOUSTON	TX	77051-1612
149	ROBERTS DANIEL	ADDRESS UNKNOWN	HOUSTON	TX	
150	ROBLEDO DAVID	16618 LISA DAWN LN	HOUSTON	TX	77049-4906
151	ROBLEDO LINDA DELAVEGA	2206 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-7700
152	RODRIGUEZ JAVIER	16107 AVENUE C	CHANNELVIEW	TX	77530-3707
153	ROSALES RUBIN O	6006 MOONMIST DR	HOUSTON	TX	77081-4311
154	RYDER TRUCK RENTAL INC	PO BOX 25719	MIAMI	FL	33102-5719
155	SAKOMBI JEAN LEON A & SCHOLASTIQUE B	2118 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049
156	SALINAS JESUS J	14123 SEAGLER SPRINGS LN	HOUSTON	TX	77044-2054
157	SANCHEZ JESSICA Y & RODOLFO	6730 AMBERDALE DR	FORT WORTH	TX	76137-6304
158	SCHNARR INETTA S & ET AL	16435 LISA DAWN LN	HOUSTON	TX	77049-4909
159	SEAH STEEL USA LLC	16952 LEONARD RD	HOUSTON	TX	77049-1800
160	SELLERS RANDY & JAN	PO BOX 70	CHANNELVIEW	TX	77530-0070
161	SERRANO WILLIAM A	2202 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-7700
162	SETTLE FORESTLINE H	ADDRESS UNKNOWN	HOUSTON	TX	
163	SMITH R V	ADDRESS UNKNOWN		TX	
164	SNYDER DAVID	1502 DIVERS LN	CHANNELVIEW	TX	77530-2948
165	SOJOURN PARTNERS LLC	9200 SHELDON RD	HOUSTON	TX	77049-1248
166	SOUTHERN PACIFIC RAILROAD COMPANY	1400 DOUGLAS ST STOP 1640	OMAHA	NE	68179-1001
167	SOUTHVIEW LOGISTICS INC	13410 HOLLYPARK DR	HOUSTON	TX	77015-2901
168	STAMANT PAUL	2154 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
169	STARNES RANDLE	1332 CLEAR LAKE RD	HIGHLANDS	TX	77562-3533
170	STATE OF TEXAS % TEXAS GENERAL LAND OFFICE	PO BOX 1386	AUSTIN	TX	78767-1386
171	STEWART DOUGLAS R & JOYCE	16916 SHADY LN	CHANNELVIEW	TX	77530-2749
172	SUNRISE P AND I LLC	17310 GLENHEW RD	HUMBLE	TX	77396-1642
173	T W I DEV CO % MRS LEROY MUSICK	1323 CHIPPENDALE RD	HOUSTON	TX	77018-5257
174	TABATABAI SEYED A & ANA	1516 PARK DR	CHANNELVIEW	TX	77530-2718
175	TAYLOR THOMAS N % THOS L BROWN ATTORNEY	7017 PASEO BLVD	KANSAS CITY	MO	64132-3109
176	TC TERMINALS LLC	PO BOX 2168	HOUSTON	TX	77252-2168
177	TEX TRUDE INC	2001 SHELDON RD	CHANNELVIEW	TX	77530-2685
178	TEXAN LAND AND CATTLE II LTD	PO BOX 130979	HOUSTON	TX	77219-0979
179	TF WARREN GROUP CORPORATION	16201 WOOD DR	CHANNELVIEW	TX	77530-2729
180	THORP PETROLEM CORPORATION	1001 MCKINNEY ST STE 2200	HOUSTON	TX	77002-6418
181	TIDEWATER TRANSIT CO INC	PO BOX 189	KINSTON	NC	28502-0189
182	TORRES JOEL A	2146 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049
183	UNKNOWN	ADDRESS UNKNOWN	HOUSTON	TX	77030
184	V & M STAR	2107 CITYWEST BLVD STE 1300	HOUSTON	TX	77042-2827
185	VARCO LP	10000 RICHMOND AVE STE 600	HOUSTON	TX	77042-4393
186	VARGAS JUAN J	1922 WAGON BOSS RD	HOUSTON	TX	77049-6508
187	VASTAR RESOURCES INC	PO BOX 941709	HOUSTON	TX	77094-8709
188	VAZQUEZ ROLANDO & CRISTINA E	6627 MILLER ROAD 2	HOUSTON	TX	77049-4833
189	VELMON ENTERPRISE LLC	1432 PARK DR	CHANNELVIEW	TX	77530-2946
190	WACHELESKI NATANIEL M & JOYVANNA	2122 HARVEY BROWN SCHOOL DR	HOUSTON	TX	77049-0003
191	WALLACE AGNES	ADDRESS UNKNOWN		TX	
192	WILLIAMS FIELD SERVICES	1900 DALROCK RD	ROWLETT	TX	75088-5526
193	WILLIAMS FIELD SERVICES GULF	ONE WILLIAMS CENTER	TULSA	OK	74172-0140
194	WILVER RAY L & JOHN L	7 SONGBIRD LN	MILTON	PA	17847-9536
195	WINDHAM EDITH MARIE	1514 PARK DR	CHANNELVIEW	TX	77530-2718
196	ZUBIK MARK E	16725 SHADY LN	CHANNELVIEW	TX	77530-2744

ABEJA MOBILE HOMES LLC
PO BOX 271564
HOUSTON TX 77277-1564

ADLOY LLC
623 W TEXAS AVE
BAYTOWN TX 77520-4755

AGUINAGA LUIS
2102 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049

AICHLMAYR RICKY W & PENNY %
RICKY AICHMAYR
22406 CORIANDER DR
KATY TX 77450-1520

AIR LIQUIDE AMERICA CORP
PROPERTY TAX DEPARTMENT
9811 KATY FREEWAY STE 100
HOUSTON TX 77024-1274

ALBIN E
3427 VINEYARD DR
HOUSTON TX 77082-1325

APACHE GLOBAL PAINTING INC
PO BOX 670369
HOUSTON TX 77267-0369

ASKEW INVESTMENTS PROPERTIES
SERIES LLC
PO BOX 459
CHANNELVIEW TX 77530-0459

ATS SPECIALIZED INC
PO BOX 1377
SAINT CLOUD MN 56302-1377

B D DEV
PO BOX 8450
HOUSTON TX 77288-8450

B H KELLEY
ADDRESS UNKNOWN
TX

BACHARELIS CESAR A
15536 AVENUE C
CHANNELVIEW TX 77530-4024

BADILLO BENJAMIN JR
2142 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

BALKE THOMAS E & MARY RENEE
18803 WALLISVILLE RD
HOUSTON TX 77049-5036

BAYTOWN BOAT CLUB
PO BOX 285
HIGHLANDS TX 77562-0285

BEASLEY DAVID H & KRISTIN E
1612 PARK DR
CHANNELVIEW TX 77530-2720

BERNAL ANA L
16015 KELLI ST
CHANNELVIEW TX 77530-2709

BLANCHARD ELIZABETH
797 FM 1005
JASPER TX 75951-6907

CABANISS ROBERT & CANDY F
16602 SHADY LN
CHANNELVIEW TX 77530-2760

CALVIN C C
ADDRESS UNKNOWN
HOUSTON TX 77059

CAMO CHEMICAL PROPERTIES LLC
16950 WALLISVILLE RD
HOUSTON TX 77049-5014

CARDEN KENNETH D
1620 PARK DR
CHANNELVIEW TX 77530-2720

CARL & LOS MITTEN FAMILY
2501 MUSEUM WAY APT 717
FORT WORTH TX 76107-8006

CAROLYN C TAUB INTERESTS II LLC
PO BOX 27423
HOUSTON TX 77227-7423

CASTILLO JOSE I & NOHELIA
16226 MILLERS LANDING LN
HOUSTON TX 77049-4842

CAVAZOS ABEL PEDRO
2160 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049

CENTERPOINT ENERGY HOU ELE
PO BOX 1475
HOUSTON TX 77251-1475

HARRIS COUNTY FLOOD CONTROL
DISTRICT
9900 NW FRWY
HOUSTON TX 77092-8601

CHANNELVIEW ISD
828 SHELDON RD
CHANNELVIEW TX 77530-3512

CLARK H C
ADDRESS UNKNOWN
UNKNOWN

CLOWERS ROBERT C
2220 18TH ST
GALENA PARK TX 77547-2111

COLGLAZIER MARY C MD
ADDRESS UNKNOWN
UNKNOWN 00000

COLLINS ALLEN T
21703 RIO VILLA DR S
HOUSTON TX 77049-3262

CONGREGATION BETH ISRAEL
5700 N BRAESWOOD BLVD
HOUSTON TX 77096

CONWELL WILLIAM
111 GRACE LN
HIGHLANDS TX 77562-2061

COULSON W J JR
4814 KNICKERBOCKER ST
HOUSTON TX 77035-3428

COULSON WILLIAM JR ESTATE
4946 HEATHERGLEN DR
HOUSTON TX 77096-4214

COUNTY OF HARRIS
PO BOX 1525
HOUSTON TX 77251-1525

COX LAWRENCE III
PO BOX 780
CHANNELVIEW TX 77530-0780

CRAMER GRETA B ET AL
974 ENCHANTED WAY
PACIFIC PALISADES CA 90272-2823

CRUZ-SANCHEZ SABINA
2134 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

CURRENT OWNER
ADDRESS UNKNOWN
HOUSTON TX 77087

CURRENT OWNER
ADDRESS UNKNOWN
HOUSTON TX

CURRENT OWNER
ADDRESS UNKNOWN
HOUSTON TX

D I B MILLER PROPERTY LTD
PO BOX 1509
CHANNELVIEW TX 77530-1509

DAVILA ROLANDO & MARIA D
1934 JAMIE ERIN LN
CHANNELVIEW TX 77530-2773

DAY HARRIET LAVERN
PO BOX 920546
HOUSTON TX 77292-0546

DELCARPIO JULIO & DAMARIS
1614 PARK DR
CHANNELVIEW TX 77530-2720

DESTINED ENTERPRISES LLC
6606 MILLER ROAD 2
HOUSTON TX 77049-4834

DOAN ROSA N & QUANG N
7827 GULFTON ST
HOUSTON TX 77036-2813

DOMINGUEZ JULIAN
115 AVONDALE ACCESS RD
HENDERSONVILLE TN 37075-5842

DURAN LEONARDO
2210 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-7700

EASON CORTNEY J
PO BOX 740
HIGHLANDS TX 77562-0740

EXXON CORP 00088
PO BOX 64106
SPRING TX 77387-4106

FILECIA JOSEPH H & DEEDIE
16825 AVENUE B
CHANNELVIEW TX 77530-3008

FLEMING W A
ADDRESS UNKNOWN
HOUSTON TX

FLORIO BONNIE
7815 DELYNN ST
BAYTOWN TX 77521-9300

GANZE ADA ET AL
PO BOX 924267
HOUSTON TX 77292-4267

GANZE ADA JANE JOHNSON
3414 FLEMING DR
BAYTOWN TX 77521-9226

GARCIA ADAN V & LINDA M
16803 SHADY LN
CHANNELVIEW TX 77530-2746

GARCIA JERRY B
1524 PARK DR
CHANNELVIEW TX 77530-2718

GARCIA JORGE
16023 KELLI ST
CHANNELVIEW TX 77530-2709

GONZALEZ BERNARD JR
PO BOX 24205
HOUSTON TX 77229-4205

GREENWOOD 7450 INDUSTRIAL
7450 MILLER RD 2
HOUSTON TX 77049-4818

GROENDYKE TRANSPORT INC
PO BOX 632
ENID OK 73702-0632

GS3 ENTERPRISES LLC
4150 CAIRO RD
PADUCAH KY 42001-9179

GUERRA JOSE RENEE
16009 KELLI ST
CHANNELVIEW TX 77530-2709

GUZMAN LETICIA GARCIA
1808 E HARRIS
PASADENA TX 77506-3726

HARRELSON DARRELL L & MARTHA A
1618 PARK DR
CHANNELVIEW TX 77530-2720

HARRIS COUNTY FLOOD CONTROL DISTRICT
9900 NORTHWEST FWY
HOUSTON TX 77092-8601

HERNANDEZ CIPRIANO & OLGA
2106 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

HERNANDEZ JUAN C
13005 KNOLLCREST ST
HOUSTON TX 77015-4319

HOUSTON JEWISH GERIATRIC FOUNDATION INC
6200 N BRAESWOOD BLVD
HOUSTON TX 77074-7536

HURTADO JAVIER
16618 GREEN FEATHER DR
HOUSTON TX 77049-0002

JDA HOLDINGS INC
22876 FRASER DR
PORTER TX 77365-3755

JELSON GEORGE A
11018 WOODLAND AVE NE
ALBUQUERQUE NM 87112-1683

JOHNSON HARRY KEENE III
20626 HANNINGTON LN
KATY TX 77450-5034

JONES BURNEY W
PO BOX 472
GREENVILLE TX 75403-0472

JUAREZ EMILY A
1723 SUNSHINE ST
HOUSTON TX 77049

JUBILEE VENTURES INIC
6533 SHELDON RD
HOUSTON TX 77049-3105

KAHN ROSA TAUB
PO BOX 1354
CHICAGO IL 60690-1354

KELLAM JACUELIN KEENE
155 PRIMROSE LN
FREDERICKSBURG TX 78624-7221

LA DOAN THUY
2403 RIDGEBROOK LN
PEARLAND TX 77584-2551

LABUFF JAMES & RHONDA
687 COUNTY ROAD 2230
CLEVELAND TX 77327-9251

LAFAYETTE SAMMIE JOYCE
4906 MEADOW CREST ST
LA PORTE TX 77571-2835

LAMAR J L
207 S MAGNOLIA ST
HIGHLANDS TX 77562-3755

LEA RAE CARR TITUS ESTATE
PO BOX 713
FREDERICKSBURG TX 78624-0713

LEGER MARK A & LORIE A
16519 LISA DAWN LN
HOUSTON TX 77049-4911

LEWIS VIVIAN
2110 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

LEXINGTON 26 LP
1314 N DURHAM DR STE 200
HOUSTON TX 77008-3781

LLANAS PABLO
2138 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

LOGAN JAMES A
ADDRESS UNKNOWN
TX

LOPEZ MARIO A & CHRYSTAL BARBARA
2158 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

LUM REBECCA
7941 KATY FWY STE 331
HOUSTON TX 77024-1924

LUN Z M MRS
ADDRESS UNKNOWN
HOUSTON TX

MAKNOJIA ABDUL
6706 APSLEY CREEK LN
SUGAR LAND TX 77479-4375

MARTINEZ FELIPE
7334 ANZAC ST
HOUSTON TX 77020-5412

MARTINEZ RICARDO
434 TERMINAL ST
HOUSTON TX 77020-5634

MCCANN COREY
2130 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

MEDRANO GERARDO
6830 MILLER ROAD 2
HOUSTON TX 77049-4830

MICHAEL TRAN & CHRISTINE DINH
1398 ELDRIDGE PKWY STE 210
HOUSTON TX 77077-2548

MIDCON TEXAS PIPELINE CORP
PROPERTY TAX DEPT
PO BOX 4372
HOUSTON TX 77210-4372

MILLER ROAD INDUSTRIAL PARK LP
7410 MILLER ROAD NO 2
HOUSTON TX 77049-

MILLS COLLEGE
5000 MACARTHUR BLVD
OAKLAND CA 94613-1301

MISSOURI PACIFIC RAILROAD COMPANY
1400 DOUGLAS ST STOP 1640
OMAHA NE 68179-1001

MIZELL BUFORD E
2302 SPRING LAKE PARK LN
SPRING TX 77386-3418

MJF PRINCIPAL HOLDING SLLC
3209 SALISBURY CT
FRIENDSWOOD TX 77546-2532

MORAIDA EDWARD
3802 NICOLE DR
PASADENA TX 77503-1859

MURRAY CHARLES W & LUCY
503 N BURNETT DR
BAYTOWN TX 77520-1111

MYLIUS LYNN A
PO BOX 713
FREDERICKSBURG TX 78624-0713

NGC HOLDING CO INC ET AL
13430 NORTHWEST FWY STE 1200
HOUSTON TX 77040-6052

NGUYEN HUONG THI THU
PO BOX 1442
HIGHLANDS TX 77562-1442

NGUYEN MINH P
PO BOX 1442
HIGHLANDS TX 77562-1442

NIEVES MARIA
1428 PARK DR
CHANNELVIEW TX 77530-2946

NSA PROPERTY HOLDINGS LLC
8400 E PRENTICE AVE 9TH FLR
GREENWOOD VILLAGE CO 80111-2912

OWNER UNKNOWN
ADDRESS UNKNOWN
UNKNOWN

OWNER UNKNOWN
ADDRESS UNKNOWN
UNKNOWN

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OWNER UNKNOWN
ADDRESS UNKNOWN
UNKNOWN

PAGE ARBARRA ANN
16612 SHADY LN
CHANNELVIEW TX 77530-2760

PASILLAS JAIME
16537 SHADY LN
CHANNELVIEW TX 77530-2761

PEDROZA JUAN E
2114 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

PERRY JOSEPH R
9900 NW FRWY
HOUSTON TX 77092-8601

PORT OF HOUSTON AUTHORITY
111 EAST LOOP N
HOUSTON TX 77029-4326

PORT SERV USA INC
9002 SHELDON RD
HOUSTON TX 77049-1811

QUINTANA EDGAR H
6000 REIMS RD STE 2807
HOUSTON TX 77036-3020

QUIROGA AGUSTIN
251 BALLANTRAE LN
HOUSTON TX 77015-1501

RAMOS JOSE & EVELYN
2150 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

RANCHO VERDE RESIDENTIAL
COMMUNITY INC
PO BOX 63178
PIPE CREEK TX 78063-3178

REDDY MUDUGANTI J
24811 BOULDER LAKES CT
KATY TX 77494-3900

REED GEORGE M
PO BOX 345
LA MARQUE TX 77568-0345

REED ROSE OLIN MRS
907 N MARSHALL DR
OKLAHOMA CITY OK 73110-5336

RENFRO BARRY L
415 MILL PLACE CT
SUGAR LAND TX 77498-2678

RENFRO MARY
PO BOX 713
FREDERICKSBURG TX 78624-0713

REX DANNY L & STEPHANIE J
1424 PARK DR
CHANNELVIEW TX 77530-2946

RIVAS ANTONIO P
1518 E FORDYCE AVE
KINGSVILLE TX 78363-6074

ROACH FRANK
7720 BOWEN ST
HOUSTON TX 77051-1612

ROBERTS DANIEL
ADDRESS UNKNOWN
HOUSTON TX

ROBLEDO DAVID
16618 LISA DAWN LN
HOUSTON TX 77049-4906

ROBLEDO LINDA DELAVEGA
2206 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-7700

RODRIGUEZ JAVIER
16107 AVENUE C
CHANNELVIEW TX 77530-3707

ROSALES RUBIN O
6006 MOONMIST DR
HOUSTON TX 77081-4311

RYDER TRUCK RENTAL INC
PO BOX 25719
MIAMI FL 33102-5719

SAKOMBI JEAN LEON A &
SCHOLASTIQUE B
2118 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049

SALINAS JESUS J
14123 SEAGLER SPRINGS LN
HOUSTON TX 77044-2054

SANCHEZ JESSICA Y & RODOLFO
6730 AMBERDALE DR
FORT WORTH TX 76137-6304

SCHNARR INETTA S & ET AL
16435 LISA DAWN LN
HOUSTON TX 77049-4909

SEAH STEEL USA LLC
16952 LEONARD RD
HOUSTON TX 77049-1800

SELLERS RANDY & JAN
PO BOX 70
CHANNELVIEW TX 77530-0070

SERRANO WILLIAM A
2202 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-7700

SETTLE FORESTLINE H
ADDRESS UNKNOWN
HOUSTON TX

SMITH R V
ADDRESS UNKNOWN
TX

SNYDER DAVID
1502 DIVERS LN
CHANNELVIEW TX 77530-2948

SOJOURN PARTNERS LLC
9200 SHELDON RD
HOUSTON TX 77049-1248

SOUTHERN PACIFIC RAILROAD
COMPANY
1400 DOUGLAS ST STOP 1640
OMAHA NE 68179-1001

SOUTHVIEW LOGISTICS INC
13410 HOLLYPARK DR
HOUSTON TX 77015-2901

STAMANT PAUL
2154 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

STARNES RANDLE
1332 CLEAR LAKE RD
HIGHLANDS TX 77562-3533

STATE OF TEXAS % TEXAS GENERAL
LAND OFFICE
PO BOX 1386
AUSTIN TX 78767-1386

STEWART DOUGLAS R & JOYCE
16916 SHADY LN
CHANNELVIEW TX 77530-2749

SUNRISE P AND I LLC
17310 GLENHEW RD
HUMBLE TX 77396-1642

T W I DEV CO % MRS LEROY MUSICK
1323 CHIPPENDALE RD
HOUSTON TX 77018-5257

TABATABAI SEYED A & ANA
1516 PARK DR
CHANNELVIEW TX 77530-2718

TAYLOR THOMAS N % THOS L
BROWN ATTORNEY
7017 PASEO BLVD
KANSAS CITY MO 64132-3109

TC TERMINALS LLC
PO BOX 2168
HOUSTON TX 77252-2168

TEX TRUDE INC
2001 SHELDON RD
CHANNELVIEW TX 77530-2685

TEXAN LAND AND CATTLE II LTD
PO BOX 130979
HOUSTON TX 77219-0979

TF WARREN GROUP CORPORATION
16201 WOOD DR
CHANNELVIEW TX 77530-2729

THORP PETROLEM CORPORATION
1001 MCKINNEY ST STE 2200
HOUSTON TX 77002-6418

TIDEWATER TRANSIT CO INC
PO BOX 189
KINSTON NC 28502-0189

TORRES JOEL A
2146 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049

UNKNOWN
ADDRESS UNKNOWN
HOUSTON TX 77030

V & M STAR
2107 CITYWEST BLVD STE 1300
HOUSTON TX 77042-2827

VARCO LP
10000 RICHMOND AVE STE 600
HOUSTON TX 77042-4393

VARGAS JUAN J
1922 WAGON BOSS RD
HOUSTON TX 77049-6508

VASTAR RESOURCES INC
PO BOX 941709
HOUSTON TX 77094-8709

VAZQUEZ ROLANDO & CRISTINA E
6627 MILLER ROAD 2
HOUSTON TX 77049-4833

VELMON ENTERPRISE LLC
1432 PARK DR
CHANNELVIEW TX 77530-2946

WACHELESKI NATANIEL M &
JOYVANNA
2122 HARVEY BROWN SCHOOL DR
HOUSTON TX 77049-0003

WALLACE AGNES
ADDRESS UNKNOWN
TX

WILLIAMS FIELD SERVICES
1900 DALROCK RD
ROWLETT TX 75088-5526

WILLIAMS FIELD SERVICES GULF
ONE WILLIAMS CENTER
TULSA OK 74172-0140

WILVER RAY L & JOHN L
7 SONGBIRD LN
MILTON PA 17847-9536

WINDHAM EDITH MARIE
1514 PARK DR
CHANNELVIEW TX 77530-2718

ZUBIK MARK E
16725 SHADY LN
CHANNELVIEW TX 77530-2744

ATTACHMENT A-5
Outfall Photos

Overall Aerial Map

Aerial view showing Outfall 001 sampling point and pipe discharge into ditch and Outfall 002 weir just upstream of Outfall 001. The discharge from both outfalls flows into HCFCD G103-02-03 ditch shown at bottom. Photo orientation as marked.

ATTACHMENT A-5
Outfall Photos

Aerial view showing Outfalls 003, 004, 005, and 006. Photo orientation as marked. Photos are not provided of Outfalls 007, 008, 009, or 010 because they have not been constructed yet.

Photo 1. Outfall 001 sample point looking southwest

ATTACHMENT A-5
Outfall Photos

Photo 2. Outfall 001 pipe discharge to ditch looking northeast. Outfall 002 weir structure seen behind pipe.

Photo 3. Looking south from Outfall 002, outfall weir photo center. Outfall 001 pipe upper right, discharging to ditch.

ATTACHMENT A-5
Outfall Photos

Photo 4. Outfall 002 looking north back towards plant.

Photo 5. Outfall 003 weir looking west.

ATTACHMENT A-5
Outfall Photos

Photo 6. Outfall 003 looking northeast.

Photo 7. Outfall 004 looking east.

ATTACHMENT A-5
Outfall Photos

Photo 8. Outfall 005 weir looking south.

Photo 9. Outfall 005 weir center left, looking west.

ATTACHMENT A-5
Outfall Photos

Photo 10. Outfall 006 weir looking south.

ATTACHMENT A-6
Fee Payment Receipt

Basis2 Receipt Report by Endorsement Number

DEC-08-20 04:05 PM

Acct. #: PTGQ **Account Name:** NOTICE FEES WQP WATER QUALITY PMT

Paid For	Endors. #	Ref #2	Paid In By	PayTyp	Chk #	Card#	Bank Slip	Tran.Date	Receipt Amnt.
RENEW/MAJOR AMEND/LYONDELLBASEL L/CHANNEL	WRS0024500	02927000	LYB AMERICAS FIN	WT	WIRE		BS00084138	01-DEC-20	$100.00

Acct. #: UIP **Account Name:** SUSP-UNIDENTIFIED PAYMENTS

Paid For	Endors. #	Ref #2	Paid In By	PayTyp	Chk #	Card#	Bank Slip	Tran.Date	Receipt Amnt.
	WRS0024500		LYB AMERICAS FIN	WT	WIRE		BS00084079	24-NOV-20	$2100.00

Acct. #: WQP **Account Name:** WATER QUALITY PERMIT APPLICATION

Paid For	Endors. #	Ref #2	Paid In By	PayTyp	Chk #	Card#	Bank Slip	Tran.Date	Receipt Amnt.
RENEW/MAJOR AMEND/LYONDELLBASEL L/CHANNEL	WRS0024500	02927000	LYB AMERICAS FIN	WT	WIRE		BS00084138	01-DEC-20	$2000.00

ATTACHMENT A-7

Harris County Flood Control District
9900 Northwest Freeway
Houston, Texas 77092
713-684-4000
www.hcfcd.org

January 17, 2013

Mr. Mark Olson
Lyondell Basell Chemical Co.
2502 Sheldon Road
Channelview, Texas 77530

RE: Wastewater Discharge from Lyondell Chemical Company
Discharge of 7.2 MGD
TCEQ Discharge Permit # WQ0002927000
HCFCD Unit G103-02-03

Dear Mr. Olson:

The Harris County Flood Control District (HCFCD) has received your application for discharge into a Flood Control or County facility. Harris County's waterways are impaired for bacteria (E. coli), therefore HCFCD requests that discharges from Lyondell Chemical Company be monitored for bacteria (E. coli) with the other required parameters. Also, HCFCD requests a copy of the Draft Permit effluent limits to be forward when received from TCEQ. Your application is being processed and we have no objection at this time to a maximum daily average of 7.2 MGD discharge of treated wastewater into or toward HCFCD Unit G103-02-03, as long as monitoring reports for bacteria (E. coli) and Draft Permit effluent limits are submitted to HCFCD.

