WATER QUALITY PERMIT

PAYMENT SUBMITTAL FORM

Use this form to submit the Application Fee, if the mailing the payment.

- Complete items 1 through 5 below.
- Staple the check or money order in the space provided at the bottom of this document.
- **Do not mail this form with the application form.**
- Do not mail this form to the same address as the application.
- Do not submit a copy of the application with this form as it could cause duplicate permit entries.

Mail this form and the check or money order to:

BY REGULAR U.S. MAIL	*BY OVERNIGHT/EXPRESS MAIL*
Texas Commission on Environmental Quality Financial Administration Division Cashier's Office, MC-214 P.O. Box 13088 Austin, Texas 78711-3088	Texas Commission on Environmental Quality Financial Administration Division Cashier's Office, MC-214 12100 Park 35 Circle Austin, Texas 78753

Fee Code: WQP **Waste Permit No:** WQ0010232001

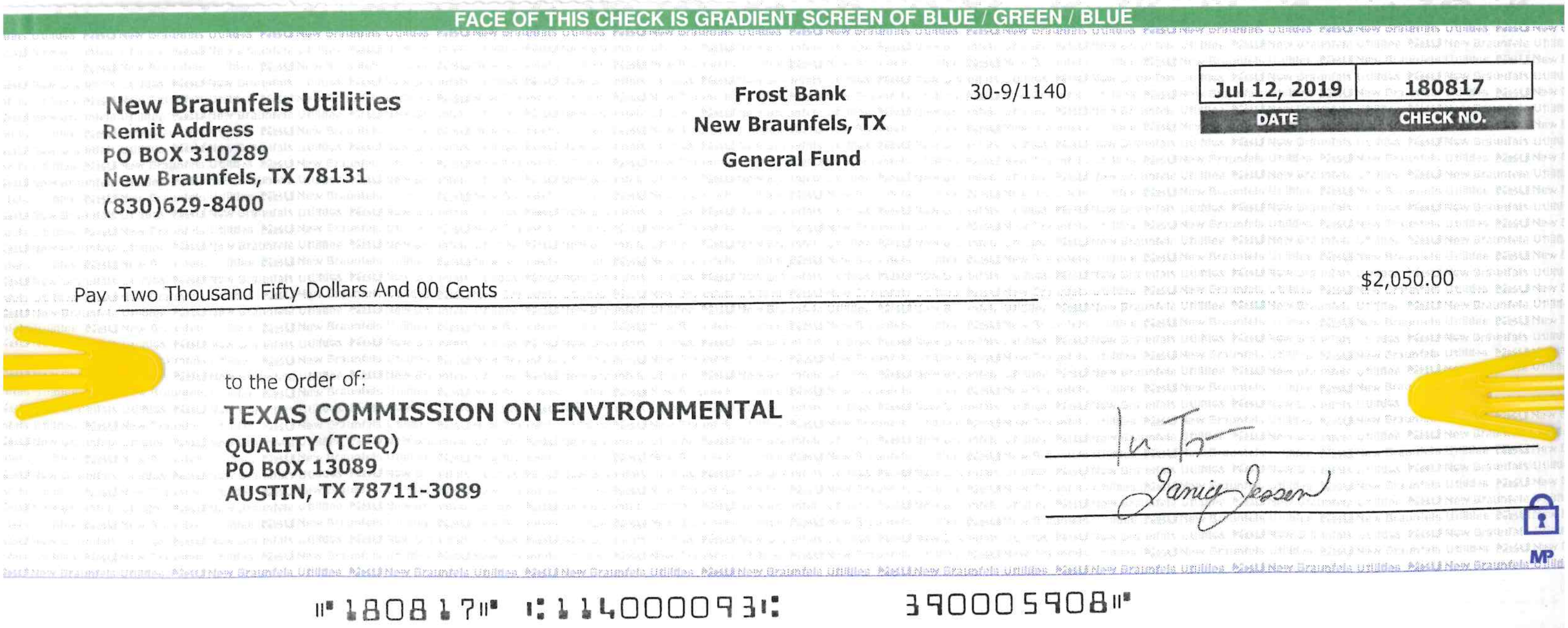
1. Check or Money Order Number: 180817
2. Check or Money Order Amount: $ 2,050.00
3. Date of Check or Money Order: 7.12.19
4. Name on Check or Money Order: TCEQ
5. APPLICATION INFORMATION

   Name of Project or Site