Please note that construction plans designed in accordance with Harris County Flood Control District's criteria and other adopted policies must be submitted for review to the Watershed Department.

If you should have any questions or need additonal information, please contact our Stormwater Quality Department at 713-684-4177.

Sincerely,

Catherine A. Elliott
Stormwater Quality Department Manager

CAE:ag

Attachment: Copy of Letter

cc: Carl Woodward
Rondy Spardella
Project File 450

S:\Environmental\Master Documents (Forms)\NPDES FORMS\13-L1-17lyondell Lyondell Chemical Co G103-02-03 WWTP Approval Letter.doc

ATTACHMENT T-1

LYONDELL CHEMICAL COMPANY
CHANNELVIEW SOUTH PLANT
FACILITY DESCRIPTION
TPDES WQ0002927000

LYONDELL CHEMICAL COMPANY
CHANNELVIEW SOUTH PLANT
FACILITY DESCRIPTION
TPDES WQ0002927000

This document describes the Lyondell Chemical Company Channelview South Complex (Lyondell Channelview) in relation to its wastewater discharge permit, TPDES Permit WQ0002927000. Information is provided on facility operations, wastewaters discharged through the TPDES outfalls, wastewater and stormwater management, and applicability of national effluent guidelines.

FACILITY OPERATIONS

The Lyondell Chemical Company Channelview South Complex is located at 2502 Sheldon Road in Channelview, Texas. The facility produces bulk, commodity, and specialty organic chemicals. There is also an associated co-generation facility, which produces steam and electricity for use in the chemical manufacturing process. Lyondell is building a Propylene Oxide (PO)/Tertiary Butyl Alcohol (TBA) plant at the Channelview Facility with startup targeted for 2022.

Raw materials, intermediates, and final products associated with the manufacturing units are listed in Table 1.

THIRD-PARTY WASTEWATERS

A number of third-party facilities send wastewater to the Lyondell Channelview wastewater treatment system. These wastewaters are compatible and are treated in the wastewater treatment system. The volume and nature of these third-party wastewaters will not impact the ability to consistently achieve the effluent limitations specified in its TPDES permit.

A co-generation facility is located at the Lyondell Channelview South Complex. The co-generation facility provides steam and electricity and is owned and operated by Optim Energy Altura COGEN, LLC.[1] Wastewater streams sent to the wastewater treatment facility are effluent from a stormwater oil/water separator and maintenance water. Each wastewater stream has a flow rate of less than 10 gallons per minute.

Lyondell Channelview periodically receives hydrostatic test water from Equistar Pipeline Operations.[2] The hydrostatic test water is generated infrequently and potential contaminants in the test water are identical to those found in wastewater typically generated at Lyondell Channelview.

Periodically wastewater or activated sludge is received from other Lyondell/Equistar facilities that are located off-site. Wastewater from Equistar Chemicals, LP Channelview North Plant [3] may include

[1] Optim Energy Altura COGEN, LLC, 2330 Sheldon Road, Channelview, Texas 77530

[2] Equistar Pipeline Operations Mont Belvieu Terminal, 11815 Highway 146, Mont Belvieu, Texas 77580

[3] Equistar Chemicals, LP (Channelview North Plant), 8280 Sheldon Road, Channelview, Texas 77530

wastewater or stormwater from the Houston Technology Center (HTC),[4] which is normally treated and discharged under Equistar Channelview TPDES Permit WQ0000391000. Lyondell Chemical Company owns and operates HTC, which is adjacent to and north of Equistar Channelview. HTC functions as a Research and Development Center. HTC wastewater may include process wastewater, stormwater, and utility wastewater such as condensate blowdown from air handling units, air exchangers, and ventilation equipment. Flow rates are small, less than 500 gallons per day. Lyondell Channelview may also receive wastewater treatment sludge from Equistar Channelview for placement in the on-site landfarm.

WASTEWATER SYSTEM AND OUTFALLS

There are ten outfalls authorized by TPDES Permit WQ0002927000. Outfall 001 is the process wastewater outfall. The remaining outfalls (002, 003, 004, 005, 006, 007, 008, 009, 010) are primarily storm water outfalls.

Sources of wastewater are listed by outfall in Table 2, which indicates which wastewaters are listed in the current TPDES permit as well as other wastewaters requested to be added to or modified in in this TPDES amendment/renewal application. Wastewater flows by outfall are listed in Table 3-1 (Interim Phase without PO/TBA) and Table 3-2 (Final Phase with PO/TBA).

Figure 1 is a flow balance diagram that shows wastewater sources and treatment units. Figure 2 shows the overall flow routing in the wastewater system. Table 4 is a list of the primary components of the wastewater treatment system.

Outfall 001

Outfall 001 discharges treated process wastewater, utility wastewaters, stormwater, and other miscellaneous wastewaters. Certain process wastewaters are routed to the on-site biological wastewater treatment facility and others to the on-site underground injection system. A list of specific wastewaters that may be discharged through Outfall 001 is shown in Table 2. Outfall 001 discharges to an on-site ditch, thence to Harris County Flood Control Ditch (HCFCD) ditch G103-02-03, thence to Bear Lake, which is part of San Jacinto River Tidal (Segment No. 1001).

Existing Wastewater Treatment System

Treated effluent from the wastewater treatment system is discharged through Outfall 001. A description of the existing wastewater treatment system is provided in this section, and changes planned with the new PO/TBA project are provided in the following section.

Wastewaters from the Propylene Oxide/Styrene Monomer Unit I (PO/SM I), Ethylbenzene Unit I (EB I), Phenylethyl Alcohol (PEA) unit, PO/SM II, EB II units, and cogeneration unit (Cogen) are routed to two equalization tanks. Wastewaters from the MTBE/ETBE/HPIB/BDO units are normally routed directly from the process unit to the two equalization tanks. During abnormal operations, the

[4] Houston Technology Center, 8280 Sheldon Road, Channelview, Texas 77530

wastewater from the Butanediol (BDO) unit, MTBE/ETBE/HPIB units, and Polyols unit are routed to a surge tank prior to being sent to the equalization tanks due to the variability in wastewater composition. Use of the surge tank allows blending of the wastewater into the treatment system at a slow and controlled rate. If necessary, wastewater from the surge tank can be routed to the on-site underground injection system.

The primary function of the equalization system is to allow wastewater from the various sources to become uniformly mixed prior to the biological system. The equalization process dampens surges in hydraulic and organic loading to the biological treatment system, which results in more efficient operation.

In addition to the processes described above, it is also possible to neutralize the wastewater prior to treatment. This includes neutralization at the process units prior to routing to the wastewater treatment facilities or in the feed to the aeration tanks. Neutralization is accomplished by the addition of sulfuric acid to reduce the pH to an acceptable range for biological treatment. Occasionally, neutralization of the wastewater once within the wastewater treatment facilities is required.

From the two equalization tanks, the equalized wastewater flows to the two aeration tanks. Secondary treatment is provided through the activated sludge biological treatment process. The process combines biochemical reduction of soluble organic compounds by bacteria in the aeration system and the physical separation of the biosolids in the clarifying system. Nutrients are added to the wastewater as it is routed to the aeration tanks. The facility uses phosphoric acid and aqueous ammonia to supply the proper balance of nitrogen and phosphorus for biological treatment. The return activated sludge (biosolids) from the clarifiers is added directly to the aeration tanks.

The aeration system consists of two aboveground aerated tanks, which may be operated in series or in parallel. The aeration tanks are equipped with a jet mixing system that introduces air at the bottom of the tanks to ensure aerobic conditions and effective mixing between the microorganisms, wastewater, and nutrients. This results in the breaking down of the organic contaminants to stable materials such as water, carbon dioxide, and new cells. A third tank is available to serve as an additional aeration tank or digester on an as needed basis. This tank has surface mechanical aerators.

The effluent from the aeration tanks is routed to the final clarifiers where biosolids are removed by settling with the aid of treatment chemicals such as polymers and anti-foaming agents. A portion of the concentrated solids at the bottom of the clarifiers is returned to the aeration tanks (return activated sludge, RAS), which ensures that the activated sludge system is adequately populated with microorganisms. The remaining sludge (waste activated sludge, WAS) is routed to the aerobic sludge digester as part of the sludge handling system.

The clarified water overflows to a sump where it is combined with several non-process wastewaters, including cooling tower and boiler blowdown, and ion exchange regeneration wastewater, and these combined waters are discharged through Outfall 001.

Aerobic digestion of the waste sludge occurs in an in-ground basin. As noted above, the third aeration tank may also be used as an aerobic digester. This process results in a reduction of the volume of sludge, which is later landfarmed. Aerobic digestion occurs when the activated sludge is aerated over

a period time and utilizes its own biomass as a substrate. Periodically, digested sludge is routed to the adjacent sludge holding basin, which is used as a thickener to concentrate the solids further prior to landfarming the digested solids. The supernatant liquid from the sludge holding basin is pumped to the feed of the aeration tanks for reprocessing in the biological treatment facility.

The thickened sludge is pumped to one of the four operating cells at the Class II landfarm. Once a cell is at approximately 75% capacity with solids, the cell is taken out of service and dewatered. A crop is planted within the cell to further remove constituents from the sludge. Once the crop is matured, it is harvested and sent to an off-site waste disposal site. Afterwards, a filtration grass is planted within the cell. Once the grass is matured, the cell can be put back in service. Stormwater that accumulates in active landfarm cells is pumped back to the equalization tanks for treatment along with other industrial wastewaters. Stormwater that accumulates in inactive landfarm cells can be discharged though stormwater Outfall 002, or sent through wastewater treatment.

The other primary means of process wastewater disposal generated in the manufacturing units is by use of two on-site hazardous waste injection wells. As feasible, Lyondell implements projects to reroute streams that are currently being injected, to the biological treatment facility.

In addition to the process wastewaters, there are several non-process wastewater sources that discharge through Outfall 001, including cooling tower blowdown, boiler blowdown, and ion exchange regeneration wastewaters. In addition, stormwater may be diverted from Outfall 002. Prior to mixing with the wastewater treated in the biological treatment facility, the boiler blowdown and ion exchange regeneration wastewater are neutralized to a pH between 6 and 9 in one of two neutralization basins. The remaining non-process wastewaters, such as cooling tower blowdown, are not typically treated prior to discharge to the sump upstream of Outfall 001.

Additions with PO/TBA Project

The existing wastewater treatment system is being upgraded to efficiently treat the new wastewater generated from the PO/TBA plant along with the existing site wastewater. The PO/TBA wastewater characteristics are similar and compatible as the PO product is currently being produced from the PO/SM units, and TBA is presently handled as an intermediate product in the MTBE/ETBE unit.

The PO/TBA wastewater streams will be routed directly to a new equalization (EQ) tank located in the PO/TBA plant and subsequently pumped across the site to one new aeration tank, which will be constructed in the existing wastewater treatment unit.

The new aeration tank will be sized to match the existing aeration tank volumes and will have a jet aeration/mixing system with recirculation pumps and aeration blowers similar to the existing system. This will maximize the mixed liquor suspended solids concentration with all three tanks online and if needed, allow the site production units to continue operating with one aeration tank offline. An increased quantity of supplemental nitrogen and phosphorus will be dosed into the combined wastewater to provide for the increased organic loading from the PO/TBA wastewater. The new aeration tank will be covered to collect the off-gas for treatment.

Because of the added chemical oxygen demand (COD) load with the PO/TBA wastewaters, it is expected that more heat will be generated from the biological reactions in the activated sludge units, so a heat exchanger will be added to the new aeration tank, similar to the existing exchangers. There will also be a new stand-alone 3,000-gallon per minute (gpm) cooling tower.

Flow will be gravity-fed from the aeration tank to a new degas tank with a mechanical mixer. From the degas tank, the mixed liquor will flow by gravity into the new clarifier where the biomass and other solids will settle and be separated from the mixed liquor by gravity. The new clarifier will be equipped with a polymer feed system for the increased flow and solids loading.

The effluent from the new clarifier and the two existing clarifiers will flow through the effluent weir box and combine in the new sand filter feed sump. The effluent will then be pumped into four new continuously backwashing sand filters. The sand filters will further remove total suspended solids (TSS) from the clarified effluent prior to discharge. The sand filter effluent will flow by gravity to Outfall 001 for discharge. The backwash water from the sand filters will be collected in a new backwash tank and pumped to the existing digestor.

In addition to the PO/TBA wastewaters being routed to existing wastewater treatment unit, contaminated stormwater, utility wastewaters, and miscellaneous authorized streams generated from the new PO/TBA plant will be routed to a new stormwater tank located within the PO/TBA plant area. This stormwater tank will be designated specifically for first-flush stormwater and contaminated non-process wastewaters where they will be collected and transferred to the new PO/TBA equalization tank, and then to the wastewater treatment unit.

Stormwater Outfalls

Outfall 002

Outfall 002 is primarily a stormwater outfall. Other wastewaters that may be discharged include utility wastewaters, hydrostatic test water, service water, water from maintenance activities, water from the landfarm, and de minimis wastewaters from spill cleanups. Specific utility wastewaters are listed in Table 2. The total area drained through Outfall 002 is 221.75 acres. Outfall 002 discharges through a 2.5-foot Cipolletti (trapezoidal) weir to an on-site ditch (the same as Outfall 001), thence to Harris County Flood Control Ditch (HCFCD) ditch G103-02-03, thence to Bear Lake, which is part of San Jacinto River Tidal (Segment No. 1001). Discharge volume is calculated by rainfall amount and run-off coefficient rather than an instantaneous weir reading.

Outfall 002 discharges stormwater from the eastern portion of the plant including the PO/SM I, EB I, PEA, Polyols, MTBE/ETBE/HPIB, and BDO manufacturing units through various sumps, the former fire training field, and the East Maintenance Area. Stormwater from inactive cells in the on-site landfarm may be routed to either the wastewater treatment unit or to Outfall 002.

The process units each have systems to collect and contain potentially contaminated stormwater. The areas within the process units containing unit operations with the potential to contaminate stormwater runoff have been segregated by curbs from the stormwater system. Stormwater that is potentially

contaminated and first-flush stormwater is contained and routed to the biological treatment system. Additional stormwater may be contained in stormwater sumps (all units) and retention tanks (PO/SM I, EB I, PEA, Polyols, and MTBE/ETBE/HPIB units) prior to determining final disposition of the stormwater. Based on internal assessment, the water may be released to the stormwater system or routed to the biological treatment facility.

Stormwater from non-process areas is collected in a series of concrete stormwater ditches. The ditches are equipped with gates that allow for the segregation of stormwater from various areas of the facility. When contamination of stormwater is suspected, the ditch gates can be closed to contain the stormwater and prevent it from commingling with uncontaminated stormwater. The stormwater contained in the ditch may then be sampled and analyzed prior to discharge or rerouting to the biological treatment facility or to Outfall 001.

Outfall 003

Outfall 003 is primarily a stormwater outfall. Other wastewaters that may be discharged include utility wastewaters, hydrostatic test water, service water, water from maintenance activities, and de minimis wastewaters from spill cleanups. Specific utility wastewaters are listed in Table 2. The total area drained through Outfall 003 is 69.2 acres. Outfall 003 discharges through a 90° V-notch weir into two stormwater detention areas in series, which were required by the HCFCD to reduce the rate of flow before release into HCFCD ditch G103-02-03. The discharge then flows to Bear Lake, which is part of San Jacinto River Tidal (Segment No. 1001).

Outfall 003 discharges uncontaminated stormwater collected from the PO/SM II and EB II manufacturing units through various sumps. The PO/SM II and EB II process units have a system to collect and contain potentially contaminated stormwater. The areas within the process units that contain unit operations with the potential to contaminate stormwater have been segregated by curbs from the stormwater system. Stormwater that is potentially contaminated is contained and routed to the biological treatment system. Additional stormwater is contained in stormwater sumps, designated stormwater retention tanks, or a stormwater retention pond (BDO unit) prior to determining final disposition of the stormwater. Based on analytical results, the water may be released to the stormwater system or routed to the biological treatment facility.

Uncontaminated stormwater from outside the curbed areas is not contained, but flows through a series of concrete stormwater ditches to the outfall. The ditches are equipped with gates to allow for segregation of stormwater in the event contamination is suspected. The stormwater may then be sampled and analyzed prior to discharge or rerouting to the biological treatment facility.

Outfall 004

Outfall 004 is primarily a stormwater outfall. Other wastewaters that may be discharged include utility wastewaters, hydrostatic test water, service water, water from maintenance activities, and de minimis wastewaters from spill cleanups. Specific utility wastewaters are listed in Table 2. The total area drained through Outfall 004 is 15.61 acres. Outfall 004 discharges through a 60° V-notch weir via a 48-inch pipe into an on-site ditch, thence to HCFCD ditch G103-02-03, thence to Bear Lake, which is

part of San Jacinto River Tidal (Segment No. 1001).

Outfall 004 discharges stormwater collected from the warehouse and concrete slabs where the former administration buildings were located north of the PO/SM II complex. The administration buildings were demolished in December 2019, after a new administration building was constructed at the North Plant. What remains from the South Plant administration buildings are the concrete slabs and warehouses.

Outfalls 005 and 006

Outfalls 005 and 006 are primarily stormwater outfalls. Other wastewaters that may be discharged include utility wastewaters, hydrostatic test water, service water, water from maintenance activities, and de minimis wastewaters from spill cleanups. Specific utility wastewaters are listed in Table 2. The total area drained by the two outfalls is 68.6 acres. Each outfall receives approximately half of the runoff from the area. Outfall 005 discharges through a 60° V-notch weir into a 54-inch pipe. Outfall 006 discharges through a 90° V-notch weir into a 48-inch pipe. Both outfalls flow into HCFCD ditch G103-02-03, thence to Bear Lake, which is part of San Jacinto River Tidal (Segment No. 1001).

Outfalls 005 and 006 discharge stormwater from the area west of the PO/SM II complex. This area contains the two PO/SM II process flares, a maintenance laydown area, warehouses, office buildings, and parking areas.

Proposed Outfalls 008, 009, and 010

Outfalls 008, 009, and 010 were added to the TPDES permit in 2017 as proposed outfalls associated with the future PO/TBA manufacturing unit. The unit is now currently under construction and Outfalls 008 and 009 are expected to be started up in 2022. Outfall 010 has not been constructed and may not be needed, but Lyondell wishes to retain it in the permit in case the need arises.

All three outfalls are authorized in the current TPDES permit to discharge stormwater, utility wastewaters, hydrostatic test water, service water, water from maintenance activities, and de minimis wastewaters from spill cleanups. Specific utility wastewaters are listed in Table 2. Outfall 008 is also authorized to discharge cooling tower blowdown and this TPDES application includes an amendment request to add boiler blowdown and cooling tower and boiler maintenance wastewaters.

Outfall 008 will discharge from the future Pond 3 into an on-site ditch, thence to HCFCD ditch G103-02-03, thence to Bear Lake, which is part of San Jacinto River Tidal (Segment No. 1001). Outfall 009 will discharge from the future Pond 1/2 system into an unnamed ditch, thence to Bear Lake. Outfall 010, if it were constructed, would likely discharge into a roadside ditch along Wallisville Road, thence to Bear Lake.

The TCEQ has exempted Ponds 1, 2, and 3 from the liner requirements in Other Requirement No. 4 of the current TPDES permit. This requirement specifies that before any new pond that will receive only non-process wastewater is placed in service, that a determination be obtained from the TCEQ whether the pond must be lined. Lyondell submitted a request for liner determination on October 11,

2018 and the TCEQ approved the liner exemption by letter on February 4, 2019.

Two new stormwater tanks will be located in the PO/TBA unit to manage post-first-flush, non-contaminated stormwater. Water in the tanks will be tested and if found to meet the stormwater discharge limits, will be drained to a stormwater ditch and discharged via Outfall 008. Water that does not meet stormwater discharge limits will be routed to the wastewater treatment unit via the new equalization tank.

Outfall 008 will drain the majority of the PO/TBA unit stormwater, cooling tower blowdown, boiler blowdown, and utility wastewaters. Normally boiler blowdown will be routed to the cooling tower recirculation line via cooling tower circulation pumps, and as such, will become part of the cooling tower blowdown. During initial startup of the PO/TBA unit, however, the boilers will be started up first, resulting in boiler blowdown discharging to Outfall 008 directly instead of routing to the cooling tower. Once both the boiler and cooling tower systems are running, the boiler blowdown will be routed to the PO/TBA cooling tower recirculation line. However, there may be times, for example, during maintenance or repair, that the boiler blowdown would need to be routed directly to the outfall.

With the inclusion of cooling tower blowdown, the discharge from Outfall 008 will be continuous. Outfall 008 will discharge from Pond 3 on the south side of the PO/TBA plant into an on-site ditch, which then flows into HCFCD ditch G103-02-03.

Non-process areas located in the southeastern and northeastern sections of the PO/TBA unit will discharge through Outfall 009. The discharge from the outfall will be intermittent and variable. The future detention Ponds 1 and 2 will be interconnected and Outfall 009 will discharge from Pond 2. Outfall 009 will discharge to an on-site ditch, thence to an unnamed ditch and into Bear Lake.

SANITARY WASTEWATER

Sanitary sewage is normally routed to Harris County Water Control and Improvement District (WCID) No. 84 wastewater treatment facility (TPDES WQ0010558001). Sewage may also be sent to the adjacent Equistar Channelview North Complex for treatment and discharge authorized under TPDES WQ0000391000. Some domestic wastewater may be collected in on-site portable toilets during construction/maintenance work and transported off-site for treatment.

WATER SUPPLY

Water used for industrial purposes at Lyondell Channelview is supplied from Lake Houston. The City of Houston owns 100% of Lake Houston and the Coastal Water Authority (CWA) manages Lake Houston.[5] The intake structure at Lake Houston is controlled and operated by CWA. The City is also a public water system (PWS) with ID TX1010013.

Water from CWA is pumped into a canal system that leads to the adjacent Equistar Chemicals Channelview North Complex. The water from the canal is pumped to a surface water treatment unit

[5] https://www.publicworks.houstontx.gov/pud/drinkingwater.html

where the water is filtered and clarified before being pumped to Lyondell Channelview for use in the manufacturing process. Periodically, the water from Lake Houston may have elevated copper levels, which is monitored at the entry and exit to the surface water treatment unit. Currently, the CWA is implementing the Luce Bayou Interbasin Transfer Project, which will transfer water from the Trinity River to Lake Houston via a canal system to meet the increased demand for surface water by municipalities and industry within Harris County. This project is scheduled to be completed in 2021.

Lyondell Channelview obtains potable water from the Harris County WCID No. 84.

EFFLUENT GUIDELINES

National effluent guidelines for the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) industry at 40 CFR 414 are applicable to process wastewaters currently discharged through Outfall 001, as well as the additional process wastewaters from the PO/TBA project that will be discharged through Outfall 001. Specific applicable OCPSF guidelines are Subpart F Commodity Organic Chemicals, Subpart G Bulk Organic Chemicals, Subpart H Specialty Organic Chemicals, and Subpart I Direct Discharge Point Sources That Use End-of-Pipe Biological Treatment. Process production percentages and wastewater flow rates are given in Tables 3-1 and 3-2.

Wastewaters received from the Optim co-generation unit, the HTC R&D facility, Equistar Pipeline, and Equistar Chemicals are not subject to 40 CFR 437 Centralized Waste Treatment effluent guidelines because they are either routed to the Lyondell Channelview wastewater system via conduit (40 CFR 437.1(b)(3)) and/or they are similar and compatible with Lyondell Channelview wastewaters and treatment system (40 CFR 437.1(b)(2)).

Optim's co-generation facility does not send wastewaters covered by effluent guidelines at 40 CFR 423, Steam Electric Power Generating, to Lyondell Channelview's wastewater system. Optim discharges its other wastewaters under its own TPDES Permit WQ0002845000.

Table 1. Raw Materials, Intermediates, and Final Products

Raw Materials	Intermediates	Final Products
Benzene (71-43-2)	Acetone (67-64-1)	Allyl Alcohol (107-18-6)
Caustic Soda (1310-73-2)	Acetophenone (98-86-2)	1,4-Butanediol (110-63-4)
Ethylene (74-85-1)	Ethylbenzene (100-41-4)	Ethyl Tertiary Butyl Ether (ETBE) (637-92-3)
Ethylene Oxide (75-21-8)	Ethylbenzene Hydroperoxide (N/A)	Isobutylene (115-11-7)
Glycerol (56-81-5)	Isobutylene (115-11-7)	2-Methyl-1,3-Propanediol (2163-42-0)
Hexane (110-54-3)	α-Methylbenzyl Alcohol (98-85-1)	Methyl Tertiary Butyl Ether (1634-04-4)
Hydrogen (1333-74-0)	Mixed C4-C5-C6 stream (N/A)	N-Methylpyrrolidone (872-50-4)
Methanol (67-56-1)	Propane (74-98-6)	N-Propanol (71-23-8)
Methylamine (74-89-5)	Tertiary Butyl Alcohol (75-65-0)	Phenylethyl Alcohol (60-12-8)
Mixed Butanes (106-97-8, 75-28-5)		Polyols (N/A)
Monomethylamine (74-89-5)		Propylene Oxide (75-56-9)
Oxygen (7782-47-7)		Styrene Monomer (100-42-5)
Potassium Hydroxide (1310-58-3)		Tertiary Butyl Alcohol (75-65-0)
Propylene (115-07-1)		Tetrahydrofuran (109-99-9)
Toluene (108-88-3)		

Table 2. Wastewater Sources by Outfall

Source	Outfall									
	001	002	003	004	005	006	007	008	009	010
Process wastewater	x									
Barge Dock wastewater	x									
Hydrostatic test water	x[6]	x	x	x	x	x		x	x	x
Laboratory wastewater	x									
Cooling tower and boiler blowdown	x							ADD[8]		
Cooling tower and boiler maintenance wastewaters	ADD							ADD		
Loading area and process area washdown	x									
Tank farm wastewater	x									
Heat exchanger blasting slab wastewater [9]	MOD									
Demineralization/ion exchange regeneration blowdown [10]	MOD									
Maintenance wastewater	x	x	x	x	x	x		x	x	x
Steam condensate and blowdown	x									
Groundwater [4]	x									
Stormwater	MOD[1]	x[2]	x	x	x	x		x	x	x
Construction stormwater	ADD	x	x	x	x	x	x[5]	x	x	x
Water treatment wastewaters	ADD									
Water from landfarm [7]	ADD	ADD								
Utility wastewater [3]	ADD	x	x	x	x	x	x	x	x	x
Service water		x	x	x	x	x	x	x	x	x
De minimis spill cleanup water		x	x	x	x	x	x	x	x	x

Notes

x Listed in TPDES permit issued 1-11-2017

ADD Amendment request to add wastewater to existing outfall

MOD Amendment request to modify wastewater description.

[1] Stormwater including, but not limited to, from production units, landfarm, and adjacent co-generation facility.

[2] Stormwater including, but not limited to, from production units and landfarm.

[3] Utility wastewater includes, but is not limited to: potable water, vehicle rinse water, firewater (which has not come into direct contact with raw material, intermediate product, finished product, by-product, or waste product and is not the result of a fire), hydrotest water, clarified water, demineralized water, steam condensate and blowdown, non-contact once-through cooling water, de minimis amounts of cooling tower water, raw and well water, groundwater seepage, condensate, and analyzer instrumentation drain wastewater.

[4] Groundwater from monitoring and recovery wells (on-site and off-site)

[5] Storm water associated with construction activities from a concrete batch plant

[6] Hydrostatic test water includes water from Equistar Pipeline Operations.

[7] Water from landfarm is mostly stormwater, but can include supernate from wastewater treatment solids.

[8] Add boiler blowdown. Normally boiler blowdown will be routed to the cooling tower as makeup water, but may be discharged directly to the outfall.

[9] Change description in permit from heat exchanger blasting slab waste to heat exchanger blasting slab wastewater.

[10] Add ion exchange to demineralizer regenerant blowdown.

Table 3-1. Wastewater Flows by Outfall (Interim Phase without PO/TBA)

Outfall	Wastewater Sources	Maximum Monthly Average		Flow % by Wastewater Source	Applicable Effluent Guideline (EGL)[1] and Percent of Production
		gpd	MGD		
001	Process wastewater and stormwater (total)		1.161	36.2%	40 CFR 414, Subpart F (30%) 40 CFR 414, Subpart G (22%) 40 CFR 414, Subpart H (48%)
	Process Wastewater				
	PO/SM-I, EB-1, and PEA Unit Complex	360,000			
	PO/SM-II and EB-II Unit Complex	180,000			
	MTBE/ETBE/HPIB Unit	360,000			
	Polyols Unit [3]	72,000			
	Butanediol Unit	72,000			
	Water from landfarm	57,600			
	Clarifier sludge to digester	(79,200)			
	Stormwater [2]				
	Stormwater, potentially contaminated	210,300			
	Utility wastewater (total)		2.045	63.8%	N/A
	Cogen	28,800			
	Cooling tower blowdown	1,440,000			
	Boiler blowdown, demin/ion exchange wastewaters	576,000			
	Other miscellaneous flows [5]	variable			
	Domestic wastewater [4]	N/A		0.0%	
	Outfall 001 Total		3.206	100%	
002	Stormwater	Intermittent and variable			N/A
	Construction stormwater				
	Water from landfarm				
	Utility wastewater				
	Hydrostatic test water				
	Service water				
	Water from maintenance activities				
	De minimis quantities from spill cleanups				
003, 004, 005, 006	Stormwater	Intermittent and variable			N/A
	Construction stormwater				
	Utility wastewater				
	Hydrostatic test water				
	Service water				
	Water from maintenance activities				
	De minimis quantities from spill cleanups				
007	Stormwater associated with construction activities from a concrete batch plant	Intermittent and variable			

Notes

[1] 40 CFR 414, Subpart F - Organic Chemicals, Plastics, and Synthetic Fibers, Commodity Organic Chemicals
40 CFR 414, Subpart G - Organic Chemicals, Plastics, and Synthetic Fibers, Bulk Organic Chemicals
40 CFR 414, Subpart H - Organic Chemicals, Plastics, and Synthetic Fibers, Specialty Organic Chemicals

[2] Stormwater that is potentially contaminated. For purpose of EGL allocations, considered equivalent to process wastewater.

[3] Normal flow is to deepwell, but may be routed to wastewater treatment system. Flow is not included in total Outfall flow shown here.

[4] Sanitary sewage is normally routed to Harris County WCID No. 84 wastewater treatment facility (TPDES WQ0010558001). Sewage may also be sent to the adjacent Equistar Channelview North Complex for treatment and discharge authorized under TPDES WQ0000391000.

[5] Other miscellaneous flows, see Table 2 Wastewater Sources by Outfall.

N/A Not applicable

Table 3-2. Wastewater Flows by Outfall (Final Phase with PO/TBA)

Outfall	Wastewater Sources	Maximum Monthly Average		Flow % by Wastewater Source	Applicable Effluent Guideline (EGL)[1] and Percent of Production
		gpd	MGD		
001	Process wastewater and stormwater (total)		1.755	46.2%	40 CFR 414, Subpart F (31%) 40 CFR 414, Subpart G (36%) 40 CFR 414, Subpart H (33%)
	Process Wastewater				
	PO/SM-I, EB-1, and PEA Unit Complex	360,000			
	PO/SM-II and EB-II Unit Complex	180,000			
	MTBE/ETBE/HPIB Unit	360,000			
	Polyols Unit [3]	72,000			
	Butanediol Unit	72,000			
	PO/TBA Unit [4]	218,000			
	Water from landfarm	57,600			
	Clarifier sludge to digester	(118,800)			
	Stormwater [2]				
	Stormwater, potentially contaminated	210,300			
	PO/TBA stormwater, potentially contaminated [4]	415,600			
	Utility wastewater (total)		2.045	53.8%	N/A
	Cogen	28,800			
	Cooling tower blowdown	1,440,000			
	Boiler blowdown, demin/ion exchange wastewaters	576,000			
	PO/TBA cooling tower blowdown [4,5]	380,160			
	Other miscellaneous flows [7]	variable			
	Domestic wastewater [6]	N/A		0.0%	
	Outfall 001 Total		3.80	100%	
002	Stormwater	Intermittent and variable			N/A
	Construction stormwater				
	Water from landfarm				
	Utility wastewater				
	Hydrostatic test water				
	Service water				
	Water from maintenance activities				
	De minimis quantities from spill cleanups				
003, 004, 005, 006, 009, 010	Stormwater	Intermittent and variable			N/A
	Construction stormwater				
	Utility wastewater				
	Hydrostatic test water				
	Service water				
	Water from maintenance activities				
	De minimis quantities from spill cleanups				
007	Stormwater associated with construction activities from a concrete batch plant	Intermittent and variable			
008	Cooling tower and boiler blowdown [5]	380,160	Continuous and flow-variable		N/A
	Cooling tower and boiler maintenance wastewaters	Intermittent and variable			
	Stormwater				
	Construction stormwater				
	Utility wastewater				
	Hydrostatic test water				
	Service water				
	Water from maintenance activities				
	De minimis quantities from spill cleanups				

Notes

[1] 40 CFR 414, Subpart F - Organic Chemicals, Plastics, and Synthetic Fibers, Commodity Organic Chemicals
40 CFR 414, Subpart G - Organic Chemicals, Plastics, and Synthetic Fibers, Bulk Organic Chemicals
40 CFR 414, Subpart H - Organic Chemicals, Plastics, and Synthetic Fibers, Specialty Organic Chemicals

[2] Stormwater that is potentially contaminated. For purpose of EGL allocations, considered equivalent to process wastewater.

[3] Normal flow is to deepwell, but may be routed to wastewater treatment system. Flow is not included in total Outfall flow shown here.

[4] Wastewaters from future PO/TBA Unit

[5] PO/TBA cooling tower blowdown will normally discharge via Outfall 008, so it is not included in the totals for Outfall 001 here.

[6] Sanitary sewage is normally routed to Harris County WCID No. 84 wastewater treatment facility (TPDES WQ0010558001). Sewage may also be sent to the adjacent Equistar Channelview North Complex for treatment and discharge authorized under TPDES WQ0000391000.

[7] Other miscellaneous flows, see Table 2 Wastewater Sources by Outfall.

N/A Not applicable

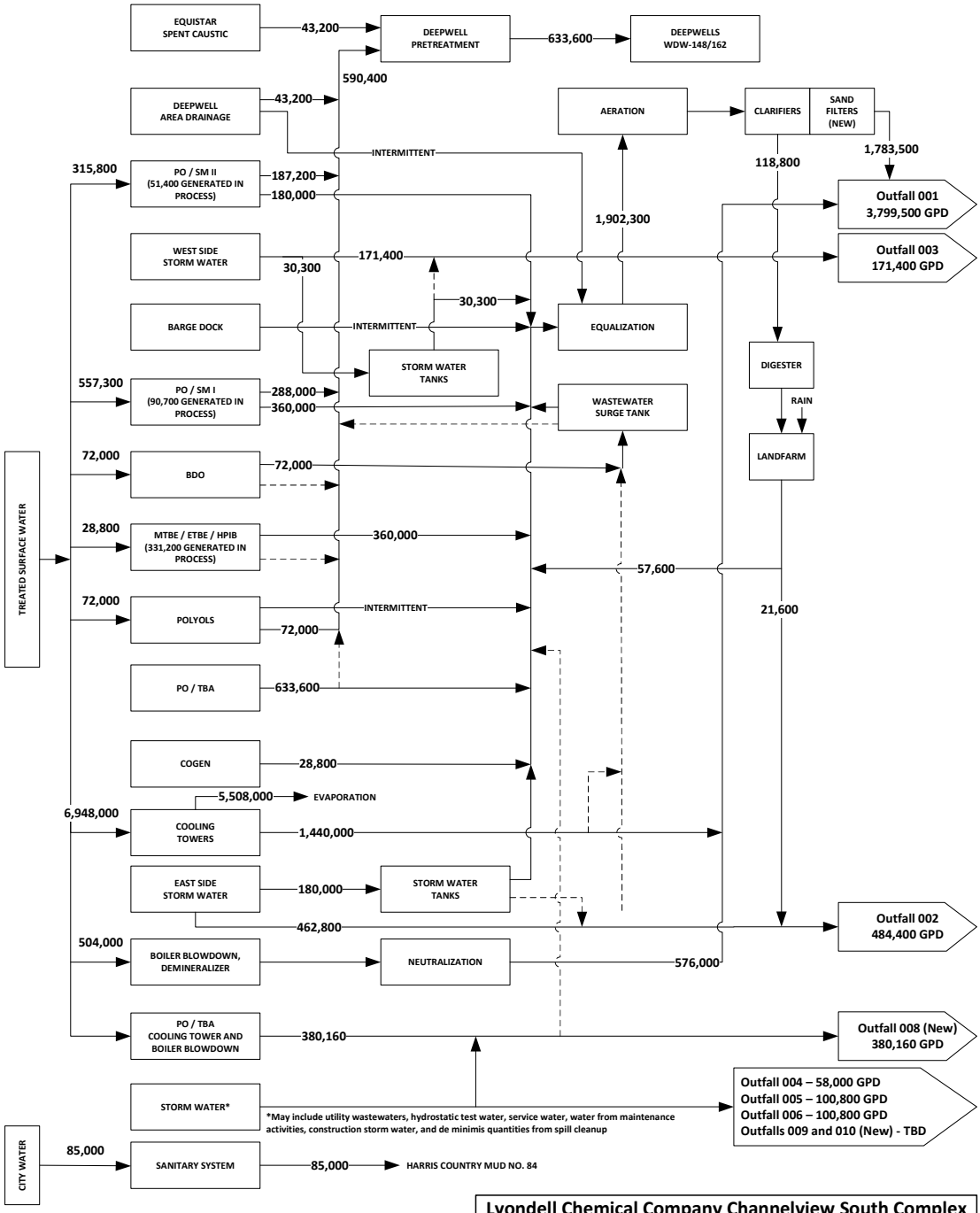
Table 4. Wastewater Treatment Units

Unit	Dimensions	Capacity
PO/SM I Stormwater Surge Tank	24' D x 32' H	0.27 MG
PO/SM I Stormwater Surge Tanks (2)	108' D x 40' H	2.3 MG each
PO/SM II Stormwater Surge Tank	45' D x 48' H	0.5 MG
PO/SM II Stormwater Tanks (2)	70' D x 40' H	1 MG each
BDO Stormwater Pond	96' x 183' x 6' D	0.79 MG
PO/TBA Equalization Tank	50' D x 40' H	0.44 MG
PO/TBA Stormwater Tanks (2)	70' D x 45' H	1.0 MG each
PO/TBA Contaminated Stormwater Tank	63' x 48' H	0.89 MG
Surge Tank	90' D x 40' H	2.1 MG
Equalization Tanks (2)	90' D x 40' H	2.0 MG each
Aeration Tanks (2)	108' D x 40' H	2.4 MG each
Aeration Tank*	108' D x 40' H	2.4 MG
Aeration Tank / Sludge Digester	150' D x 15' H	1.5 MG
Clarifiers (2)	60' D x 10' H	0.211 MG each
Clarifier	60' x 14' H	0.25 MG
Sand Filters (4)	12' x 23' H	470 GPM
Degas Tanks	14' x 16' H	0.018 MG
Sand Filter Sump	16' x 12' H	0.014 MG
Sand Filter Backwash Tank	5' 7" D x 6' H	0.001 MG
Landfarm		27 acres
Sludge Digester	100' x 100' (surface) x 8' D	0.7 MG
Sludge Holding Basin	65' x 65' (surface) x 8' D	0.133 MG
Neutralization Basins (2)	80' x 20'4" x 14'6" D	0.16 MG
Supernate sump	72' x 18' x 17'D	0.165 MG

*This aeration tank will be covered to control emissions from the wastewater. Emissions will be routed to a regenerative thermal oxidizer.

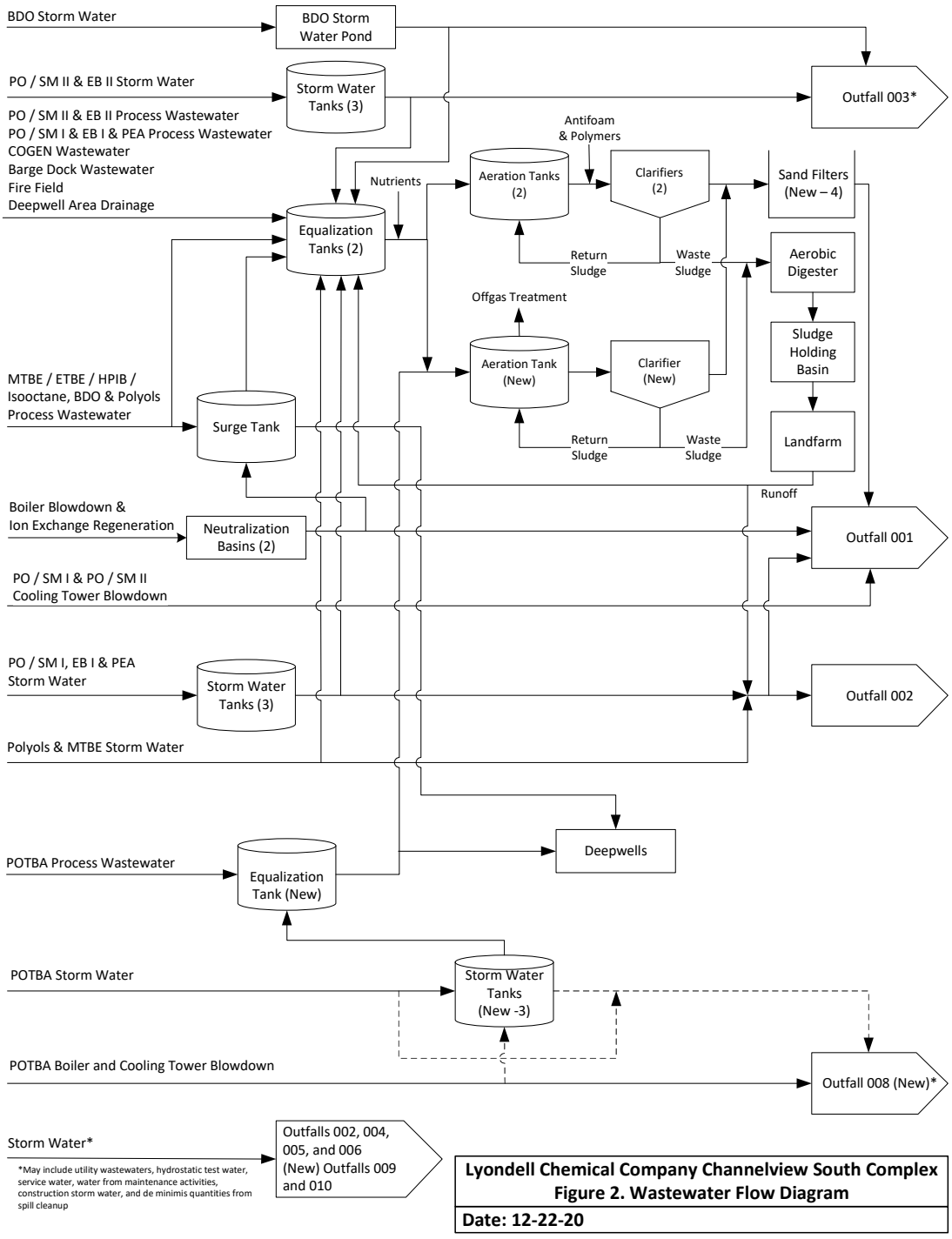
MG - million gallons

GPM - gallons per minute



NOTES
1. FLOWS ARE AVERAGE GPD
2. ALTERNATE FLOW ROUTING (DOTTED)

Lyondell Chemical Company Channelview South Complex
Figure 1. Wastewater Flow Balance
Date: 12-10-20


BDO Storm Water
BDO Storm Water Pond
Outfall 003*
PO / SM II & EB II Storm Water
Storm Water Tanks (3)
PO / SM II & EB II Process Wastewater
PO / SM I & EB I & PEA Process Wastewater
COGEN Wastewater
Barge Dock Wastewater
Fire Field
Deepwell Area Drainage
Antifoam & Polymers
Nutrients
Aeration Tanks (2)
Clarifiers (2)
Sand Filters (New – 4)
Equalization Tanks (2)
Return Sludge
Waste Sludge
Aerobic Digester
Offgas Treatment
Sludge Holding Basin
MTBE / ETBE / HPIB / Isooctane, BDO & Polyols Process Wastewater
Surge Tank
Aeration Tank (New)
Clarifier (New)
Landfarm
Runoff
Boiler Blowdown & Ion Exchange Regeneration
Neutralization Basins (2)
Outfall 001
PO / SM I & PO / SM II Cooling Tower Blowdown
PO / SM I, EB I & PEA Storm Water
Storm Water Tanks (3)
Outfall 002
Polyols & MTBE Storm Water
Deepwells
POTBA Process Wastewater
Equalization Tank (New)
POTBA Storm Water
Storm Water Tanks (New -3)
POTBA Boiler and Cooling Tower Blowdown
Outfall 008 (New)*
Storm Water*
*May include utility wastewaters, hydrostatic test water, service water, water from maintenance activities, construction storm water, and de minimis quantities from spill cleanup
Outfalls 002, 004, 005, and 006 (New) Outfalls 009 and 010
Lyondell Chemical Company Channelview South Complex
Figure 2. Wastewater Flow Diagram
Date: 12-22-20

ATTACHMENT T-2

AMENDMENT REQUESTS
LYONDELL CHEMICAL COMPANY
CHANNELVIEW SOUTH PLANT

AMENDMENT REQUESTS
LYONDELL CHEMICAL COMPANY
CHANNELVIEW SOUTH PLANT

Lyondell Chemical Company (Lyondell) requests the following amendments to TPDES Permit WQ0002927000 for the Channelview South Plant.

1. Use a site-specific hardness for calculation of water quality-based effluent limits.
2. Increase the daily average, daily maximum, and single grab limits for copper for Outfall 001.
3. Remove limits and monitoring for aluminum, zinc, and total xylenes for Outfall 001.
4. Add wastewaters to Outfall 001 - cooling tower and boiler maintenance wastewaters, water treatment wastewaters, construction stormwater, water from landfarm, and utility wastewaters.
5. Modify descriptions of certain wastewaters already authorized for Outfall 001 – heat exchanger blasting slab waste, demineralizer regeneration blowdown, and stormwater.
6. Add water from landfarm to Outfall 002.
7. Increase the daily maximum pH limit for Outfall 002 from 9.0 standard units (SU) to 9.5 SU.
8. Reduce monitoring frequency for Outfalls 002 and 003 for TOC and oil and grease from weekly to once per two weeks.
9. Use site-specific partitioning coefficients for aluminum for Outfalls 003, 004, and 005 for calculating water quality-based effluent limits.
10. Add wastewaters to Outfall 008 – boiler blowdown, cooling tower and boiler maintenance wastewaters.
11. Update the discharge and monitoring locations for Outfalls 008, 009, and 010.
12. Revise the discharge routing description for Outfall 009.
13. Remove Other Requirements Nos. 5, 12, and 14, which have been completed.
14. Update Other Requirement No. 4 related to pond requirements to the newer version now being used by the TCEQ.

SITE-SPECIFIC HARDNESS FOR WATER QUALITY-BASED EFFLUENT LIMITS

Lyondell requests that a site-specific hardness of 147 milligrams per liter (mg/L) (as calcium carbonate, $CaCO_3$) be used for the freshwater drainage ditches in the calculation of water quality-based effluent limits (WQBELs) for all outfalls.

The site-specific value was developed from a study that Lyondell completed in 2000. It chose a Harris County Flood Control District (HCFCD) drainage ditch upstream of the Channelview South Plant outfalls to be a representative stream close to the facility. The work plan for the study was approved by Ms. Lynda Clayton in 1999, the study results were submitted to Mr. Chris Linendoll in 2000, and the permit writer, Ms. Yvonna Pierce (now Miramontes), incorporated the site-specific value in the 2001 permit fact sheet. In later permit renewals, the TCEQ used Segment 1016 (Greens Bayou Above Tidal) as a default representative stream for hardness values instead, but did not state why the site-specific hardness was not used. Given that the TCEQ had approved the site-specific hardness, it may have been a simple oversight that it was not carried forward. Lyondell believes that the HCFCD ditch used to develop the site-specific 147 mg/L value is more representative than Segment 1016 because it is closer to the facility.

INCREASE COPPER LIMITS FOR OUTFALL 001

If the TCEQ agrees to use the site-specific hardness described above, it will increase the WQBELs for those metals that have hardness-dependent water quality standards. Although WQBELs for several metals would be increased, only the permit limits for copper for Outfall 001 would be affected because other factors control the permit limits for other Outfall 001 metals (aluminum, chromium, zinc).

Lyondell requests that the permit limits for copper be increased based on the site-specific hardness. Lyondell has estimated these permit limits from the WQBEL concentrations (0.0429 mg/L daily average, 0.0908 mg/L daily maximum) and permitted flows (interim phase before completion of PO/TBA unit: 3.2 million gallons per day, MGD; final phase after PO/TBA: 3.8 MGD) as follows: interim phase – 1.14 pounds per day (lb/d) daily average, 2.42 lb/d daily maximum; and final phase – 1.36 lb/d daily average and 2.88 lb/d daily maximum. Lyondell's estimate for the increased single grab limit is 0.181 mg/L, based on 2 times the daily maximum WQBEL concentration of 0.0908 mg/L.

Lyondell believes that increasing the copper limits at Outfall 001 would be compliant with anti-backsliding provisions. An exception to anti-backsliding for a permit condition based on a state standard is allowed under the Clean Water Act (CWA) where the permit change meets one of the exceptions listed at CWA §402(o)(2) and where the change will comply with the water quality standard and be consistent with any applicable effluent guideline (CWA §402(o)(3)).[1] This change would meet the anti-backsliding exception at §402(o)(2)(B)(i), new information, in this case, a site-specific hardness value. The new limits, being based on WQBELs, demonstrate that water quality standards would be maintained and be consistent with antidegradation policy. The WQBEL limits are more stringent than limits based on applicable effluent guidelines at 40 CFR 414.91 and therefore are consistent with the guidelines.

[1] U.S. Environmental Protection Agency NPDES Permit Writers' Manual, EPA-833-K-10-001, September 2010, Section 7.2, "Applying Anti-backsliding Requirements."

REMOVE LIMITS AND MONITORING FOR ALUMINUM, ZINC, AND XYLENES FOR OUTFALL 001

Lyondell requests removal of limits and monitoring for aluminum and zinc for Outfall 001 because levels in the discharge are well below the WQBELs. The TCEQ's policy is to require monitoring if the average concentration in the discharge is more than 70% of the daily average WQBEL, and permit limits if the average is more than 85% of the WQBEL.

For aluminum, the average of the four sample analyses submitted with the permit application is 0.078 mg/L, which is less than 10% of the daily average WQBEL (0.834 mg/L). The permit has mass limits for aluminum for Outfall 001 and requires an annual analysis; the highest value in the last three years was 1.6 lb/d, which is well below both the daily average limit for the interim phase (22.2 lb/d) and final phase (26.4 lb/d).

For zinc, the average of the four sample analyses submitted with the permit application is 0.016 mg/L, which is less than 7% of the daily average WQBEL (0.235 mg/L). The permit has mass limits for zinc for Outfall 001 and requires an annual analysis; the highest value in the last three years was 0.4 lb/d, which is well below both the daily average limit for the interim phase (6.29 lb/d) and final phase (7.47 lb/d).

Lyondell requests the removal of monitoring and limits for total xylenes for Outfall 001 because analyses of the last three annual samples required by the permit have shown no detectable levels in the discharge.

Lyondell believes that removing limits for aluminum, zinc, and total xylenes at Outfall 001 would be compliant with anti-backsliding provisions. An exception to anti-backsliding for a permit condition based on a state standard is allowed under the Clean Water Act (CWA) where the permit change meets one of the exceptions listed at CWA §402(o)(2) and where the change will comply with the water quality standard and be consistent with any applicable effluent guideline (CWA §402(o)(3)). This change would meet the anti-backsliding exception at §402(o)(2)(B)(i), new information, in this case, new effluent data. Effluent data showing levels below WQBELs (aluminum, zinc) or nondetected (xylenes) demonstrate that water quality standards would be maintained and be consistent with antidegradation policy. There are no effluent guidelines for aluminum, zinc, or total xylenes applicable to Outfall 001.

ADD WASTEWATERS TO OUTFALL 001

Lyondell requests the addition of the following wastewaters to Outfall 001. These additional wastewaters are also listed in Table 2 Wastewater Sources by Outfall in Attachment T-1 Facility Description.

- Cooling tower and boiler maintenance wastewaters
- Water treatment wastewaters
- Construction stormwater

- Water from landfarm (mostly stormwater, but can include supernate from wastewater treatment solids)
- Utility wastewaters – Utility wastewaters to add are those listed in Other Requirement No. 13 of the current permit. Utility wastewaters listed in Other Requirement No. 13 include, but are not limited to: potable water, vehicle rinse water, firewater (which has not come into direct contact with raw material, intermediate product, finished product, by-product, or waste product and is not the result of a fire), hydrotest water, clarified water, demineralized water, steam condensate and blowdown, non-contact once-through cooling water, de minimis amounts of cooling tower water, raw and well water, groundwater seepage, condensate, and analyzer instrumentation drain wastewater.

MODIFY WASTEWATER DESCRIPTIONS FOR OUTFALL 001

Lyondell requests modification of the description of certain wastewaters that are currently authorized for Outfall 001. These modifications are also listed in Table 2 Wastewater Sources by Outfall in Attachment T-1 Facility Description.

- Change heat exchanger blasting slab waste to heat exchanger blasting slab wastewater.
- Include ion exchange demineralizer regeneration blowdown with demineralizer regeneration blowdown.
- Modify stormwater to include, but not be limited to, from production units, landfarm, and adjacent cogeneration facility.

ADD WASTEWATER TO OUTFALL 002

Lyondell requests the addition of the following wastewater to Outfall 002.

- Water from landfarm (mostly stormwater, but can include supernate from wastewater treatment solids).

INCREASE pH FOR OUTFALL 002

Lyondell requests an increase in the daily maximum pH limit for Outfall 002 from 9.0 SU to 9.5 SU. Outfall 002 discharges primarily stormwater, but is also authorized to discharge construction stormwater, utility wastewater, hydrostatic test water, service water, water from maintenance activities, and de minimis quantities from spill cleanup.

The higher pHs seen in the outfall discharges are believed to be caused by algae growth in the open ditch system. Algal photosynthetic activity can temporarily increase the pH over 9.0 SU during daylight hours, particularly during warmer periods that promote algal growth. Algae use carbon dioxide as a carbon source for growth during photosynthesis. Carbon dioxide in water produces carbonic acid. When carbon dioxide is reduced, carbonic acid is also reduced and the pH increases. Outfall 002 discharges when there is a high enough rainfall. Between discharges there will be some residual water in the ditches and also, the ditch gates may be closed at times to

temporarily retain waters; consequently, algae can grow in the water that remains in the ditches between outfall discharges.

The TPDES permit requires that the Outfall 002 pH be measured within the first hour of discharge. Because rainwater typically has a pH below 7 SU, it would be expected that the first-hour pH would be higher if stormwater is pushing through residual ditch water having a higher pH, and that the pH would decrease in the outfall discharge afterward.

Outfall 002 discharges into an on-site ditch that also receives the discharge from Outfall 001, the main process wastewater outfall. Because Outfall 002 is only about 35 feet upstream of where the Outfall 001 discharge pipe enters the ditch, mixing of the two flows is almost immediate (see outfall photos in Attachment A-5 Outfall Photos). On average, the Outfall 001 daily maximum pH is lower than Outfall 002, which helps moderate any higher pH flows from Outfall 002. (Based on monitoring data July 2017 – July 2020, the median of the Outfall 001 daily maximum pHs was 7.9 compared to 8.2 for Outfall 002.) The ditch carrying the flows from Outfalls 001 and 002 drains into Harris County Flood Control District ditch G103-02-03, which flows downstream into Bear Lake, part of San Jacinto River Tidal (Segment No. 1001).

In 2019 when Lyondell first considered amending the permit to increase the Outfall 002 pH limit, it contacted Peter Schaefer of the TCEQ to determine the feasibility of approving the change because as Team Leader for water quality Standards Implementation, Mr. Schaefer oversees receiving water assessments such as pH evaluations. Mr. Schaefer's opinion was that the change could be approved and he based this on the TCEQ's pH screening procedures. He explained that the screening was based on the first classified receiving water for the outfall (Bear Lake section of San Jacinto River Tidal) because the TCEQ does not typically require assessments of unclassified waters such as the HCFCD ditch.

Lyondell believes that increasing the daily maximum pH limit at Outfall 002 would be compliant with anti-backsliding provisions. An exception to anti-backsliding for a permit condition based on a state standard is allowed under the Clean Water Act (CWA) where the permit change meets one of the exceptions listed at CWA §402(o)(2) and where the change will comply with the water quality standard and be consistent with any applicable effluent guideline (CWA §402(o)(3)). This change would meet the anti-backsliding exception at §402(o)(2)(B)(i), new information, in this case, new pH screening. The TCEQ's pH screening would demonstrate that water quality standards would be maintained and be consistent with antidegradation policy. There are no effluent guidelines for pH applicable to Outfall 002 because it does not discharge any process wastewater.

REDUCE MONITORING FREQUENCY FOR OUTFALLS 002 AND 003 FOR TOC AND OIL AND GREASE

Lyondell requests a reduction in sampling frequency for Outfalls 002 and 003 for total organic carbon (TOC) and oil and grease from weekly to once per two weeks. The lower monitoring frequency would be consistent with the TCEQ's *Guidance Document for Establishing Monitoring Frequencies for Domestic and Industrial Wastewater Discharge Permits* (Document

No. 98-001.000-OWR-WQ, May 1998). This request is supported by Lyondell's good compliance history as shown below in the summary of discharge monitoring report (DMR) data for the July 2017 – July 2020 period. It is noted for Outfall 002 that there was one exceedance of the TOC limit in February 2018 (108 mg/L); however, the next highest value in this 3-year period was 34 mg/L, well below the permit limit of 75 mg/L.

DMR Monitoring Data (July 2017 – July 2020)				
	Outfall 002		Outfall 003	
	TOC (mg/L)	O&G* (mg/L)	TOC (mg/L)	O&G* (mg/L)
Minimum	4	5	4	5
Maximum	108	5	27	5
Average	18	5	11	5
Permit Limit	75	15	75	15
*Actual analytical results for oil and grease are typically non-detect at a detection limit of 5 mg/L, but are reported as equal to 5 mg/L in the DMR. mg/L – milligrams per liter				

ALUMINUM PARTITION COEFFICIENT FOR OUTFALLS 003, 004, AND 005

Lyondell requests that the TCEQ use site-specific partitioning coefficients for aluminum for Outfalls 003, 004, and 005 for calculating WQBELs. Other Requirement No. 14 of the current TPDES permit required Lyondell to develop a work plan for an aluminum partitioning coefficient study for these three outfalls and to submit the study results. Lyondell submitted the study results to the TCEQ on December 21, 2020.

ADD WASTEWATERS TO OUTFALL 008

Lyondell requests the addition of the following wastewaters to Outfall 008.

- Boiler blowdown – it will normally be routed to the cooling tower as makeup water, but may be discharged directly to the outfall.
- Cooling tower and boiler maintenance wastewaters.

UPDATE DISCHARGE AND MONITORING LOCATIONS FOR OUTFALLS 008, 009, AND 010

Lyondell requests revisions to the location coordinates and monitoring point descriptions for Outfalls 008, 009, and 010. These outfalls were added to the TPDES permit in 2017 as proposed outfalls associated with a future PO/TBA manufacturing unit. The unit is now currently under construction and Outfalls 008 and 009 are expected to be started up in 2022. Outfall 010 has not been constructed and may not be needed, but Lyondell wishes to retain it in the permit in case the need arises.

Changes in the monitoring point descriptions in the permit for all three outfalls are needed. Construction plans for Outfalls 008 and 009 have modified the outfall locations and monitoring points from what is represented in the permit. Because it is not certain exactly where Outfall 010 would be located if it were constructed, the monitoring point description in the permit needs to be made more general. However, it is expected that Outfall 010 would still discharge along Wallisville Road and so its routing description on the permit cover sheet does not need to be modified. For the landowner map in the application (Attachment A-4-1), Lyondell has shown the possible range along Wallisville Road where Outfall 010 might be located so that all necessary landowners would be included in the application public notices.

The updated latitude/longitude coordinates and sampling point descriptions for Outfalls 008, 009, and 010 are provided in the Technical Report of the Application.

REVISE DISCHARGE ROUTING DESCRIPTION FOR OUTFALL 009

The description of the Outfall 009 routing to receiving waters on the permit cover sheet needs to be revised based on newer information. The description in the current permit is "to HCFCD ditch G999-00-00, thence to Bear Lake..." and should be changed to "to an unnamed ditch, thence to Bear Lake." The reference to HCFCD ditch G999-00-00 was originally taken from a 2016 HCFCD map, but current HCFCD maps do not shown this ditch as part of the HCFCD system or with any specific ID. Lyondell has recently confirmed with the HCFCD that the ditch is not part of the HCFCD system.

REMOVAL OF COMPLETED OTHER REQUIREMENTS

Lyondell requests removal of Other Requirements Nos. 5, 12, and 14 because these requirements have been completed.

Other Requirement No. 5 set a 3-year compliance schedule for attaining water quality-based effluent limits (WQBELs) for total copper for Outfall 001, which Lyondell completed in January 2020.

Other Requirement No. 12 required four analyses for zinc for Outfall 005 and these have been completed.

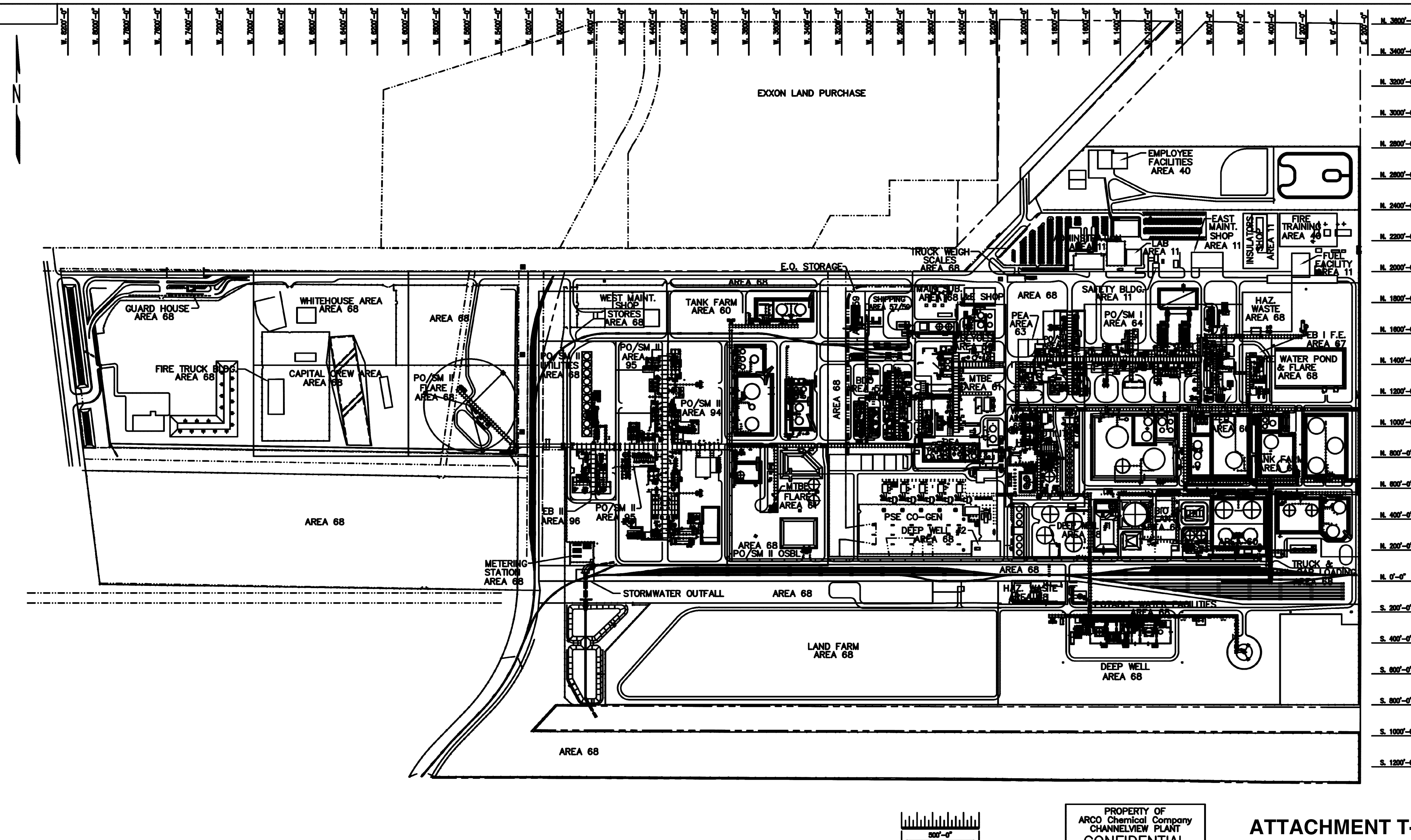
Other Requirement No. 14 relates to an aluminum partitioning coefficient study for Outfalls 003, 004, and 005. Lyondell submitted the results of this study to the TCEQ on December 21, 2020.

UPDATE POND REQUIREMENTS

Lyondell requests that Other Requirement No. 4 in the TPDES permit that is related to ponds be updated to the version now being used by the TCEQ. The newer version states in the first paragraph that the requirements do not apply to ponds that contain only stormwater. The older version is in the current TPDES permit and it states that it applies to ponds that contain stormwater from industrial activity, but the TCEQ later dropped this distinction.

ATTACHMENT T-3
Laboratories for Outfall Analyses

Parameters	Laboratory
Dissolved oxygen, pH, sulfite, temperature, total organic carbon, total residual chlorine, total suspended solids	Lyondell Chemical Company Channelview Complex South (permittee)
Alkalinity, ammonia, biochemical oxygen demand, bromide, carbonaceous biochemical oxygen demand, chemical oxygen demand, chloride, fluoride, metals (except mercury), methanol, nitrate, nitrate-nitrite, oil and grease, phosphorus, sulfate, sulfide, total dissolved solids, total organic nitrogen	Environmental Chemistry, Inc. 2525 West Bellfort, Suite 175 Houston, TX 77054-5027 Accreditation Certificate: T104704226-20-21
PCBs, pesticides, semivolatiles, volatiles	A&B Environmental Services, Inc. 10100 East Freeway, Suite 100 Houston, TX 77029-1919 Accreditation Certificate: T104704213-20-24
Color, surfactants, total Kheldahl nitrogen	TestAmerica Laboratories, Inc. – Houston 6310 Rothway Street Houston, TX 77040-5056 Accreditation Certificate: T104704223-20-27
Cyanide (available, free)	Eurofins TestAmerica Laboratories Pittsburgh 301 Alpha Drive Pittsburgh, PA 15238-2907 Accreditation Certificate: T104704528-20-9
Nonylphenol	Eurofins TestAmerica, Inc. Denver 4955 Yarrow Street Arvada, CO 80002-4517 Accreditation Certificate: T104704183-20-18
Mercury	Albion Environmental 4505 Boyett Street Bryan, TX 77801-4614 Accreditation Certificate: T104704391-20-12



PROPERTY OF
ARCO Chemical Company
CHANNELVIEW PLANT
CONFIDENTIAL
INFORMATION

ATTACHMENT T-4-1

ARCO Chemical Company
LOCATION: CHANNELVIEW PLANT
TECH. DEPT.

PLOT PLAN
OVERALL PLANT FACILITIES

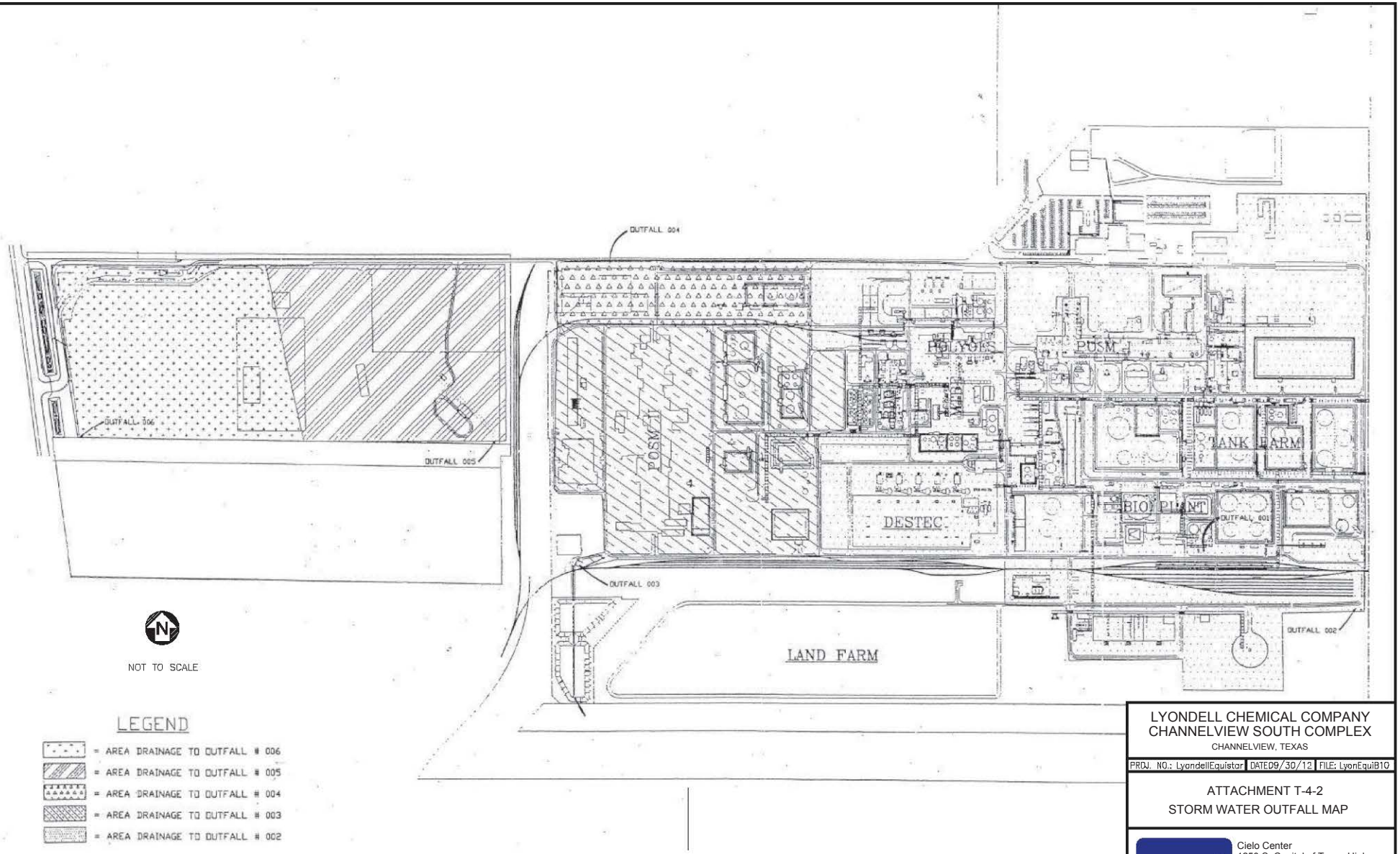
D-34-L-0101: KEY PLOT PLAN

REV. NO.	DATE	AFC/W.O.	REVISIONS
1			
0	12/11/00		
A	4/22/97		ISSUED FOR REVIEW & COMMENT

DATE	SCALE	DRAWING NUMBER				REV
4/17/97	1"=500'-0"	D	34	L	0101	1

NOTES

REFERENCE DRAWINGS

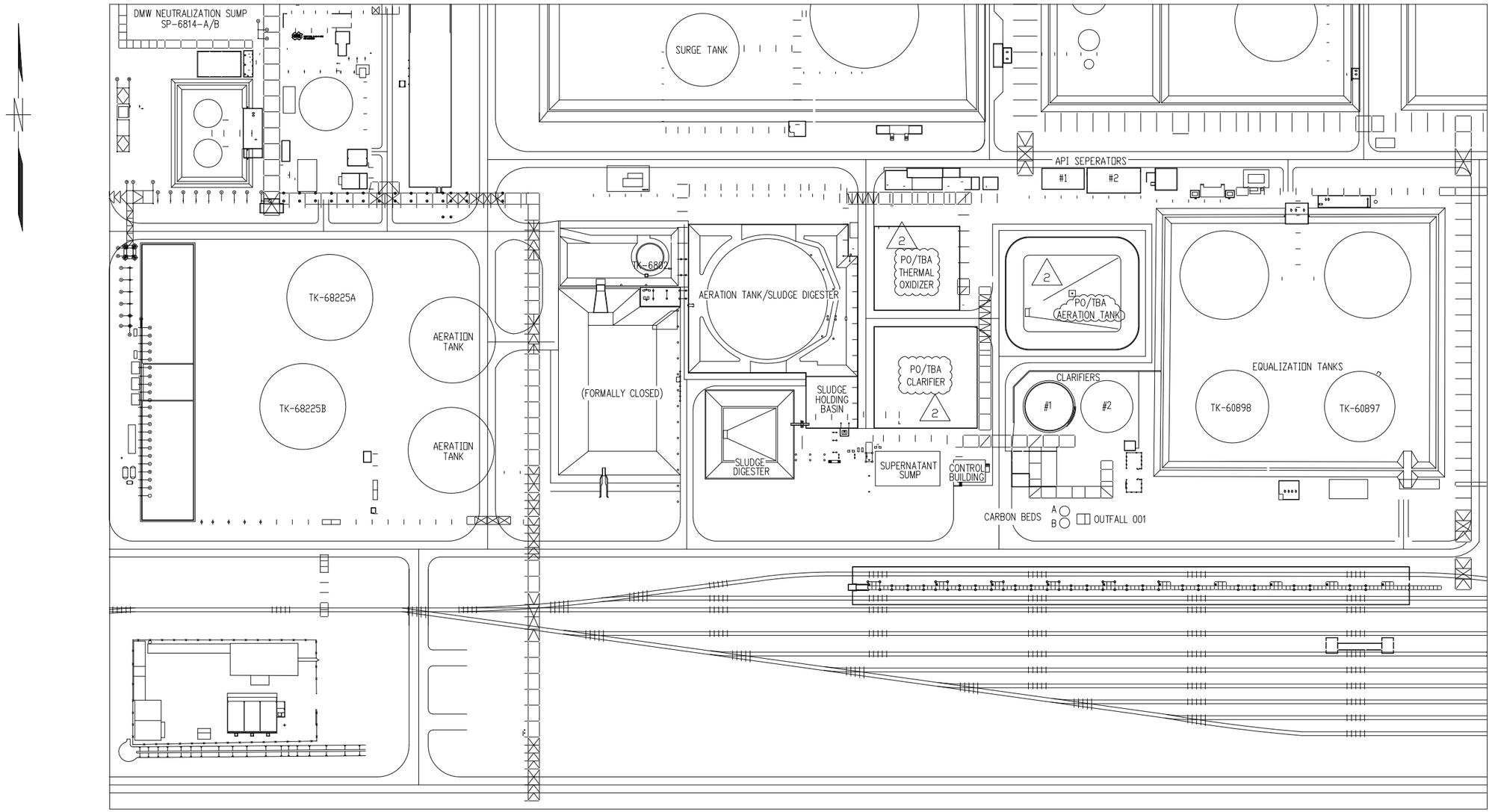


LYONDELL CHEMICAL COMPANY
CHANNELVIEW SOUTH COMPLEX
CHANNELVIEW, TEXAS

PROJ. NO.: LyondellEquistar | DATE09/30/12 | FILE: LyonEquiB10

ATTACHMENT T-4-2
STORM WATER OUTFALL MAP

RPS
Cielo Center
1250 S. Capital of Texas Highway
Building 3, Suite 200
Austin, Texas 78746
TBPE No. 1298



ATTACHMENT T-4-3

PROPERTY OF
Lyondell Chemical Company
CHANNELVIEW PLANT
CONFIDENTIAL
INFORMATION

Lyondell Chemical Company
CHANNELVIEW PLANT

GENERAL PLANT LAYOUT
WASTE WATER TREATMENT UNIT

REV. NO.	DATE	APC/W.O.	REVISIONS	DRN.	DATE
2	11/12/20	AS-BUILT	UPDATED FROM FIELD WALKDOWN PER ENG REDLINE, PER AS-BUILT	YMG NR	
1	1/99	5168	REVISED AS BUILT	MWK	CHK. DATE
				DRN.	APP. DATE

SCALE

DRAWING NUMBER: D 68 L 0265 — REV 2

NOTES

REFERENCE DRAWINGS

CVO–NORTH

WALLISVILLE ROAD

NEWTON ROAD

3.77° TRUE NORTH

PLANT NORTH

CVO WIND ROSE

- 1.00 - 3.00 m/s
- 4.00 - 7.00 m/s
- 8.00 - 12.00 m/s
- 13.00 - 18.00 m/s
- 19.00 - 24.00 m/s
- > 12.00 m/s

33kV O.H. POLELINE ROUTE (METERING STATION REFEED)

PIPELINE UTILITIES PROTECTION SLAB

PROPERTY LINE

STORM WATER RETENTION POND 1

STORM WATER RETENTION POND 2

STORM WATER RETENTION POND 3

135kV EXIST. SWITCHYARD

MATCHLINE N. 1630'-0" FOR CONT. SEE DWG. L1PO-CVO-50-PP-0013

008

009

ATTACHMENT T-4-4

20' 60' 100' 200' 300' 400' 500'

FLUOR.

IFC – Issued for Construction

Mar 17, 2020

lyondellbasell

Channelview

Project No. LBT/16001

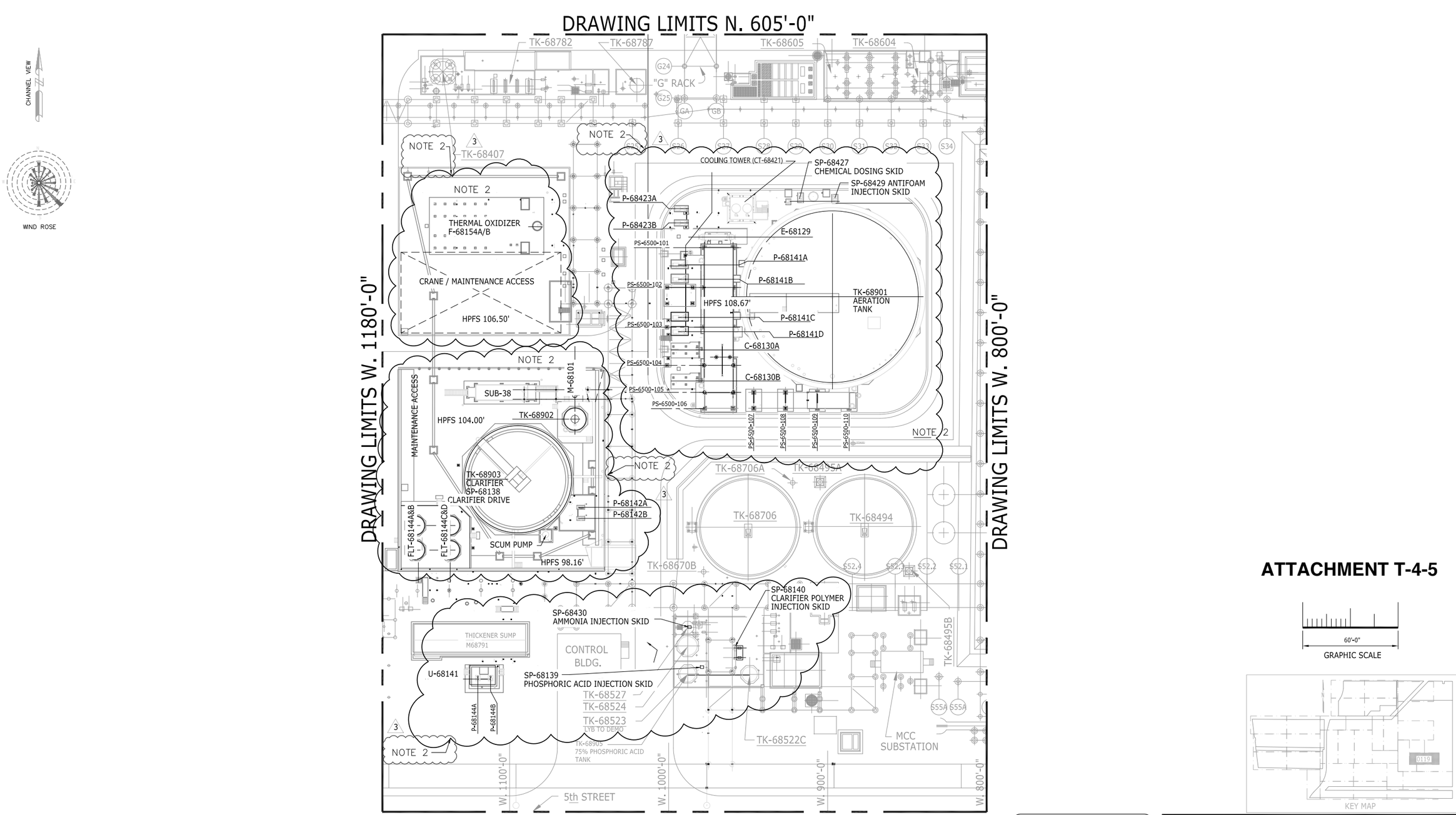
PO TBA CVO
OVERALL PLOT PLAN

DRN. G.Q.	DATE 06/28/2016	SCALE 1"=125'-0"	DRAWING NUMBER: L1PO CVO 50 PP-001	SHT. 1OF1	REV. 7
CHK. W.B.	DATE 06/28/2016				
APP. W.B.	DATE 06/28/2016				

NO.	DATE	REVISIONS	DRN.	APP.
7	03/16/2020	ISSUED FOR CONSTRUCTION	IL	W.B
6	05/31/2019	ISSUED FOR INFORMATION	IL	W.B
5	06/28/2018	REISSUED FOR DESIGN	G.Q	W.B
4	05/18/2017	REISSUED FOR DESIGN (REFEED BASIS OF ESTIMATE)	W.C	W.B
3	02/06/2017	REISSUED FOR DESIGN (REFEED)	W.C	W.B
2	08/30/2016	ISSUED FOR DESIGN	W.C	W.B
1	08/12/2016	ISSUED FOR ESTIMATE AFC/VB_NO	W.C	W.B

NOTES

REFERENCE DRAWINGS



ATTACHMENT T-4-5

GRAPHIC SCALE 60'-0"

KEY MAP

FLUOR

IFC – Issued for Construction
Jan 14, 2020

lyondellbasell
Channelview

NOTES:
1. CLOUD REPRESENTS PO/TBA SCOPE.
2. FOR STRUCTURAL FOUNDATION AND LOCATIONS OF EQUIPMENT, STRUCTURES, AND RACKS, SEE STRUCTURAL PLAN CORRESPONDING TO EQUIPMENT STRUCTURES AND RACK SHOWN ON THIS DRAWING. 3

NOTES

D-34-L-0100: GENERAL PLOT PLAN SYMBOLOGY
D-34-L-0101: OVERALL PLOT PLAN
D-34-L-0102: OVERALL KEY PLOT PLAN
L1PO-CVO-50-PP-013 OVERALL CVO SOUTH PROJECT SCOPE KEY PLAN 3

REFERENCE DRAWINGS

NO.	DATE	REVISIONS	DRN.	APP.
3	01/10/20	ISSUED FOR CONSTRUCTION	MSE	SPE
2	06/20/19	ISSUED FOR INFORMATION	JHC	
1	03/15/17	ISSUED FOR DESIGN (RE-FEED)	BJH	
0	03/02/17	ISSUED FOR DESIGN	BJH	
A	02/21/17	ISSUED FOR APPROVAL	BJH	
1	10/31/18	ISSUED FOR CONSTRUCTION		

Project No. LBT/16001

PO/TBA CVO
WASTE WATER TREATMENT PLANT
PLOT PLAN PO/TBA SCOPE

DRN.	BJH	DATE	02/21/17	SCALE	DRAWING NUMBER				SHT.	REV.
CHK.	WB	DATE	02/21/17	1"=30'-0"	L1PO	CVO	50	PP-0017	1	3
APP.	NK	DATE	02/21/17							

Attachment T-5
Treatment Chemicals
Lyondell Channelview
WQ0002927000

Product	Purpose	Average Usage*	Chemicals Listed in SDS	Aquatic Toxicity Data in SDS	Persistence / Bioaccumulative Information in SDS
Cooling Towers					
AF1440	Anti-foam	< 1 gpd	Distillates (petroleum), hydrotreated middle [64742-46-7] Fatty acid ethoxylate [61791-00-2] Fatty acids, C16-18 [67701-03-5]	Yes	Yes
AZ8104	Azole yellow metal corrosion inhibitor	7.3 gpd	Chlorotolyltriazole sodium salt [202420-04-0] Dichlorotolyltriazole [N/A] Sodium 4(or 5)-methyl-1H-benzotriazolide [64665-57-2] Sodium hydroxide [1310-73-2]	Yes	Yes
BD1501E	Biodispersant	3.4 gpd	Alcohols, C10, alkoxylated [166736-08-9]	Yes	No
GN8020	Dispersant and scale inhibitor	34.2 gpd	Carboxylic acid polymer	Yes	Yes
MD4107	Passivation	< 1 gpd	No hazardous ingredients listed.	Yes	No
MS6206	Corrosion inhibitor	5.7 gpd	Dipotassium hydrogenorthophosphate [7758-11-4] Tetrapotassium pyrophosphate [7320-34-5]	Yes	No
NX1102	Non-oxidizing biocide	< 1 gpd	2,2-Dibromo-3-nitrilopropionamide [10222-01-2] Sodium bromide [7647-15-6]	Yes	Yes
Sodium Hypochlorite	Biocide	600 gpd	Hypochlorous acid, sodium salt [7681-52-9] Sodium hydroxide [1310-73-2]	Yes	No
Sulfuric acid	pH control	As needed	Sulfuric acid [7664-93-9]	No	No
Boilers					
HTP73301	Corrosion inhibitor and dispersant	6.1 gpd	No hazardous ingredients listed. Blend of polymers with phosphate molecules attached.	Yes	Yes
HTP73611	Corrosion inhibitor and dispersant	6.2 gpd	Blend of polymers with phosphate molecules attached. Sodium hydroxide [1310-73-2]	Yes	Yes
NA8580	Neutralizing amine	6.2 gpd	Ethanolamine [141-43-5] Cyclohexylamine [108-91-8] Dimethylaminopropylamine [109-55-7] Diethanolamine [111-42-2]	Yes	Yes
OS7785	Oxygen scavenger	10.9 gpd	Hydroquinone [123-31-9]	Yes	Yes
Wastewater Treatment					
PC1192	Coagulant	5-6 gpd	N,N-Dimethyl-N-2-propenyl-2-propen-1-ammonium chloride homopolymber [26062-79-3]	Yes	Yes

Notes

gpd - gallons per day

Dosages as currently utilized in cooling towers and boilers at the facility. Chemical additives may be changed depending upon conditions and operations. New additives are likely to be similar to those currently in use.

SAFETY DATA SHEET
FOAMTROL* AF1440

1. Identification

Product identifier **FOAMTROL AF1440**

Other means of identification None.

Recommended use Antifoam

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Carcinogenicity	Category 1B
Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
Aspiration hazard	Category 1

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May be fatal if swallowed and enters airways. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May cause cancer.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves. Wear eye protection/face protection.

Response IF SWALLOWED: Immediately call a POISON CENTER/doctor. Do NOT induce vomiting. If on skin: Wash with plenty of water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. Call a POISON CENTER/doctor if you feel unwell. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
Distillates(petroleum), hydrotreated middle	64742-46-7	60 - 80
Fatty acid ethoxylate	61791-00-2	2.5 - 10
Fatty acids, C16-18	67701-03-5	2.5 - 10

Composition comments	Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
Skin contact	Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Most important symptoms/effects, acute and delayed	Aspiration may cause pulmonary edema and pneumonitis. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Carbon dioxide, dry chemicals, foam, water spray (fog).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Cool containers / tanks with water spray.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist or vapor. Do not touch or walk through spilled material. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store locked up. Store away from oxidizers. Store in original tightly closed container. Store between 32 - 38 °C. If storage is below 32 °C, warm and mix prior to use to ensure homogeneity. Store in accordance with local/regional/national/international regulation.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Distillates(petroleum), hydrotreated middle (CAS 64742-46-7)	PEL	5 mg/m3	Mist.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Distillates(petroleum), hydrotreated middle (CAS 64742-46-7)	TWA	5 mg/m3	Inhalable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Distillates(petroleum), hydrotreated middle (CAS 64742-46-7)	STEL	10 mg/m3	Mist.
	TWA	5 mg/m3	Mist.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Eye wash fountain and emergency showers are recommended. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection

Splash proof chemical goggles.

Skin protection

Hand protection

Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present.

Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Color Amber

Physical state Liquid

Odor Hydrocarbon

Odor threshold Not available.

pH in aqueous solution 5.6 (5% EMULSION)

Melting point/freezing point 18 °F (-8 °C)

Initial boiling point and boiling range	350 °F (177 °C)
Flash point	> 200 °F (> 93 °C) P-M(CC)
Evaporation rate	< 1 (Ether = 1)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	< 1 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	> 1 (Air = 1)
Relative density	0.87
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	0 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	11 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Pour point	< 60 °F (< 16 °C)
Specific gravity	0.867
VOC	53.9 % (Estimated)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Oxides of carbon evolved in fire. No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact	May cause irritation.
Eye contact	Causes serious eye irritation.
Ingestion	Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.
Symptoms related to the physical, chemical and toxicological characteristics	Aspiration may cause pulmonary edema and pneumonitis. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity	May be fatal if swallowed and enters airways.

Product	Species	Test Results
FOAMTROL AF1440 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg, (Calculated according to GHS additivity formula)
Inhalation		
LC50	Rat	> 5 mg/l, 4 Hours, (Calculated according to GHS additivity formula)
Oral		
LD50	Rat	> 5000 mg/kg, (Calculated according to GHS additivity formula)

Components	Species	Test Results
Distillates(petroleum), hydrotreated middle (CAS 64742-46-7)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	4.6 mg/l, 4 Hours
Oral		
LD50	Rat	> 5000 mg/kg
Fatty acids, C16-18 (CAS 67701-03-5)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Oral		
LD50	Rat	> 5000 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization This product is not expected to cause respiratory sensitization.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity May cause cancer.

ACGIH Carcinogens

Distillates(petroleum), hydrotreated middle (CAS 64742-46-7)	A2 Suspected human carcinogen.
	A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Distillates(petroleum), hydrotreated middle (CAS 64742-46-7)	3 Not classifiable as to carcinogenicity to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Distillates(petroleum), hydrotreated middle (CAS 64742-46-7)	Known To Be Human Carcinogen.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard May be fatal if swallowed and enters airways.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
FOAMTROL AF1440 (CAS Mixture)			
Aquatic			
Crustacea	LC50	Daphnia magna	720 mg/L, Static Acute Bioassay, 48 hour
	NOEL	Daphnia magna	250 mg/L, Static Acute Bioassay, 48 hour
Fish	LC50	Rainbow Trout	353 mg/L, Static Acute Bioassay, 96 hour
	NOEL	Rainbow Trout	250 mg/L, Static Acute Bioassay, 96 hour

Bioaccumulative potential

Mobility in soil No data available.

Other adverse effects Not available.

Persistence and degradability

- COD (mgO2/g)	1486 (calculated data)
- BOD 5 (mgO2/g)	138 (calculated data)
- BOD 28 (mgO2/g)	285 (calculated data)
- Closed Bottle Test (% Degradation in 28 days)	13 (calculated data)
- TOC (mg C/g)	500 (calculated data)

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	Yes
Classified hazard categories	Skin corrosion or irritation Serious eye damage or eye irritation Carcinogenicity Specific target organ toxicity (single or repeated exposure) Aspiration hazard

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

1,4-DIOXANE (CAS 123-91-1)
Ethylene oxide (oxirane) (CAS 75-21-8)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Ethylene oxide (oxirane) (CAS 75-21-8)

Safe Drinking Water Act (SDWA)	Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Food and drug administration	21 CFR 176.210 (defoaming agents used in the manufacture of paper and paperboard)
NSF Registered and/or meets USDA (according to 1998 guidelines):	Registration No. – 148167 Category Code(s): G5 Cooling and retort water treatment products G7 Boiler, steam line treatment products – nonfood contact

US state regulations

US. California Proposition 65

WARNING: This product can expose you to chemicals including Ethylene oxide (oxirane), which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

1,4-DIOXANE (CAS 123-91-1)	Listed: January 1, 1988
Ethylene oxide (oxirane) (CAS 75-21-8)	Listed: July 1, 1987

US - California Proposition 65 - CRT: Listed date/Developmental toxin

Ethylene oxide (oxirane) (CAS 75-21-8)	Listed: August 7, 2009

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

Ethylene oxide (oxirane) (CAS 75-21-8)	Listed: February 27, 1987

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

Ethylene oxide (oxirane) (CAS 75-21-8)	Listed: August 7, 2009

16. Other information, including date of preparation or last revision

Issue date	Nov-14-2014
Revision date	Apr-25-2019
Version #	3.0

NFPA ratings	Health: 2 Flammability: 0 Instability: 0
NFPA ratings	
List of abbreviations	CAS: Chemical Abstract Service Registration Number ACGIH: American Conference of Governmental Industrial Hygienists TWA: Time Weighted Average STEL: Short Term Exposure Limit LD50: Lethal Dose, 50% LC50: Lethal Concentration, 50% NOEL: No Observed Effect Level COD: Chemical Oxygen Demand BOD: Biochemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	This document has undergone significant changes and should be reviewed in its entirety.
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

SAFETY DATA SHEET
INHIBITOR AZ8104

1. Identification

Product identifier **INHIBITOR AZ8104**

Other means of identification None.

Recommended use Water-based corrosion inhibitor

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May be corrosive to metals. Causes severe skin burns and eye damage. Causes serious eye damage. May cause respiratory irritation.

Precautionary statement

Prevention Keep only in original container. Do not breathe mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.

Response IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. Absorb spillage to prevent material-damage.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in corrosive resistant container with a resistant inner liner.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
Chlorotolyltriazole sodium salt	202420-04-0	10 - 20
DICHLOROTOLYLTRIAZOLE	NOT ASSIGNED	2.5 - 10
Sodium 4(or 5)-methyl-1H-benzotriazolide	64665-57-2	1 - 2.5
Sodium hydroxide	1310-73-2	1 - 2.5

Composition comments Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Cool containers / tanks with water spray.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Never return spills to original containers for re-use.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling Alkaline. Do not mix with acidic material. Do not breathe mist or vapor. Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Do not get in eyes, on skin, or on clothing.

Conditions for safe storage, including any incompatibilities Store away from oxidizers. Store away from acids. Store in a cool, dry place out of direct sunlight. Store locked up. Keep only in the original container.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	PEL	2 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Eye wash facilities and emergency shower must be available when handling this product. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Hand protection Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present.

Other Wear appropriate chemical resistant clothing.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Color Yellow to amber

Physical state Liquid

Odor Slight

Odor threshold Not available.

pH (concentrated product) 12.7

pH in aqueous solution 11.6 (5% SOL.)

Melting point/freezing point 12 °F (-11 °C)

Initial boiling point and boiling range 210 °F (99 °C)

Flash point Not applicable.

Evaporation rate < 1 (Ether = 1)

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1.13
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	5 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Pour point	17 °F (-8 °C)
Specific gravity	1.132
VOC	0 % (Estimated)

10. Stability and reactivity

Reactivity	May be corrosive to metals. May react violently with acidic materials.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong acids. Strong oxidizing agents. Metals.
Hazardous decomposition products	Hydrogen chloride, oxides of carbon and nitrogen evolved in fire.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Information on toxicological effects

Acute toxicity May cause respiratory irritation.

Product	Species	Test Results
INHIBITOR AZ8104 (CAS Mixture)		
Acute		
Dermal		
LD50	Rat	> 5000 mg/kg, (Calculated according to GHS additivity formula)

Product	Species	Test Results
Oral		
LD50	Rat	> 5000 mg/kg, (Calculated according to GHS additivity formula)

Components	Species	Test Results
Chlorotolyltriazole sodium salt (CAS 202420-04-0)		
Acute		
Dermal		
LD50	Rat	> 5000 mg/kg
Oral		
LD50	Rat	3100 mg/kg
DICHLOROTOLYLTRIAZOLE (CAS NOT ASSIGNED)		
Acute		
Dermal		
LD50	Rat	> 5000 mg/kg
Oral		
LD50	Rat	3100 mg/kg
Sodium 4(or 5)-methyl-1H-benzotriazolide (CAS 64665-57-2)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Oral		
LD50	Rat	735 mg/kg
Sodium hydroxide (CAS 1310-73-2)		
Acute		
Dermal		
LD50	Rabbit	1350 mg/kg
Oral		
LD50	Rabbit	> 500 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Causes severe skin burns and eye damage.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization This product is not expected to cause respiratory sensitization.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Based on available data, the classification criteria are not met.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity

Product			Species	Test Results
INHIBITOR AZ8104 (CAS Mixture)				
		LC50	Annelida(Lumbriculus variegatus)	138 mg/L, Static Acute Bioassay, 96 hour
			Benthic Crustacean(Gammerus pseutolimnaeus)	42.1 mg/L, Static Acute Bioassay, 96 hour
			Freshwater Snail(Physa sp.)	47.4 mg/L, Static Acute Bioassay, 96 hour
			Midge larvae (Chironomus tentans)	95.8 mg/L, Static Acute Bioassay, 96 hour
		NOEL	Annelida(Lumbriculus variegatus)	62.5 mg/L, Static Acute Bioassay, 96 hour
			Benthic Crustacean(Gammerus pseutolimnaeus)	25 mg/L, Static Acute Bioassay, 96 hour
			Freshwater Snail(Physa sp.)	25 mg/L, Static Acute Bioassay, 96 hour
			Midge larvae (Chironomus tentans)	62.5 mg/L, Static Acute Bioassay, 96 hour
	Other	EC50	Pseudokirchnerella subcapitata	132 mg/l, 96 Hours
	Aquatic			
	Crustacea	EC0	Daphnia magna	155 mg/L, Static Acute Bioassay, 48 hour, (pH adjusted)
		EC50	Daphnia magna	210 mg/L, Static Acute Bioassay, 48 hour, (pH adjusted)
				50 mg/L, Chronic Bioassay, 21 day, (pH adjusted)
		LC50	Ceriodaphnia	124 mg/L, Static Renewal Bioassay, 48 hour
			Daphnia magna	217 mg/L, Static Renewal Bioassay, 48 hour, (pH adjusted)
			Mysid Shrimp	53 mg/L, Static Acute Bioassay, 48 hour, (pH adjusted)
		LOEL	Ceriodaphnia	40 mg/L, Chronic Bioassay, 7 day
		NOEL	Ceriodaphnia	75 mg/L, Static Renewal Bioassay, 48 hour
				20 mg/L, Chronic Bioassay, 7 day
			Daphnia magna	148 mg/L, Static Renewal Bioassay, 48 hour, (pH adjusted)
				27 mg/L, Chronic Bioassay, 21 day, (pH adjusted)
			Mysid Shrimp	25 mg/L, Static Acute Bioassay, 48 hour, (pH adjusted)
	Fish	LC50	Bluegill Sunfish	36.6 mg/L, Static Acute Bioassay, 96 hour
			Fathead Minnow	135 mg/L, Static Acute Bioassay, 96 hour, (pH adjusted)
				50.7 mg/L, Static Renewal Bioassay, 96 hour, (pH adjusted)
			Menidia beryllina (Silversides)	41 mg/L, Static Acute Bioassay, 96 hour
			Rainbow Trout	15.4 mg/L, Static Renewal Bioassay, 96 hour
			Sheepshead Minnow	132 mg/L, Static Acute Bioassay, 96 hour, (pH adjusted)

Product		Species	Test Results
	LOEL	Fathead Minnow	8.3 mg/L, Chronic Flow-Thru Bioassay, 28 day, (pH adjusted)
	NOEL	Bluegill Sunfish	25 mg/L, Static Acute Bioassay, 96 hour
		Fathead Minnow	21.8 mg/L, Static Renewal Bioassay, 96 hour, (pH adjusted)
			15 mg/L, Static Acute Bioassay, 96 hour, (pH adjusted)
			4.2 mg/L, Chronic Flow-Thru Bioassay, 28 day, (pH adjusted)
		Menidia beryllina (Silversides)	25 mg/L, Static Acute Bioassay, 96 hour
		Rainbow Trout	6.3 mg/L, Static Renewal Bioassay, 96 hour
		Sheepshead Minnow	100 mg/L, Static Acute Bioassay, 96 hour, (pH adjusted)

Components		Species	Test Results
Chlorotolyltriazole sodium salt (CAS 202420-04-0)			
Aquatic			
Algae	EbC50	Algae	6.84 mg/l
	ErC50	Algae	18.6 mg/l

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects Nutrients: N: 13,3 mg/g

Persistence and degradability

- COD (mgO2/g)	300
- BOD 5 (mgO2/g)	15
- BOD 28 (mgO2/g)	15
- Closed Bottle Test (% Degradation in 28 days)	6
- Zahn-Wellens Test (% Degradation in 28 days)	0
- TOC (mg C/g)	100

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN1760

UN proper shipping name Corrosive liquids, n.o.s. (SODIUM HYDROXIDE, HALOGENATED AROMATIC HETEROCYCLE)

Transport hazard class(es)

Class 8

Subsidiary risk -

Packing group II
Special precautions for user Not available.
ERG number 154
Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

UN number UN1760
UN proper shipping name Corrosive liquid, n.o.s. (SODIUM HYDROXIDE, HALOGENATED AROMATIC HETEROCYCLE)
Transport hazard class(es)
Class 8
Subsidiary risk -
Packing group II
Environmental hazards No.
ERG Code 154
Special precautions for user Not available.

IMDG

UN number UN1760
UN proper shipping name CORROSIVE LIQUID, N.O.S. (SODIUM HYDROXIDE, HALOGENATED AROMATIC HETEROCYCLE)
Transport hazard class(es)
Class 8
Subsidiary risk -
Packing group II
Environmental hazards
Marine pollutant No.
EmS F-A, S-B
Special precautions for user Not available.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Sodium hydroxide (CAS 1310-73-2) Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	Yes
Classified hazard categories	Corrosive to metal Skin corrosion or irritation Serious eye damage or eye irritation Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)	Hazardous substance
Safe Drinking Water Act (SDWA)	Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

NSF Registered and/or meets USDA (according to 1998 guidelines):	Registration No. – 141530 Category Code(s): G5 Cooling and retort water treatment products G7 Boiler, steam line treatment products – nonfood contact

US state regulations

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

16. Other information, including date of preparation or last revision

Issue date	Oct-24-2014
Revision date	Apr-26-2019
Version #	4.0
NFPA ratings	Health: 3 Flammability: 0 Instability: 0

NFPA ratings

List of abbreviations

CAS: Chemical Abstract Service Registration Number
TWA: Time Weighted Average
STEL: Short Term Exposure Limit
LD50: Lethal Dose, 50%
LC50: Lethal Concentration, 50%
NOEL: No Observed Effect Level
COD: Chemical Oxygen Demand
BOD: Biochemical Oxygen Demand
TOC: Total Organic Carbon
IATA: International Air Transport Association
IMDG: International Maritime Dangerous Goods Code
ACGIH: American Conference of Governmental Industrial Hygienists
TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.

References:

No data available

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision information

First-aid measures: Inhalation
Handling and storage: Conditions for safe storage, including any incompatibilities
Physical & Chemical Properties: Multiple Properties
Stability and reactivity: Conditions to avoid
Regulatory information: California Prop 65
Other information, including date of preparation or last revision: Disclaimer

Prepared by

This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

SAFETY DATA SHEET
SPECTRUS* BD1501E

1. Identification

Product identifier **SPECTRUS BD1501E**

Other means of identification None.

Recommended use Biodispersant

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement Causes skin irritation. Causes serious eye damage. May cause respiratory irritation.

Precautionary statement

Prevention Wear eye/face protection. Avoid breathing mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves.

Response If on skin: Wash with plenty of water/. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor/. Specific treatment (see this label). If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
Alcohols, C10, alkoxylated	166736-08-9	10 - 20

Composition comments Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing stops, provide artificial respiration. For breathing difficulties, oxygen may be necessary. Call a POISON CENTER or doctor/physician if you feel unwell. If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

Skin contact Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation occurs: Get medical advice/attention.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Ingestion Rinse mouth. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do not induce vomiting. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. May cause redness and pain.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of vapors or mists. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. See Section 8 of the SDS for Personal Protective Equipment. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Prevent entry into waterways, sewer, basements or confined areas.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. Ventilate area, use specified protective equipment. Flush area with water. Wet area may be slippery.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Do not get this material in contact with eyes. Avoid breathing mist or vapor. Avoid contact with skin. Avoid contact with clothing. Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in original tightly closed container. Store in cool, well ventilated area. Store away from oxidizers.

8. Exposure controls/personal protection

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product. Adequate ventilation to maintain air contaminants below exposure limits. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Splash proof chemical goggles. Face shield.
Skin protection	
Hand protection	Chemical resistant gloves.
Other	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. Impervious gloves. Wash off after each use. Replace as necessary.
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary. Not applicable.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Color	Colorless
Physical state	Liquid
Odor	Mild
Odor threshold	Not available.
pH (concentrated product)	6.7
Melting point/freezing point	31 °F (-1 °C)
Initial boiling point and boiling range	220 °F (104 °C)
Flash point	Not applicable.
Evaporation rate	< 1 (Ether = 1)
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)

Vapor density	< 1 (Air = 1)
Relative density	1.02
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	110 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Pour point	36 °F (2 °C)
Specific gravity	1.019
VOC	0 % (Estimated)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.
Conditions to avoid	Avoid contact with strong oxidizers. Protect from freezing.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Oxides of carbon evolved in fire.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye damage.
Ingestion	Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics	Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity May cause respiratory irritation.

Product	Species	Test Results
SPECTRUS BD1501E (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg, (Calculated according to GHS additivity formula)
Oral		
LD50	Rat	3570 mg/kg, (Calculated according to GHS additivity formula (Category 5))

Components	Species	Test Results
Alcohols, C10, alkoxylated (CAS 166736-08-9)		
Acute		
Oral		
LD50	Rat	500 - 2000 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization Not available.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Based on available data, the classification criteria are not met. May be harmful if swallowed and enters airways.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
SPECTRUS BD1501E (CAS Mixture)			
	IC25	Ceriodaphnia	39.9 mg/l, Chronic Bioassay, 7 day
	LC50	Ceriodaphnia	200 mg/l, Static Renewal Bioassay, 48 hour
		Fathead Minnow	82.5 mg/l, Static Renewal Bioassay, 96 hour
	NOEL	Ceriodaphnia	100 mg/l, Static Renewal Bioassay, 48 hour
			25 mg/l, Chronic Bioassay, 7 day
		Fathead Minnow	31.3 mg/l, Static Renewal Bioassay, 96 hour
Aquatic			
Crustacea	LC50	Daphnia magna	38.2 mg/l, Static Renewal Bioassay, 48 hour
	NOEL	Daphnia magna	12.5 mg/l, Static Renewal Bioassay, 48 hour
Fish	LC50	Rainbow Trout	141.4 mg/l, Static Renewal Bioassay, 96 hour
	NOEL	Rainbow Trout	100 mg/l, Static Renewal Bioassay, 96 hour

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects Not available.

Persistence and degradability

No data available

- **COD (mgO2/g)** 647 (calculated data)
- **BOD 5 (mgO2/g)** 0 (calculated data)
- **BOD 28 (mgO2/g)** 0 (calculated data)
- **TOC (mg C/g)** 0 (calculated data)

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130) Hazardous substance

Safe Drinking Water Act (SDWA) Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

NSF Registered and/or meets USDA (according to 1998 guidelines): Registration No. – 141060
Category Code(s):
G5 Cooling and retort water treatment products
G7 Boiler, steam line treatment products – nonfood contact

US state regulations WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

US - Massachusetts RTK - Substance List

Not regulated.

US - Pennsylvania RTK - Hazardous Substances

Not regulated.

US - Rhode Island RTK

Not regulated.

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

16. Other information, including date of preparation or last revision

Issue date Oct-27-2014

Revision date Dec-18-2017

Version # 2.1

List of abbreviations

CAS: Chemical Abstract Service Registration Number
TWA: Time Weighted Average
STEL: Short Term Exposure Limit
LD50: Lethal Dose, 50%
LC50: Lethal Concentration, 50%
NOEL: No Observed Effect Level
COD: Chemical Oxygen Demand
BOD: Biochemical Oxygen Demand
TOC: Total Organic Carbon
IATA: International Air Transport Association
IMDG: International Maritime Dangerous Goods Code
ACGIH: American Conference of Governmental Industrial Hygienists

References: No data available

Disclaimer The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision information This document has undergone significant changes and should be reviewed in its entirety.

SAFETY DATA SHEET
GENGARD* GN8020

1. Identification

Product identifier	**GENGARD GN8020**
Other means of identification	None.
Recommended use	Deposit control agent
Recommended restrictions	None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2
	Sensitization, skin	Category 1A
OSHA defined hazards	Not classified.	

Label elements

Signal word	Warning
Hazard statement	Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction.
Precautionary statement	
Prevention	Avoid breathing mist/vapor. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Wear eye protection/face protection. Wear protective gloves.
Response	If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash before reuse. If on skin: Wash with plenty of water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Storage	Store away from incompatible materials.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
Maleic acid	110-16-7	0.1 - 1
CARBOXYLIC ACID POLYMER	TSRN 125438 - 5052P	

Composition comments Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed Severe eye irritation. Skin irritation. May cause an allergic skin reaction. Dermatitis. Rash.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Carbon dioxide (CO2). Dry chemical powder.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Cool containers / tanks with water spray. Use standard firefighting procedures and consider the hazards of other involved materials.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid contact with spilled material. Ensure adequate ventilation. Avoid breathing mist/vapor. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Small Spills: Place in waste disposal container. Wet area may be slippery. Spread sand/grit. Following product recovery, flush area with water. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Large Spills: Cover with plastic sheet to prevent spreading. Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Ventilate the area.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions Avoid discharge into drains, water courses or onto the ground. Water contaminated with this product may be sent to a sanitary sewer treatment facility, or a permitted waste treatment facility, in accordance with any local agreements.

7. Handling and storage

Precautions for safe handling Observe good industrial hygiene practices. Do not get in eyes, on skin, on clothing. Provide adequate ventilation. Wear appropriate personal protective equipment. Avoid contact with eyes, skin, and clothing. Wash hands thoroughly after handling.

Conditions for safe storage, including any incompatibilities	Store in tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Store in cool, well ventilated area. Store containers closed when not in use. Avoid high temperatures. Protect from freezing. If frozen, thaw completely and mix thoroughly prior to use.

8. Exposure controls/personal protection

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present.
Other	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. Wash off after each use. Replace as necessary.
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance	
Color	Amber to brown
Physical state	Liquid
Odor	Slight sweet
Odor threshold	Not available.
pH (concentrated product)	2.6
pH in aqueous solution	3 (5% SOL.)
Melting point/freezing point	27 °F (-3 °C)
Initial boiling point and boiling range	212 °F (100 °C)
Flash point	Not applicable.
Evaporation rate	< 1 (Water = 1)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1.17
Relative density temperature	70 °F (21 °C)

Solubility(ies)

Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	17 cps
Viscosity temperature	70 °F (21 °C)

Other information

Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Pour point	32 °F (0 °C)
Specific gravity	1.166
VOC	0 % (Estimated)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Oxides of carbon, nitrogen, and sulphur evolved in fire.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	Causes skin irritation. May cause an allergic skin reaction.
Eye contact	Causes serious eye irritation.
Ingestion	Ingestion of large amounts may produce gastrointestinal disturbances including irritation, nausea, and diarrhea.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
GENGARD GN8020 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg, (Calculated according to GHS additivity formula)
Oral		
LD50	Rat	> 5000 mg/kg, (Calculated according to GHS additivity formula)

Components	Species	Test Results
CARBOXYLIC ACID POLYMER (CAS TSRN 125438 - 5052P)		
Acute		
Oral		
LD50	Rat	4563 mg/kg

Components	Species	Test Results
Maleic acid (CAS 110-16-7)		
Acute		
Dermal		
LD50	Rabbit	1560 mg/kg
Inhalation		
LC50	Rat	> 2.88 mg/L, 4 Hour
Oral		
LD50	Rat	708 mg/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes eye irritation.

Respiratory or skin sensitization

Respiratory sensitization This product is not expected to cause respiratory sensitization.

Skin sensitization May cause an allergic skin reaction.

Germ cell mutagenicity Not classified.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity Not classified.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Based on available data, the classification criteria are not met.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
GENGARD GN8020 (CAS Mixture)			
	IC50	Selenastrum (algae)	3872 mg/l, Growth Inhibition, 96 hour, (pH adjusted)
	LC50	Fathead Minnow	5814 mg/l, Static Renewal Bioassay, 96 hour, (pH adjusted)
	NOEL	Fathead Minnow	5000 mg/l, Static Renewal Bioassay, 96 hour, (pH adjusted)
		Selenastrum (algae)	2000 mg/l, Growth Inhibition, 96 hour, (pH adjusted)
Aquatic			
Crustacea	LC50	Daphnia magna	3628 mg/l, Static Renewal Bioassay, 48 hour, (pH adjusted)
	NOEL	Daphnia magna	1250 mg/l, Static Renewal Bioassay, 48 hour, (pH adjusted)
Fish	LC50	Rainbow Trout	7071 mg/l, Static Renewal Bioassay, 96 hour, (pH adjusted)
	NOEL	Rainbow Trout	5000 mg/l, Static Renewal Bioassay, 96 hour, (pH adjusted)

Persistence and degradability Not available.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)

Maleic acid	-0.48

Mobility in soil No data available.

Other adverse effects Not available.

Persistence and degradability

- COD (mgO2/g)	359
- BOD 5 (mgO2/g)	21
- BOD 28 (mgO2/g)	3
- Closed Bottle Test (% Degradation in 28 days)	1 OECD 301D
- TOC (mg C/g)	142 (calculated data)

13. Disposal considerations

Disposal instructions Dispose of contents/container in accordance with local/regional/national/international regulations. Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Via an authorized waste disposal contractor to an approved waste disposal site, observing all local and national regulations. Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Maleic acid (CAS 110-16-7) Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

Classified hazard categories
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitization

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Acrylic acid (CAS 79-10-7)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

NSF Registered and/or meets USDA (according to 1998 guidelines): Registration No. – 144523
Category Code(s):
G5 Cooling and retort water treatment products
G7 Boiler, steam line treatment products – nonfood contact

US state regulations

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

16. Other information, including date of preparation or last revision

Issue date Sep-26-2014

Revision date Feb-19-2019

Version # 5.0

NFPA ratings Health: 2
Flammability: 0
Instability: 0

NFPA ratings

List of abbreviations

CAS: Chemical Abstract Service Registration Number
NFPA: National Fire Protection Association
ACGIH: American Conference of Governmental Industrial Hygienists
TWA: Time Weighted Average
STEL: Short Term Exposure Limit
LD50: Lethal Dose, 50%
LC50: Lethal Concentration, 50%
EC50: Effect Concentration, 50%
NOEL: No Observed Effect Level
COD: Chemical Oxygen Demand
BOD: Biochemical Oxygen Demand
TOC: Total Organic Carbon
CEN: European Committee for Standardisation
IATA: International Air Transport Association
IMDG: International Maritime Dangerous Goods Code
TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.

References: No data available

Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	Hazard(s) identification: Prevention Composition / Information on Ingredients: Disclosure Overrides Accidental release measures: Methods and materials for containment and cleaning up Accidental release measures: Personal precautions, protective equipment and emergency procedures Handling and storage: Conditions for safe storage, including any incompatibilities Exposure controls/personal protection: Appropriate engineering controls Physical & Chemical Properties: Multiple Properties Stability and reactivity: Conditions to avoid Regulatory information: California Prop 65 Other information, including date of preparation or last revision: Bibliography HazReg Data: Europe - EU GHS: Classification
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

SAFETY DATA SHEET
OPTISPERSE* HTP73301

1. Identification

Product identifier **OPTISPERSE HTP73301**

Other means of identification None.

Recommended use Water based internal boiler treatment chemical.

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Hazard symbol None.

Signal word None.

Hazard statement The mixture does not meet the criteria for classification.

Precautionary statement

Prevention Observe good industrial hygiene practices.

Response Wash hands after handling.

Storage Store away from incompatible materials.

Disposal Dispose of contents/container to approved local facility.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.

Skin contact	Rinse skin with water/shower. Get medical attention if irritation develops and persists.
Eye contact	Immediately flush eyes with water for 15 minutes.
Ingestion	Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Not available.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Stop the flow of material, if this is without risk. Following product recovery, flush area with water. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Avoid prolonged exposure.
Conditions for safe storage, including any incompatibilities	Do not freeze. If frozen, thaw completely and mix thoroughly prior to use. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Store in accordance with local/regional/national/international regulation.

8. Exposure controls/personal protection

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Splash proof chemical goggles.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Suitable gloves can be recommended by the glove supplier. Glove selection must take into account any solvents and other hazards present.
Other	Wear suitable protective clothing.
Respiratory protection	Chemical respirator with organic vapor cartridge and full facepiece. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Color	Yellow to amber
Physical state	Liquid
Odor	Slight
Odor threshold	Not available.
pH (concentrated product)	9.6
pH in aqueous solution	10.2 (5% SOL.)
Melting point/freezing point	28 °F (-2 °C)
Initial boiling point and boiling range	210 °F (99 °C)
Flash point	> 200 °F (> 93 °C) P-M(CC)
Evaporation rate	< 1 (Ether = 1)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1.04
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	6 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Pour point	33 °F (1 °C)
Specific gravity	1.041
VOC	0 % (Calculated)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Not available.
Conditions to avoid	Protect from freezing.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Oxides of carbon and phosphorus evolved in fire. No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful. Mists/aerosols may cause irritation to upper respiratory tract.
Skin contact	Prolonged or repeated contact may cause transient irritation.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	May cause slight gastrointestinal irritation.
Symptoms related to the physical, chemical and toxicological characteristics	Prolonged and repetitive exposure, depending on the route(s), may develop transient irritation on skin, eyes, ingestion tract, and/or respiratory tract.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
OPTISPERSE HTP73301 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg, (Calculated according to GHS additivity formula)
Inhalation		
LC50	Rat	> 5 mg/l, 4 Hours, (Calculated according to GHS additivity formula)
Oral		
LD50	Rat	> 5000 mg/kg, (Calculated according to GHS additivity formula)

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.
Respiratory or skin sensitization	
Respiratory sensitization	Not available.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Based on available data, the classification criteria are not met. May be harmful if swallowed and enters airways.
Chronic effects	Prolonged inhalation may be harmful.
Further information	This product has no known adverse effect on human health.

12. Ecological information

Ecotoxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
OPTISPERSE HTP73301 (CAS Mixture)			
	LC50	Fathead Minnow	> 5000 mg/L, Acute Toxicity, 96 hour, (Estimated)
	NOEL	Fathead Minnow	3460 mg/L, Acute Toxicity, 96 hour, (Estimated)
Aquatic			
Crustacea	LC50	Daphnia magna	4360 mg/L, Acute Toxicity, 48 hour, (Estimated)
	NOEL	Daphnia magna	910 mg/L, Acute Toxicity, 48 hour, (Estimated)

Bioaccumulative potential

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

Environmental fate The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability

No data is available on the degradability of this product.

- COD (mgO2/g)	57 (calculated data)
- BOD 5 (mgO2/g)	6 (calculated data)
- BOD 28 (mgO2/g)	6 (calculated data)
- Closed Bottle Test (% Degradation in 28 days)	10 (calculated data)
- Zahn-Wellens Test (% Degradation in 28 days)	17 (calculated data)
- TOC (mg C/g)	15 (calculated data)

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory information

US federal regulations All components are on the U.S. EPA TSCA Inventory List.
This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Food and drug administration All ingredients in this product are authorized in 21 CFR176.170 for use in boilers where the steam will be used for manufacturing paper or paperboard.

US state regulations

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

US - Massachusetts RTK - Substance List

Not regulated.

US - Pennsylvania RTK - Hazardous Substances

Not regulated.

US - Rhode Island RTK

Not regulated.

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

16. Other information, including date of preparation or last revision

Issue date Nov-25-2014

Revision date Dec-17-2017

Version # 2.1

List of abbreviations	CAS: Chemical Abstract Service Registration Number TSRN indicates a Trade Secret Registry Number is used in place of the CAS number. ACGIH: American Conference of Governmental Industrial Hygienists NOEL: No Observed Effect Level STEL: Short Term Exposure Limit LC50: Lethal Concentration, 50% TWA: Time Weighted Average BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code LD50: Lethal Dose, 50% NFPA: National Fire Protection Association
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. The information in the sheet was written based on the best knowledge and experience currently available.
Revision information	This document has undergone significant changes and should be reviewed in its entirety.
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

SAFETY DATA SHEET
OPTISPERSE* HTP73611

1. Identification

Product identifier **OPTISPERSE HTP73611**

Other means of identification None.

Recommended use Water based internal boiler treatment chemical.

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May be corrosive to metals. Causes severe skin burns and eye damage. Causes serious eye damage. May cause respiratory irritation.

Precautionary statement

Prevention Keep only in original container. Do not breathe mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear eye protection/face protection.

Response If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. Absorb spillage to prevent material damage.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in a corrosive resistant container with a resistant inner liner.

Disposal Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
Sodium hydroxide	1310-73-2	2.5 - 10

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Ingestion Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Carbon dioxide (CO2). Foam. Dry chemical powder.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use standard firefighting procedures and consider the hazards of other involved materials. Cool containers / tanks with water spray.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling Alkaline. Do not mix with acidic material. Provide adequate ventilation. Observe good industrial hygiene practices. Wear appropriate personal protective equipment. Do not breathe mist or vapor. Avoid prolonged exposure. Do not get in eyes, on skin, or on clothing. Use care in handling/storage.

Conditions for safe storage, including any incompatibilities

Do not freeze. If frozen, thaw completely and mix thoroughly prior to use. Store locked up. Store away from incompatible materials (see Section 10 of the SDS). Store in a cool, dry place out of direct sunlight. Store in corrosive resistant container with a resistant inner liner. Keep only in the original container. Store in accordance with local/regional/national/international regulation.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	PEL	2 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Sodium hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Eye wash facilities and emergency shower must be available when handling this product. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection Splash proof chemical goggles. Face shield.

Skin protection

Hand protection The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present. Wear protective gloves. Suitable gloves can be recommended by the glove supplier.

Other Wear appropriate chemical resistant clothing.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Color Yellow to amber

Physical state Liquid

Odor Slight

Odor threshold Not available.

pH (concentrated product) 13

pH in aqueous solution 12.3 (5% SOL.)

Melting point/freezing point 25 °F (-4 °C)

Initial boiling point and boiling range 210 °F (99 °C)

Flash point > 200 °F (> 93 °C) P-M(CC)

Evaporation rate < 1 (Ether = 1)

Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1.08
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	6 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Pour point	30 °F (-1 °C)
Specific gravity	1.076
VOC	0 % (Calculated)

10. Stability and reactivity

Reactivity	May be corrosive to metals.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	None under normal conditions.
Incompatible materials	Avoid contact with strong acids and oxidisers. Strong acids. Strong oxidizing agents. Metals.
Hazardous decomposition products	Oxides of carbon and phosphorus evolved in fire.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Information on toxicological effects

Acute toxicity	May cause respiratory irritation.

Product	Species	Test Results
OPTISPERSE HTP73611 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg, (Calculated according to GHS additivity formula)
Inhalation		
LC50	Rat	> 5 mg/l, 4 Hours, (Calculated according to GHS additivity formula)
Oral		
LD50	Rat	> 5000 mg/kg, (Calculated according to GHS additivity formula)

Components	Species	Test Results
Sodium hydroxide (CAS 1310-73-2)		
Acute		
Dermal		
LD50	Rabbit	1350 mg/kg
Oral		
LD50	Rabbit	> 500 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Causes severe skin burns and eye damage.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization This product is not expected to cause respiratory sensitization.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Based on available data, the classification criteria are not met. Aspiration of this product may cause the same corrosiveness/irritation impacts as if it were ingested.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
OPTISPERSE HTP73611 (CAS Mixture)			
	NOEL	Fathead Minnow	5000 mg/L, Acute Toxicity, 96 hour, (Estimated)
Aquatic			
Crustacea	LC50	Daphnia magna	> 5000 mg/L, Acute Toxicity, 48 hour, (Estimated)

Product		Species	Test Results
	NOEL	Daphnia magna	3050 mg/L, Acute Toxicity, 48 hour, (Estimated)

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects Not available.

Persistence and degradability

- **COD (mgO2/g)** 56 (calculated data)
- **BOD 5 (mgO2/g)** 6 (calculated data)
- **BOD 28 (mgO2/g)** 6 (calculated data)
- **Closed Bottle Test (% Degradation in 28 days)** 11 (calculated data)
- **Zahn-Wellens Test (% Degradation in 28 days)** 18 (calculated data)
- **TOC (mg C/g)** 15 (calculated data)

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN1824
UN proper shipping name Sodium hydroxide solution, RQ(SODIUM HYDROXIDE, NICKEL)
Transport hazard class(es)
Class 8
Subsidiary risk -
Packing group II
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
ERG number 154
Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

UN number UN1824
UN proper shipping name Sodium hydroxide solution
Transport hazard class(es)
Class 8
Subsidiary risk -
Packing group II
Environmental hazards No.
ERG Code 154
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number UN1824
UN proper shipping name SODIUM HYDROXIDE SOLUTION, RQ(Sodium Hydroxide, Nickel)

Transport hazard class(es)

Class	8
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-B
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Sodium hydroxide (CAS 1310-73-2) Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

US state regulations

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

NICKEL (CAS 7440-02-0) Listed: October 1, 1989

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

US - Massachusetts RTK - Substance List

Sodium hydroxide (CAS 1310-73-2)

US - Pennsylvania RTK - Hazardous Substances

Sodium hydroxide (CAS 1310-73-2) Listed.

US - Rhode Island RTK

Sodium hydroxide (CAS 1310-73-2)

US. New Jersey Worker and Community Right-to-Know Act

Sodium hydroxide (CAS 1310-73-2) Listed.

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

16. Other information, including date of preparation or last revision

Issue date	Nov-25-2014
Revision date	Dec-17-2017
Version #	3.1
List of abbreviations	CAS: Chemical Abstract Service Registration Number TSRN indicates a Trade Secret Registry Number is used in place of the CAS number. ACGIH: American Conference of Governmental Industrial Hygienists NOEL: No Observed Effect Level STEL: Short Term Exposure Limit LC50: Lethal Concentration, 50% TWA: Time Weighted Average BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code LD50: Lethal Dose, 50% NFPA: National Fire Protection Association
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	Hazard(s) identification: Exempt from classification and labeling Hazard(s) identification: Response Exposure controls/personal protection: Exposure guidelines Transport Information: Material Transportation Information Other information, including date of preparation or last revision: Prepared by
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

* Trademark of SUEZ. May be registered in one or more countries.

SAFETY DATA SHEET
CORRSHIELD* MD4107

1. Identification

Product identifier **CORRSHIELD MD4107**

Other means of identification None.

Recommended use Closed system corrosion inhibitor

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Hazard symbol None.

Signal word None.

Hazard statement The mixture does not meet the criteria for classification. The material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard's (29CFR 1910.1200) implementation of the Globally Harmonized System (GHS), i.e., material is not a dangerous substance or mixture requiring GHS classification.

Precautionary statement

Prevention Observe good industrial hygiene practices.

Response Wash hands after handling.

Storage Store away from incompatible materials.

Disposal Dispose of contents/container to approved local facility.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

Composition comments Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact	Wash off with soap and water.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Cool containers / tanks with water spray.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Large Spills: Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Protect from freezing.

8. Exposure controls/personal protection

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Splash proof chemical goggles.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present.
Other	Wear suitable protective clothing.
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Color	Colorless
Physical state	Liquid
Odor	Mild
Odor threshold	Not available.
pH in aqueous solution	11.6 (5% SOL.)
Melting point/freezing point	16 °F (-9 °C)
Initial boiling point and boiling range	220 °F (104 °C)
Flash point	> 200 °F (> 93 °C) P-M(CC)
Evaporation rate	< 1 (Ether = 1)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1.4
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	17 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Pour point	21 °F (-6 °C)
Specific gravity	1.396
VOC	0 % (Estimated)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Avoid contact with strong acids and oxidisers.

Hazardous decomposition products	Elemental oxides

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful. May cause irritation to respiratory organs.
Skin contact	Prolonged or repeated contact may cause transient irritation.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	May cause gastrointestinal irritation.
Symptoms related to the physical, chemical and toxicological characteristics	Prolonged and repetitive exposure, depending on the route(s), may develop transient irritation on skin, eyes, ingestion tract, and/or respiratory tract.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
CORRSHIELD MD4107 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg, (Estimated value; 100% neat material rabbit dermal LD50: >1,000 mg/kg)
Inhalation		
LC50	Rat	> 5 mg/l, 4 Hours, (100% neat material maximum achievable concentration LC50: >8.68 mg/L/4hr)
Oral		
LD50	Rat	> 5000 mg/kg, (Estimated value; 100% neat material rat oral LD50: 2,810 mg/kg)

Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.
Respiratory or skin sensitization	
Respiratory sensitization	This product is not expected to cause respiratory sensitization.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	Not classified.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	May be harmful if swallowed and enters airways. Based on available data, the classification criteria are not met.
Chronic effects	Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
CORRSHIELD MD4107 (CAS Mixture)			
Aquatic			
Crustacea	LC50	Daphnia magna	9200 mg/L, Static Acute Bioassay, 48 hour
	NOEL	Daphnia magna	5140 mg/L, Static Acute Bioassay, 48 hour
Fish	LC50	Bluegill Sunfish	19400 mg/L, Static Acute Bioassay, 96 hour
		Fathead Minnow	21800 mg/L, Static Acute Bioassay, 96 hour
		Rainbow Trout	20970 mg/L, Static Acute Bioassay, 96 hour
	NOEL	Bluegill Sunfish	6850 mg/L, Static Acute Bioassay, 96 hour
		Fathead Minnow	16000 mg/L, Static Acute Bioassay, 96 hour
		Rainbow Trout	9140 mg/L, Static Acute Bioassay, 96 hour

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects Not available.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory information

US federal regulations This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

US state regulations

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

16. Other information, including date of preparation or last revision

Issue date Jan-30-2017

Revision date May-28-2019

Version # 2.0

NFPA ratings Health: 0
Flammability: 0
Instability: 0

NFPA ratings

List of abbreviations	CAS: Chemical Abstract Service Registration Number TSRN indicates a Trade Secret Registry Number is used in place of the CAS number. ACGIH: American Conference of Governmental Industrial Hygienists NOEL: No Observed Effect Level STEL: Short Term Exposure Limit LC50: Lethal Concentration, 50% LD50: Lethal Dose, 50% TWA: Time Weighted Average BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code NFPA: National Fire Protection Association
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	Hazard(s) identification: Hazard statement Composition/information on ingredients: Composition comments Accidental release measures: Methods and materials for containment and cleaning up Accidental release measures: Personal precautions, protective equipment and emergency procedures Handling and storage: Conditions for safe storage, including any incompatibilities Exposure controls/personal protection: Hand protection Stability and reactivity: Conditions to avoid Toxicological information: Carcinogenicity Regulatory information: California Prop 65 Other information, including date of preparation or last revision: List of abbreviations
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

SAFETY DATA SHEET
FLOGARD* MS6206

1. Identification

Product identifier **FLOGARD MS6206**

Other means of identification None.

Recommended use Corrosion inhibitor

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2B
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

OSHA defined hazards Not classified.

Label elements

Signal word Warning

Hazard statement May be corrosive to metals. Causes skin irritation. Causes eye irritation. May cause respiratory irritation.

Precautionary statement

Prevention Keep only in original container. Avoid breathing mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves.

Response IF ON SKIN: Wash with plenty of water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. Absorb spillage to prevent material-damage.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in a corrosion resistant container with a resistant inner liner.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
Dipotassium hydrogenorthophosphate	7758-11-4	20 - 40
Tetrapotassium pyrophosphate	7320-34-5	2.5 - 10

Composition comments Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact Remove contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.

Most important symptoms/effects, acute and delayed Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort. May cause respiratory irritation. Skin irritation. May cause redness and pain.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information If you feel unwell, seek medical advice (show the label where possible).

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Cool containers / tanks with water spray.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist or vapor. Do not touch or walk through spilled material. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Never return spills to original containers for re-use.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling Avoid contact with eyes, skin, and clothing. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Use care in handling/storage.

Conditions for safe storage, including any incompatibilities Store locked up. Store in a cool, dry place out of direct sunlight. Store in corrosive resistant container with a resistant inner liner. Store in original tightly closed container. Keep only in the original container. Store in accordance with local/regional/national/international regulation.

8. Exposure controls/personal protection

Occupational exposure limits This mixture has no ingredients that have PEL, TLV, or other recommended exposure limit.

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Eye wash fountain and emergency showers are recommended. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present.
Other	Wear appropriate chemical resistant clothing.
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Color	Colorless
Physical state	Liquid
Odor	None
Odor threshold	Not available.
pH (concentrated product)	8.8
pH in aqueous solution	7.8 (5% SOL.)
Melting point/freezing point	< 0 °F (< -18 °C)
Initial boiling point and boiling range	Not available.
Flash point	> 200 °F (> 93 °C) P-M(CC)
Evaporation rate	< 1 (Ether = 1)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1.53
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.

Viscosity	30 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Pour point	< 5 °F (< -15 °C)
Specific gravity	1.528
VOC	0 % (Estimated)

10. Stability and reactivity

Reactivity	May be corrosive to metals.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid temperatures exceeding the flash point. Contact with incompatible materials. None under normal conditions.
Incompatible materials	Strong oxidizing agents. Metals.
Hazardous decomposition products	Oxides of phosphorus evolved in fire. No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system.
Skin contact	Causes skin irritation.
Eye contact	Causes eye irritation.
Ingestion	Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics	Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort. May cause respiratory irritation. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
FLOGARD MS6206 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg, (Estimated value)
Oral		
LD50	Rat	> 5000 mg/kg, (Estimated value)

Components	Species	Test Results
Tetrapotassium pyrophosphate (CAS 7320-34-5)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Oral		
LD50	Rat	2440 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Causes eye irritation.
Respiratory or skin sensitization	
Respiratory sensitization	This product is not expected to cause respiratory sensitization.
Skin sensitization	This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Based on available data, the classification criteria are not met.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
FLOGARD MS6206 (CAS Mixture)			
Aquatic			
Crustacea	LC50	Daphnia magna	1275 mg/L, Static Renewal Bioassay, 48 hour
		Mysid Shrimp	724 mg/L, Static Renewal Bioassay, 48 hour
	NOEL	Daphnia magna	500 mg/L, Static Renewal Bioassay, 48 hour
		Mysid Shrimp	155 mg/L, Static Renewal Bioassay, 48 hour
Fish	LC50	Fathead Minnow	1740 mg/L, Static Renewal Bioassay, 96 hour
		Rainbow Trout	> 1000 mg/L, Acute Toxicity, 96 hour, (Estimated)
	NOEL	Fathead Minnow	1000 mg/L, Static Renewal Bioassay, 96 hour

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects Not available.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN3266

UN proper shipping name Corrosive liquid, basic, inorganic, n.o.s. (TETRA POTASSIUM PYROPHOSPHATE)

Transport hazard class(es)

Class	8
Subsidiary risk	-

Packing group III
Special precautions for user Not available.
ERG number 154
Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

UN number UN3266
UN proper shipping name CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (Tetrapotassium pyrophosphate)
Transport hazard class(es)

Class	8
Subsidiary risk	-

Packing group III
Environmental hazards No.
ERG Code 154
Special precautions for user Not available.

IMDG

UN number UN3266
UN proper shipping name CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (Tetrapotassium pyrophosphate)
Transport hazard class(es)

Class	8
Subsidiary risk	-

Packing group III
Environmental hazards

Marine pollutant	No.

EmS F-A, S-B
Special precautions for user Not available.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	Yes
Classified hazard categories	Corrosive to metal Skin corrosion or irritation Serious eye damage or eye irritation Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Food and drug administration	21 CFR 176.170 (components of paper and paperboard in contact with aqueous and fatty foods)

US state regulations

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

16. Other information, including date of preparation or last revision

Issue date	Oct-10-2014
Revision date	Apr-25-2019
Version #	3.0
NFPA ratings	Health: 2 Flammability: 0 Instability: 0
NFPA ratings	

List of abbreviations	CAS: Chemical Abstract Service Registration Number TSRN indicates a Trade Secret Registry Number is used in place of the CAS number. ACGIH: American Conference of Governmental Industrial Hygienists NOEL: No Observed Effect Level STEL: Short Term Exposure Limit LC50: Lethal Concentration, 50% LD50: Lethal Dose, 50% TWA: Time Weighted Average BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	Hazard(s) identification: Response Composition / Information on Ingredients: Disclosure Overrides Composition/information on ingredients: Composition comments First-aid measures: Inhalation Accidental release measures: Personal precautions, protective equipment and emergency procedures Handling and storage: Precautions for safe handling Handling and storage: Conditions for safe storage, including any incompatibilities Exposure controls/personal protection: Appropriate engineering controls Stability and reactivity: Conditions to avoid Transport Information: Material Transportation Information Regulatory information: California Prop 65 Regulatory information: US state regulations Other information, including date of preparation or last revision: Bibliography GHS: Classification
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

SAFETY DATA SHEET
STEAMATE* NA8580

1. Identification

Product identifier **STEAMATE NA8580**

Other means of identification None.

Recommended use Steam condensate treatment.

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 3
Health hazards	Acute toxicity, oral	Category 4
	Acute toxicity, dermal	Category 4
	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
	Sensitization, skin	Category 1
	Carcinogenicity	Category 2
	Reproductive toxicity	Category 2
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement Flammable liquid and vapor. Harmful if swallowed. Harmful in contact with skin. Causes severe skin burns and eye damage. May cause an allergic skin reaction. Causes serious eye damage. May cause respiratory irritation. Suspected of causing cancer. Suspected of damaging fertility or the unborn child.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep container tightly closed. Use explosion-proof electrical/ventilating/lighting equipment. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.

Response	If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. In case of fire: Use appropriate media to extinguish.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
Ethanolamine	141-43-5	40 - 60
Cyclohexylamine	108-91-8	2.5 - 10
Dimethylaminopropylamine (DMAPA)	109-55-7	2.5 - 10
Diethanolamine	111-42-2	0.1 - 1

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments	Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.
Ingestion	Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Call a physician or poison control center immediately. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Most important symptoms/effects, acute and delayed	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.
General information	Take off all contaminated clothing immediately. IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Alcohol resistant foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Cool containers / tanks with water spray.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Use water spray to reduce vapors or divert vapor cloud drift. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Avoid prolonged exposure. When using, do not eat, drink or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Wash contaminated clothing before reuse. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS). Store in accordance with local/regional/national/international regulation.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Ethanolamine (CAS 141-43-5)	PEL	6 mg/m3
		3 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Cyclohexylamine (CAS 108-91-8)	TWA	10 ppm	
Diethanolamine (CAS 111-42-2)	TWA	1 mg/m3	Inhalable fraction and vapor.
Ethanolamine (CAS 141-43-5)	STEL	6 ppm	
	TWA	3 ppm	

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Cyclohexylamine (CAS 108-91-8)	TWA	40 mg/m3
		10 ppm
Diethanolamine (CAS 111-42-2)	TWA	15 mg/m3
		3 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Ethanolamine (CAS 141-43-5)	STEL	15 mg/m3
		6 ppm
	TWA	8 mg/m3
		3 ppm

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines

US ACGIH Threshold Limit Values: Skin designation

Diethanolamine (CAS 111-42-2) Can be absorbed through the skin.

Appropriate engineering controls Explosion-proof general and local exhaust ventilation. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Hand protection Wear appropriate chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Suitable gloves can be recommended by the glove supplier. Glove selection must take into account any solvents and other hazards present.

Other Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection Chemical respirator with organic vapor cartridge and full facepiece. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

9. Physical and chemical properties

Appearance

Color Colorless to yellow

Physical state Liquid

Odor Strong odor

Odor threshold Not available.

pH (concentrated product) 13.3 Neat

Melting point/freezing point < -10 °F (< -23 °C)

Initial boiling point and boiling range 212 °F (100 °C)

Flash point 126 °F (52 °C) SETA(CC)

Evaporation rate Slower than Ether

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure 18 mmHg

Vapor pressure temp. 70 °F (21 °C)

Vapor density > 1

Relative density 1

Relative density temperature 70 °F (21 °C)

Solubility(ies)

Solubility (water) 100 %

Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	24 mPa.s
Viscosity temperature	70 °F (21 °C)
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Specific gravity	0.999
VOC	62 % CALCULATED

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Avoid contact with strong acids. Contact with incompatible materials.
Incompatible materials	Strong acids. Strong oxidizing agents.
Hazardous decomposition products	Oxides of carbon and nitrogen evolved in fire.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact	Causes severe skin burns. Harmful in contact with skin. May cause an allergic skin reaction. Prolonged or repeated exposure may cause liver and kidney damage. These effects have not been observed in humans.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns. Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Information on toxicological effects

Acute toxicity Harmful in contact with skin. Harmful if swallowed. May cause respiratory irritation. May cause an allergic skin reaction.

Product	Species	Test Results
STEAMATE NA8580 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	1184 mg/kg, (Calculated according to GHS additivity formula (Category 4))
Inhalation		
LC50	Rat	> 20 mg/l, 4 Hours, (Calculated according to GHS additivity formula)
Oral		
LD50	Rat	895 mg/kg, (Calculated according to GHS additivity formula (Category 4))

Components	Species	Test Results
Cyclohexylamine (CAS 108-91-8)		
Acute		
Dermal		
LD50	Rabbit	277 mg/kg

Components	Species	Test Results
Oral		
LD50	Rat	156 mg/kg
Diethanolamine (CAS 111-42-2)		
Acute		
Dermal		
LD50	Rabbit	4000 mg/kg
Oral		
LD50	Rat	1600 mg/kg
Dimethylaminopropylamine (DMAPA) (CAS 109-55-7)		
Acute		
Inhalation		
LC50	Rat	> 4.3 mg/l, 4 Hour
Oral		
LD50	Rat	410 mg/kg
Ethanolamine (CAS 141-43-5)		
Acute		
Dermal		
LD50	Rabbit	1025 mg/kg
Inhalation		
LC50	Rat	> 1.5 mg/l, 4 Hour
Oral		
LD50	Rat	1720 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Causes severe skin burns and eye damage.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization This product is not expected to cause respiratory sensitization.

Skin sensitization May cause an allergic skin reaction.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Suspected of causing cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Diethanolamine (CAS 111-42-2) 2B Possibly carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity Suspected of damaging fertility or the unborn child.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not classified.

Chronic effects May be harmful if absorbed through skin. Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

Prolonged or repeated exposure may cause liver and kidney damage. These effects have not been observed in humans.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
STEAMATE NA8580 (CAS Mixture)			
	LC50	Fathead Minnow	208 mg/l, Static Renewal Bioassay, 96 hour, (pH adjusted)
	NOEL	Fathead Minnow	100 mg/l, Static Renewal Bioassay, 96 hour, (pH adjusted)
Aquatic			
Crustacea	LC50	Daphnia magna	174.1 mg/l, Static Renewal Bioassay, 48 hour, (pH adjusted)
	NOEL	Daphnia magna	100 mg/l, Static Renewal Bioassay, 48 hour, (pH adjusted)

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)	
Cyclohexylamine	1.49
Diethanolamine	-1.43
Ethanolamine	-1.31
Bioconcentration factor (BCF)	
Diethanolamine	3
Ethanolamine	3

Mobility in soil No data available.

Other adverse effects Not available.

Persistence and degradability

- COD (mgO2/g)	973 (calculated data)
- BOD 5 (mgO2/g)	257 (calculated data)
- BOD 28 (mgO2/g)	265 (calculated data)
- Closed Bottle Test (% Degradation in 28 days)	30 (calculated data)
- Zahn-Wellens Test (% Degradation in 28 days)	78 (calculated data)
- TOC (mg C/g)	278 (calculated data)

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Do not incinerate sealed containers. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code D001: Waste Flammable material with a flash point <140 F
D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN2734

UN proper shipping name Amines, liquid, corrosive, flammable, n.o.s. (Ethanolamine, CYCLOHEXYLAMINE), RQ(Diethanolamine, Aniline (Benzenamine))

Transport hazard class(es)

Class 8

Subsidiary risk 3

Packing group II
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
ERG number 132
Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

UN number UN2734
UN proper shipping name Amines, liquid, corrosive, flammable, n.o.s. (Ethanolamine, CYCLOHEXYLAMINE)
Transport hazard class(es)
Class 8
Subsidiary risk 3
Packing group II
Environmental hazards No.
ERG Code 132
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number UN2734
UN proper shipping name AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. (ETHANOLAMINE, CYCLOHEXYLAMINE), RQ(Diethanolamine, Aniline (Benzenamine))
Transport hazard class(es)
Class 8
Subsidiary risk 3
Packing group II
Environmental hazards
Marine pollutant No.
EmS F-E, S-C
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Diethanolamine (CAS 111-42-2) Listed.

SARA 304 Emergency release notification

Cyclohexylamine (CAS 108-91-8) 10000 LBS

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
Cyclohexylamine	108-91-8	10000	10000		

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Diethanolamine	111-42-2	0.1 - 1

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Diethanolamine (CAS 111-42-2)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Cyclohexylamine (CAS 108-91-8)

Safe Drinking Water Act (SDWA) Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

US state regulations

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Aniline (CAS 62-53-3) Listed: January 1, 1990
Diethanolamine (CAS 111-42-2) Listed: June 22, 2012

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

US - Massachusetts RTK - Substance List

Cyclohexylamine (CAS 108-91-8)
Diethanolamine (CAS 111-42-2)
Dimethylaminopropylamine (DMAPA) (CAS 109-55-7)
Ethanolamine (CAS 141-43-5)

US - Pennsylvania RTK - Hazardous Substances

Cyclohexylamine (CAS 108-91-8) Listed.
Diethanolamine (CAS 111-42-2) Listed.
Dimethylaminopropylamine (DMAPA) (CAS 109-55-7) Listed.
Ethanolamine (CAS 141-43-5) Listed.

US - Rhode Island RTK

Cyclohexylamine (CAS 108-91-8)
Diethanolamine (CAS 111-42-2)
Ethanolamine (CAS 141-43-5)

US. New Jersey Worker and Community Right-to-Know Act

Cyclohexylamine (CAS 108-91-8)	Listed.
Diethanolamine (CAS 111-42-2)	Listed.
Dimethylaminopropylamine (DMAPA) (CAS 109-55-7)	Listed.
Ethanolamine (CAS 141-43-5)	Listed.

US. Pennsylvania Worker and Community Right-to-Know Law

Dimethylaminopropylamine (DMAPA) (CAS 109-55-7)	Hazardous substance
Ethanolamine (CAS 141-43-5)	Hazardous substance

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

16. Other information, including date of preparation or last revision

Issue date	Oct-21-2014
Revision date	May-27-2018
Version #	5.2
List of abbreviations	CAS: Chemical Abstract Service Registration Number TSRN indicates a Trade Secret Registry Number is used in place of the CAS number. ACGIH: American Conference of Governmental Industrial Hygienists NOEL: No Observed Effect Level STEL: Short Term Exposure Limit LC50: Lethal Concentration, 50% TWA: Time Weighted Average BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code LD50: Lethal Dose, 50%
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	Other information, including date of preparation or last revision: Disclaimer
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

SAFETY DATA SHEET
SPECTRUS* NX1102

1. Identification

Product identifier **SPECTRUS NX1102**

Other means of identification None.

Recommended use Solvent-based microbial control agent.

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity, oral	Category 4
	Acute toxicity, inhalation	Category 4
	Skin corrosion/irritation	Category 1
	Serious eye damage/eye irritation	Category 1
	Sensitization, skin	Category 1

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May be corrosive to metals. Harmful if swallowed. Causes severe skin burns and eye damage. May cause an allergic skin reaction. Causes serious eye damage. Harmful if inhaled.

Precautionary statement

Prevention Keep only in original container. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing must not be allowed out of the workplace. Wear eye protection/face protection. Wear protective gloves.

Response If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse. Absorb spillage to prevent material damage.

Storage Store locked up. Store in corrosive resistant container with a resistant inner liner.

Disposal Dispose of contents/container to an approved facility.

Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
2,2-dibromo-3-nitrilopropionamide	10222-01-2	20 - 40
Sodium bromide	7647-15-6	2.5 - 10

Composition comments Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

Most important symptoms/effects, acute and delayed Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media Carbon dioxide, dry chemicals, foam, water spray (fog).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Cool containers / tanks with water spray.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up

Prevent entry into waterways, sewer, basements or confined areas.

Large Spills: Stop the flow of material, if this is without risk. Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Neutralize the spilled material before disposal. Neutralize with approximately 17.2 grams sodium bisulfite or 15.7 grams sodium metabisulfite for every 100 grams biocide product.

Never return spills to original containers for re-use.

Environmental precautions

Avoid discharge into drains, water courses or onto the ground. Water contaminated with this product may be sent to a sanitary sewer treatment facility, or a permitted waste treatment facility, in accordance with any local agreements.

7. Handling and storage

Precautions for safe handling

Do not breathe mist or vapor. Do not taste or swallow. Do not mix with alkaline material. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Do not get in eyes, on skin, or on clothing. Avoid prolonged exposure. Use care in handling/storage.

Conditions for safe storage, including any incompatibilities

Store locked up. Store in a cool, dry place out of direct sunlight. Store in corrosive resistant container with a resistant inner liner. Keep only in the original container. Store in a well-ventilated place. Store in accordance with local/regional/national/international regulation.

8. Exposure controls/personal protection

Occupational exposure limits

US. Workplace Environmental Exposure Level (WEEL) Guides

Components	Type	Value	Form
Poly(oxy-1,2-ethanediyl),α-hydro-ω-hydroxy-Ethane-1,2-diol, ethoxylated (CAS 25322-68-3)	TWA	10 mg/m3	Particulate.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Hand protection

USERS OF A PESTICIDAL PRODUCT SHOULD REFER TO THE PRODUCT LABEL FOR PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS.
Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier. Glove selection must take into account any solvents and other hazards present.

Other

Wear appropriate chemical resistant clothing. Wash off after each use. Replace as necessary.

Respiratory protection

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance

Color Yellow to amber

Physical state Liquid

Odor Slight

Odor threshold Not available.

pH (concentrated product) 1.9 Neat

pH in aqueous solution 3.3 (5% Solution)

Melting point/freezing point	-0.04 °F (-18 °C)
Initial boiling point and boiling range	Not available.
Flash point	Not applicable.
Evaporation rate	Slower than Ether
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	< 0.1 mmHg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	> 1
Relative density	1.27
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	64 mPa.s
Viscosity temperature	70 °F (21 °C)
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Pour point	5 °F (-15 °C)
Specific gravity	1.269
VOC	0 % CALCULATED

10. Stability and reactivity

Reactivity	May be corrosive to metals.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Keep away from heat. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents. Metals. Contact with strong bases may cause a violent reaction releasing heat.
Hazardous decomposition products	Carbon dioxide, bromine, cyanogen bromide, dibromoacetonitrile

11. Toxicological information

Information on likely routes of exposure

Inhalation	Harmful if inhaled.
Skin contact	Causes severe skin burns. May cause an allergic skin reaction.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns. Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Information on toxicological effects

Acute toxicity Harmful if swallowed. May cause an allergic skin reaction.

Product	Species	Test Results
SPECTRUS NX1102 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg, (Calculated according to GHS additivity formula)
Inhalation		
LC50	Rat	1.3 mg/l, 4 hours, (Calculated according to GHS additivity formula)
Oral		
LD50	Rat	510 mg/kg, (Calculated according to GHS additivity formula)

Components	Species	Test Results
2,2-dibromo-3-nitrilopropionamide (CAS 10222-01-2)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	0.32 mg/l, 4 Hour
Oral		
LD50	Rat	206 mg/kg
Sodium bromide (CAS 7647-15-6)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Oral		
LD50	Rat	4200 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Causes skin burns.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization This product is not expected to cause respiratory sensitization.

Skin sensitization May cause an allergic skin reaction.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Carcinogenic effects are not expected as a result of occupational exposure.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Based on available data, the classification criteria are not met. May be harmful if swallowed and enters airways.

Chronic effects Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
SPECTRUS NX1102 (CAS Mixture)			
Aquatic			
Algae	ErC50	Algae	1.5 mg/l, Growth Inhibition, 72 hours
Crustacea	EC50	Daphnia magna	2.5 mg/l, Static Acute Bioassay, 48 hours
Fish	LC50	Rainbow Trout	3.6 mg/l, Static Acute Bioassay, 96 hours

Persistence and degradability 78 % degradation in 28 days
CO2 Evolution (Modified Sturm Test) (OECD 301B)
(Refers to active component: 2,2-dibromo-3-nitrilopropionamide)

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)
2,2-dibromo-3-nitrilopropionamide 0.79

Bioconcentration factor (BCF)
2,2-dibromo-3-nitrilopropionamide 13
Species: Fish

Mobility in soil No data available.

Other adverse effects Nutrients: N= 53,2 mg/g

Persistence and degradability

- **COD (mgO2/g)** 959
- **BOD 5 (mgO2/g)** 0 (calculated data)
- **BOD 28 (mgO2/g)** 0 (calculated data)
- **Closed Bottle Test (% Degradation in 28 days)** 0
- **Zahn-Wellens Test (% Degradation in 28 days)** 0
- **TOC (mg C/g)** 732
- **CO2 evolution (modified Sturm test)** 78

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of in approved pesticide facility or according to label instructions. Incinerate the material under controlled conditions in an approved incinerator.

Hazardous waste code D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number UN3265
UN proper shipping name Corrosive liquid, acidic, organic, n.o.s. (DBNPA (2,2-DIBROMO-3-NITRILOPROPIONAMIDE))
Transport hazard class(es)
Class 8
Subsidiary risk -
Packing group III
Special precautions for user Not available.
ERG number 153
Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

UN number	UN3265
UN proper shipping name	Corrosive liquid, acidic, organic, n.o.s. (DBNPA (2,2-DIBROMO-3-NITRILOPROPIONAMIDE))
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	No.
ERG Code	153
Special precautions for user	Not available.

IMDG

UN number	UN3265
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (DBNPA (2,2-DIBROMO-3-NITRILOPROPIONAMIDE))
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-B
Special precautions for user	Not available.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
This is an EPA registered biocide and is exempt from TSCA inventory requirements. See FIFRA registry number.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

Classified hazard categories
Corrosive to metal
Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitization

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130) Hazardous substance

Safe Drinking Water Act (SDWA) Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

FIFRA registration number 3876-95

TSCA This is an EPA registered biocide and is exempt from TSCA inventory requirements.

FIFRA hazard statement This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

DANGER
Corrosive
Causes irreversible eye damage
Harmful if inhaled, swallowed, or absorbed through the skin
Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals
This pesticide is toxic to fish and aquatic organisms

Food and drug administration The ingredients in this product are approved by FDA under 21 CFR 176.300.

NSF Registered and/or meets USDA (according to 1998 guidelines): Registration No. – 140725
Category Code(s):
G7 Boiler, steam line treatment products – nonfood contact

US state regulations

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

16. Other information, including date of preparation or last revision

Issue date	Oct-17-2014
Revision date	Feb-01-2019
Version #	3.0
NFPA ratings	Health: 3 Flammability: 0 Instability: 0
NFPA ratings	
List of abbreviations	CAS: Chemical Abstract Service Registration Number TWA: Time Weighted Average STEL: Short Term Exposure Limit LD50: Lethal Dose, 50% LC50: Lethal Concentration, 50% EC50: Effect Concentration, 50% NOEL: No Observed Effect Level COD: Chemical Oxygen Demand BOD: Biochemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code ACGIH: American Conference of Governmental Industrial Hygienists TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	Hazard(s) identification: Supplemental information Regulatory information: California Prop 65
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

* Trademark of SUEZ. May be registered in one or more countries.

SAFETY DATA SHEET
CORTROL* OS7785

1. Identification

Product identifier	**CORTROL OS7785**
Other means of identification	None.
Recommended use	Water based dissolved oxygen scavenger/ metal passivator.
Recommended restrictions	None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Serious eye damage/eye irritation	Category 1
	Sensitization, skin	Category 1
	Germ cell mutagenicity	Category 2
	Carcinogenicity	Category 2
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
OSHA defined hazards	Not classified.	

Label elements

Signal word	Danger
Hazard statement	May cause an allergic skin reaction. Causes serious eye damage. May cause respiratory irritation. Suspected of causing genetic defects. Suspected of causing cancer.
Precautionary statement	
Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing mist or vapor. Use only outdoors or in a well-ventilated area. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection.
Response	If on skin: Wash with plenty of water/. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor/. Specific treatment (see this label). If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container to approved local facility.

Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
Hydroquinone	123-31-9	2.5 - 10

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments	Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Ingestion	Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.
Most important symptoms/effects, acute and delayed	Dermatitis. Rash. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. May cause an allergic skin reaction.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of vapors or mists. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Prevent entry into waterways, sewer, basements or confined areas. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get this material in contact with eyes. Avoid breathing mist or vapor. Avoid contact with skin. Avoid contact with clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store locked up. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Store containers closed when not in use. Store in accordance with local/regional/national/international regulation. Minimise exposure to light.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Hydroquinone (CAS 123-31-9)	PEL	2 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value
Hydroquinone (CAS 123-31-9)	TWA	1 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Hydroquinone (CAS 123-31-9)	Ceiling	2 mg/m3

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station.

Individual protection measures, such as personal protective equipment

Eye/face protection

Splash proof chemical goggles. Face shield.

Skin protection

Hand protection

Chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present.

Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection

Chemical respirator with organic vapor cartridge and full facepiece. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance

Color Brown to light yellow

Physical state Liquid

Odor Slight

Odor threshold Not available.

pH (concentrated product) 7.5

pH in aqueous solution 7.6 (5% SOL.)

Melting point/freezing point 32 °F (0 °C)

Initial boiling point and boiling range 212 °F (100 °C)

Flash point	> 212 °F (> 100 °C) SETA(CC)
Evaporation rate	< 1 (Ether = 1)
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	7 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Pour point	37 °F (3 °C)
Specific gravity	1.002
VOC	0 % (Estimated)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Protect from freezing.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Oxides of carbon evolved in fire.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact	May cause an allergic skin reaction. Prolonged or repeated contact may cause irritation.
Eye contact	Causes serious eye damage.
Ingestion	May cause gastrointestinal irritation.
Symptoms related to the physical, chemical and toxicological characteristics	Dermatitis. Rash. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. May cause an allergic skin reaction.

Information on toxicological effects

Acute toxicity	May cause respiratory irritation. May cause an allergic skin reaction.

Product	Species	Test Results
CORTROL OS7785 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg, (Calculated according to GHS additivity formula)
Oral		
LD50	Rat	> 5000 mg/kg, (Calculated according to GHS additivity formula)

Components	Species	Test Results
Hydroquinone (CAS 123-31-9)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Oral		
LD50	Rat	367 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

ACGIH sensitization

HYDROQUINONE (CAS 123-31-9) Dermal sensitization

Respiratory sensitization Not available.

Skin sensitization May cause an allergic skin reaction.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Hydroquinone (CAS 123-31-9) 3 Not classifiable as to carcinogenicity to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard May be harmful if swallowed and enters airways. Based on available data, the classification criteria are not met.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
CORTROL OS7785 (CAS Mixture)			
	5% Mortality	Mysid Shrimp	3.7 mg/L, Static Renewal Bioassay, 48 hour
	LC50	Fathead Minnow	4.2 mg/L, Static Renewal Bioassay, 96 hour
		Mysid Shrimp	15 mg/L, Static Renewal Bioassay, 48 hour

Product		Species	Test Results
		Sheepshead Minnow	5.5 mg/L, Static Renewal Bioassay, 96 hour
	NOEL	Fathead Minnow	1.5 mg/L, Static Renewal Bioassay, 96 hour
		Sheepshead Minnow	3.7 mg/L, Static Renewal Bioassay, 96 hour
Aquatic			
Crustacea	LC50	Daphnia magna	4.2 mg/L, Static Renewal Bioassay, 48 hour
	NOEL	Daphnia magna	1.5 mg/L, Static Renewal Bioassay, 48 hour
Fish	LC50	Rainbow Trout	2.4 mg/L, Static Acute Bioassay, 96 hour

Bioaccumulative potential No data available.

Partition coefficient n-octanol / water (log Kow)

Hydroquinone	0.59

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

Environmental fate The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability

No data is available on the degradability of this product.

- COD (mgO2/g)	83 (calculated data)
- BOD 5 (mgO2/g)	43 (calculated data)
- BOD 28 (mgO2/g)	43 (calculated data)
- Closed Bottle Test (% Degradation in 28 days)	25 (calculated data)
- Zahn-Wellens Test (% Degradation in 28 days)	66 (calculated data)
- TOC (mg C/g)	26 (calculated data)

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN3082

UN proper shipping name Environmentally hazardous substance, liquid, n.o.s. (HYDROQUINONE (1,4-BENZENEDIOL)), RQ(HYDROQUINONE (1,4-BENZENEDIOL), SODIUM HYDROXIDE)

Transport hazard class(es)

Class 9

Subsidiary risk -

Packing group III

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

ERG number 171

Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

UN number	UN3082
UN proper shipping name	Environmentally hazardous substance, liquid, n.o.s. (HYDROQUINONE (1,4-BENZENEDIOL))
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III
Environmental hazards	Yes
ERG Code	171
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN3082
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (HYDROQUINONE (1,4-BENZENEDIOL)), RQ(HYDROQUINONE (1,4-BENZENEDIOL), SODIUM HYDROXIDE), MARINE POLLUTANT
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	Yes
EmS	F-A, S-F
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

DOT

IATA; IMDG

Marine pollutant

General information IMDG Regulated Marine Pollutant.

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Hydroquinone (CAS 123-31-9) Listed.

SARA 304 Emergency release notification

Hydroquinone (CAS 123-31-9) 100 LBS

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
Hydroquinone	123-31-9	100		500	10000

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Hydroquinone	123-31-9	2.5 - 10

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Hydroquinone (CAS 123-31-9)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Food and drug administration All ingredients in this product are authorized in 21 CFR176.170 for use in boilers where the steam will be used for manufacturing paper or paperboard.

US state regulations California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

US - Massachusetts RTK - Substance List

Hydroquinone (CAS 123-31-9)

US - Pennsylvania RTK - Hazardous Substances

Hydroquinone (CAS 123-31-9)	Listed.

US - Rhode Island RTK

Hydroquinone (CAS 123-31-9)

US. New Jersey Worker and Community Right-to-Know Act

Hydroquinone (CAS 123-31-9)	Listed.

US. Pennsylvania Worker and Community Right-to-Know Law

Hydroquinone (CAS 123-31-9)	Hazardous substance

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

16. Other information, including date of preparation or last revision

Issue date	Dec-05-2014
Revision date	Dec-16-2017
Version #	1.1
List of abbreviations	CAS: Chemical Abstract Service Registration Number TWA: Time Weighted Average STEL: Short Term Exposure Limit LD50: Lethal Dose, 50% LC50: Lethal Concentration, 50% NOEL: No Observed Effect Level COD: Chemical Oxygen Demand BOD: Biochemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code NFPA: National Fire Protection Association ACGIH: American Conference of Governmental Industrial Hygienists TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	This document has undergone significant changes and should be reviewed in its entirety.
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

SAFETY DATA SHEET
KLARAID* PC1192

1. Identification

Product identifier **KLARAID PC1192**

Other means of identification None.

Recommended use Coagulant

Recommended restrictions None known.

Company/undertaking identification

SUEZ WTS USA, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355 3300, F 215 953 5524

Emergency telephone

(800) 877 1940

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Serious eye damage/eye irritation Category 2

OSHA defined hazards Not classified.

Label elements

Signal word Warning

Hazard statement Causes serious eye irritation.

Precautionary statement

Prevention Wear eye/face protection. Wash thoroughly after handling.

Response If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Storage Store away from incompatible materials.

Disposal Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Components	CAS #	Percent
N,N-Dimethyl-N-2-propenyl-2-propen- 1-amonium chloride homopolymer	26062-79-3	10 - 20

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments	Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this SDS for our assessment of the potential hazards of this formulation.

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Symptoms may include stinging, tearing, redness, swelling, and blurred vision.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Cool containers / tanks with water spray.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Prevent entry into waterways, sewer, basements or confined areas. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground. Water contaminated with this product may be sent to a sanitary sewer treatment facility, or a permitted waste treatment facility, in accordance with any local agreements.

7. Handling and storage

Precautions for safe handling	Avoid contact with eyes. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Protect from freezing. If frozen, thaw completely and mix thoroughly prior to use.

8. Exposure controls/personal protection

Occupational exposure limits	This mixture has no ingredients that have PEL, TLV, or other recommended exposure limit.
Biological limit values	No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Chemical resistant gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Glove selection must take into account any solvents and other hazards present.
Other	Wear suitable protective clothing.
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Color	Yellow
Physical state	Liquid
Odor	Mild
Odor threshold	Not available.
pH (concentrated product)	6.3
pH in aqueous solution	6.2 (5% SOL.)
Melting point/freezing point	30 °F (-1 °C)
Initial boiling point and boiling range	Not available.
Flash point	Not applicable.
Evaporation rate	< 1 (Ether = 1)
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	18 mm Hg
Vapor pressure temp.	70 °F (21 °C)
Vapor density	< 1 (Air = 1)
Relative density	1.03
Relative density temperature	70 °F (21 °C)
Solubility(ies)	
Solubility (water)	100 %
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.

Decomposition temperature	Not available.
Viscosity	168 cps
Viscosity temperature	70 °F (21 °C)
Other information	
Pour point	35 °F (2 °C)
Specific gravity	1.032
VOC	0 % (ASTM 3960-93)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Hydrogen chloride, oxides of carbon and nitrogen evolved in fire.

11. Toxicological information

Information on likely routes of exposure

Inhalation	No adverse effects due to inhalation are expected.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Causes serious eye irritation.
Ingestion	Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics	Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
KLARAID PC1192 (CAS Mixture)		
Acute		
Oral		
LD50	Rat	> 5000 mg/kg, (Calculated according to GHS additivity formula)

Components	Species	Test Results
N,N-Dimethyl-N-2-propenyl-2-propen- 1-amonium chloride homopolymer (CAS 26062-79-3)		
Acute		
Oral		
LD50	Rat	3000 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization	This product is not expected to cause respiratory sensitization.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Based on available data, the classification criteria are not met.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
KLARAID PC1192 (CAS Mixture)			
	LC50	Ceriodaphnia	9.3 mg/l, Static Acute Bioassay, 48 hour, (With Humic Acid)
		Fathead Minnow	3.8 mg/l, Static Acute Bioassay, 96 hour, (With Humic Acid)
		Mysid Shrimp	628.5 mg/l, Static Renewal Bioassay, 48 hour
	LOEL	Ceriodaphnia	2 mg/l, Chronic Bioassay, 7 day
		Fathead Minnow	2 mg/l, Chronic Bioassay, 7 day
	NOEL	Ceriodaphnia	6.25 mg/l, Static Acute Bioassay, 48 hour, (With Humic Acid)
			1 mg/l, Chronic Bioassay, 7 day
		Fathead Minnow	2.5 mg/l, Static Acute Bioassay, 96 hour, (With Humic Acid)
			1 mg/l, Chronic Bioassay, 7 day
		Mysid Shrimp	125 mg/l, Static Renewal Bioassay, 48 hour
		Sheepshead Minnow	2000 mg/l, Static Renewal Bioassay, 96 hour
Aquatic			
Crustacea	LC50	Daphnia magna	32 mg/l, Static Acute Bioassay, 48 hour, (With Humic Acid)
	NOEL	Daphnia magna	15.6 mg/l, Static Acute Bioassay, 48 hour, (With Humic Acid)
Fish	LC50	Rainbow Trout	14.1 mg/l, Static Acute Bioassay, 96 hour, (With Humic Acid)
	NOEL	Rainbow Trout	10 mg/l, Static Acute Bioassay, 96 hour, (With Humic Acid)

Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	Not available.

Persistence and degradability

- COD (mgO2/g)	270
- BOD 5 (mgO2/g)	0
- BOD 28 (mgO2/g)	7
- Closed Bottle Test (% Degradation in 28 days)	3
- Zahn-Wellens Test (% Degradation in 28 days)	6
- TOC (mg C/g)	90

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

Some containers may be exempt from Dangerous Goods/Hazmat Transport Regulations, please check BOL for exact container classification.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Food and drug administration 21 CFR 176.170 (components of paper and paperboard in contact with aqueous and fatty foods)

US state regulations

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

No ingredient listed.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

No ingredient listed.

US - Massachusetts RTK - Substance List

Not regulated.

US - Pennsylvania RTK - Hazardous Substances

Not regulated.

US - Rhode Island RTK

Not regulated.

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

16. Other information, including date of preparation or last revision

Issue date	Oct-20-2014
Revision date	Dec-16-2017
Version #	3.1
List of abbreviations	CAS: Chemical Abstract Service Registration Number ACGIH: American Conference of Governmental Industrial Hygienists TWA: Time Weighted Average STEL: Short Term Exposure Limit LD50: Lethal Dose, 50% LC50: Lethal Concentration, 50% NOEL: No Observed Effect Level COD: Chemical Oxygen Demand BOD: Biochemical Oxygen Demand TOC: Total Organic Carbon IATA: International Air Transport Association IMDG: International Maritime Dangerous Goods Code TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.
References:	No data available
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	This document has undergone significant changes and should be reviewed in its entirety.
Prepared by	This SDS has been prepared by SUEZ Regulatory Department (1-215-355-3300).

* Trademark of SUEZ. May be registered in one or more countries.

BRENNTAG

SAFETY DATA SHEET

1. Identification

Product identifier **SODIUM HYPOCHLORITE 12.5%**

Other means of identification None.

Recommended use ALL PROPER AND LEGAL PURPOSES

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name Brenntag Southwest, Inc.

Address 610 Fisher Road
Longview, TX 75604

Telephone 903-759-7151

E-mail Not available.

Emergency phone number 800-424-9300 CHEMTREC

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Skin corrosion/irritation Category 1

Serious eye damage/eye irritation Category 1

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement Causes severe skin burns and eye damage. Causes serious eye damage.

Precautionary statement

Prevention Do not breathe mist or vapor. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection.

Response If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse.

Storage Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
HYPOCHLOROUS ACID, SODIUM SALT (1:1)		7681-52-9	12.5
SODIUM HYDROXIDE (NA(OH))		1310-73-2	0.7
Other components below reportable levels			86.8

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Most important symptoms/effects, acute and delayed	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Foam. Powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Use water spray to reduce vapors or divert vapor cloud drift. Prevent entry into waterways, sewer, basements or confined areas. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Provide adequate ventilation. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store locked up. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)	PEL	2 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)	Ceiling	2 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)	Ceiling	2 mg/m3

US. Workplace Environmental Exposure Level (WEEL) Guides

Components	Type	Value
HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)	STEL	2 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

The following are recommendations for Personnel Protective Equipment (PPE). The employer/user of this product must perform a Hazard Assessment of the workplace according to OSHA regulations 29 CFR 1910.132 to determine the appropriate PPE for use while performing any task involving potential exposure to this product.

Eye/face protection Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Hand protection Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Other Wear appropriate chemical resistant clothing.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Liquid.

Form Liquid.

Color CLEAR PALE YELLOW

Odor CHLORINE

Odor threshold Not available.

pH 11.5 - 13.5

Melting point/freezing point -3 °F (-19.44 °C)

Initial boiling point and boiling range 230.55 °F (110.3 °C) estimated

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	10.00 lbs/gal
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Percent volatile	86.8 % estimated
Specific gravity	1.2

10. Stability and reactivity

Reactivity	Reacts violently with strong acids. This product may react with oxidizing agents.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials. Do not mix with other chemicals.
Incompatible materials	Acids. Oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Information on toxicological effects

Acute toxicity	Not available.
Skin corrosion/irritation	Causes severe skin burns and eye damage.
Serious eye damage/eye irritation	Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components		Species	Test Results
HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)			
Aquatic			
Fish	LC50	Chinook salmon (Oncorhynchus tshawytscha)	0.038 - 0.065 mg/l, 96 hours
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)			
Aquatic			
Crustacea	EC50	Water flea (Ceriodaphnia dubia)	34.59 - 47.13 mg/l, 48 hours
Fish	LC50	Western mosquitofish (Gambusia affinis)	125 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN1791

UN proper shipping name HYPOCHLORITE SOLUTIONS MARINE POLLUTANT (SODIUM HYPOCHLORITE) RQ

Transport hazard class(es)

Class 8

Subsidiary risk -
Packing group III
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
ERG number 154
DOT information on packaging may be different from that listed.

DOT

General information IMDG Regulated Marine Pollutant.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)	Listed.
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)	Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. Massachusetts RTK - Substance List

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. New Jersey Worker and Community Right-to-Know Act

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. Pennsylvania Worker and Community Right-to-Know Law

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. Rhode Island RTK

HYPOCHLOROUS ACID, SODIUM SALT (1:1) (CAS 7681-52-9)
SODIUM HYDROXIDE (NA(OH)) (CAS 1310-73-2)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	06-06-2015
Revision date	08-01-2016
Version #	36
HMIS® ratings	Health: 3 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 3 Flammability: 0 Instability: 0
Disclaimer	While Brenntag believes the information contained herein to be accurate, Brenntag makes no representation or warranty, express or implied, regarding, and assumes no liability for, the accuracy or completeness of the information. The Buyer assumes all responsibility for handling, using and/or reselling the Product in accordance with applicable federal, state, and local law. This SDS shall not in any way limit or preclude the operation and effect of any of the provisions of Brenntag's terms and conditions of sale.

SAFETY DATA SHEET
SULFURIC ACID

Rev. Date: 10/10/2013

1. IDENTIFICATION

Product Name (s)	**SULFURIC ACID**
Product Use	pH adjustment, water treatment and various industrial applications.
Supplier	Shrieve Chemical Company 1755 Woodstead Court, The Woodlands, TX 77380-USA
Contact Numbers	800-367-4226
E-mail Contact for SDS	Cust-Serv@shrieve.com (customer service)
Emergency Telephone Number	CHEMTREC: 800-424-9300

2. HAZARDS IDENTIFICATION

Human Health	Causes severe skin and eye burns.
Safety	Reacts violently with water. Contents under pressure may be explosive.
Environmental	

3. COMPOSITION / INFORMATION ON INGREDIENTS

Description Mixture

Component	Product Name	EINECS No.	CAS No.	Conc. (%)
Sulfuric Acid			7664-93-9	65-100
Water			7732-18-5	balance

4. FIRST AID MEASURES

Inhalation Remove victim from immediate source of exposure and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek medical attention.

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Skin	In case of contact, immediately wash with plenty of water for at least 15 minutes. Seek medical attention if irritation develops or persists. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use
Eye	Obtain immediate medical attention. Immediately flush eye with plenty of water for at least 20-60 minutes while holding eyelids open.
Ingestion	If victim is conscious and alert, give 2-3 glasses of water to drink and do not induce vomiting. Seek immediate medical attention. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. Vomiting may occur spontaneously. If vomiting occurs and the victim is conscious, give water to further dilute the chemical.

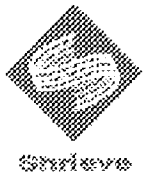
5. FIRE FIGHTING MEASURES

Extinguishing media Use extinguishing media suitable for surrounding fire

Unsuitable extinguishing media	None.
Fire fighting procedures	Firefighters should wear NIOSH/MSHA approved positive pressure breathing apparatus with full face-piece and full acid-resistant protective clothing. Fight fire from maximum distance. Reacts violently with water releasing heat and corrosive material.
Combustion products	Oxides of sulfur.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Personnel handling this material should be thoroughly trained to handle spills and releases. Do not direct hose streams into an unignited transportation spill (tank truck or tank car).
Personal Protection	Wear protective clothing specified for normal operations (see section 8).
Environmental Protection	Do not flush to drain. Runoff from fire control or dilution water may cause pollution.
Clean up methods - small spillage	Stop leak if it can be done without risk. Dike spill using absorbent or impervious materials such as earth, sand or clay. Dike or retain dilution water or water from firefighting for later disposal.
Clean up methods - large spillage	Stop leak if it can be done without risk. Dike spill using absorbent or impervious materials such as earth, sand or clay. Dike or retain dilution water or water from firefighting for later disposal. Pump any free liquid into an appropriate closed container. Exercise caution during neutralization as considerable heat may be generated. Carefully neutralize spill with soda ash. Absorb neutralized spill with an inert absorbent. Scrape up and place in appropriate closed container (see Section 7: Handling and Storage).



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7. HANDLING AND STORAGE

Handling

Do not breathe vapors and mists. Do not get on skin or in eyes. This product reacts violently with bases liberating heat and causing spattering.

When diluting an acid, ALWAYS add the acid slowly to water and stir well to avoid spattering. NEVER ADD WATER TO ACID.

Storage

Store in tightly closed containers. Store in an area that is dry, well-ventilated, diked with impermeable material.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupatonal exposure limits		TWA (8 hours)			STEL (15 min)			Ceiling			
Components:	List name	ppm	mg/m3	Other	ppm	mg/m3	Other	ppm	mg/m3	Other	Notes
Sulfuric Acid	US ACGIH	-	1	-	-	3	-	-	-	-	
	OSHA PEL	-	1	-	-	-	-	-	-	-	

Occupational Exposure Standards

Provide adequate ventilation. If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering Control Measures

Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: local exhaust ventilation at the point of generation.

Respiratory Protection

When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by the appropriate OSHA, WHMIS or ANSI standard(s): Air-purifying (half-mask/full-face) respirator with cartridges/canister approved for use against acid gases.

Hand Protection

Chemical resistant gloves: .

Eye Protection

Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.

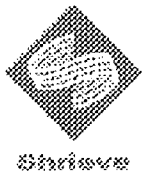
Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area.

Body Protection	Skin contact must be prevented through the use of permeation resistant clothing, gloves and footwear, selected with regard for use conditions and exposure potential. An emergency shower must be readily accessible to the work area. Consideration must be given both to durability as well as permeation resistance.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Physical state Colorless, oily liquid

Odor	none.
Odor Thresold	Not applicable
pH-value	1 at 1% by weight
Melting/Freezing Point	-36 to -28 C (-33 to -18 F)
Initial Boiling Point Range	151 to 276 C (304 to 529 F) at 760 mmHg
Flash Point	Not applicable
Evaporation Rate	Not available
Flammability	Not applicable
Upper/Lower Explosion Limits	Not available
Vapor Pressure	1to 0 mmHg at 40 C (104 F)
Vapor Density	3.4
Relative density	1.6-1.8 (25.°C)
Density	1.6 to 1.8 g/ml at 25 C (77 F).
Solubility	Dispersible in water
Partial coefficient (n-octanol/water)	Not available
Auto-ignition Temperature	Not available
Decomposition Temperature	Not available
Viscosity	Not available



10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions of use.
Conditions To Avoid	None known.
Incompatible Materials	Reacts violently with water. Avoid strong reducting agents, halogens, bases, metals and nitrogen compounds.
Thermal Decomposition Products	Oxides of sulfur

11. TOXICOLOGICAL INFORMATION

Basis for assessment	Information given is based on the toxicology literature
Skin irritation	No test data found. This product was not tested because strong acids are known to be corrosive and cause severe tissue destruction.
Eye irritation	250 ug/24 hr, rabbit. Severely irritating.
Acute toxicity - Dermal	ND
Acute toxicity - Inhalation	LC50 - lethal concentration 50% of test species, 510 mg/cu m/2 hr, rat. LC50 - lethal concentration 50% of test species, 347 ppm/1 hr, rat.
Acute toxicity - Oral	LD50 - lethal dose 50% of test species, 2140 mg/kg, rat.
Repeated dose toxicity	This product contains substances that are considered to be probably or suspected human carcinogens. The International Agency for Research on cancer (IARC) has classified strong inorganic acid mists containing sulfuric acid as a known human carcinogen (IARC Category 1). This classification applies only to sulfuric acid when it is generated as a mist. There is still debate in the scientific community whether the studies reviewed by IARC adequately controlled for confounding occupational exposures and personal habits such as cigarette smoking and alcohol consumption. A few epidemiology studies have suggested a possible association between sulfuric acid exposure and laryngeal or lung cancer; however, in all these studies, workers were exposed to many other chemicals, some of which are recognized carcinogens, such as diethylsulfate and nickel. Considering the multiple chemical exposures and other limitations of the studies, we disagree with IARC's conclusion that a cause and effect relationship between cancer and exposure to strong inorganic acid mist containing sulfuric acid has been demonstrated.
Mutagenicity	ND.
Developmental toxicity	ND.

12. ECOLOGICAL INFORMATION

Basis for Assessment	The toxicity of sulfuric acid to fish is dependent on the resulting pH of the water. lethality at a pH of 5.0 or below. required to cause lethality varies depending on the hardness of the water (hard water has some buffering capacity) and the species of fish (some fish are more resistant to the effects of acidity). McKee, JE, and Wolf, HA (Editors), Water Quality Criteria, 2nd ed., Publication No. 3-A, p. 279, California State Water Resources Control Board, Sacramento, CA (rev. 1963).
Mobility	ND
Persistence/degradability	ND
Bioaccumulation	ND
Freshwater Fish Toxicity	ND
Freshwater Invertebrates Toxicity	ND
Acute toxicity - algae	ND
Acute toxicity - bacteria	ND

13. DISPOSAL CONSIDERATIONS

Waste disposal	Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.
Container disposal	Drain container and rinse thoroughly. Puncture container to avoid reuse. Dispose to licensed disposal contractor.
Local Legislation	The recommendations given are considered appropriate for safe disposal. However, local regulations may be more stringent and these must be complied with.

14. TRANSPORT INFORMATION

DOT Classification	UN1830, 8, PGII SULFURIC ACID Reportable quantity: 1000 LBS

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15. REGULATORY INFORMATION

INTERNATIONAL REGISTRATION:

TSCA (USA)

All components listed or exempted.
SARA 302/304/311/312 extremely hazardous substances: Sulfuric Acid, 1000 lbs.
SARA 302/304 emergency planning and notification: Sulfuric Acid
SARA 302/304/311/312 hazardous chemicals: Sulfuric Acid
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: SULFURIC ACID: Immediate (acute) health hazard, Reactive Hazard.

CERCLA: Hazardous substances.: Sulfuric Acid, 1000 lbs.

16. OTHER INFORMATION

HEALTH HAZARD: 3

FIRE HAZARD: 0

REACTIVITY: 2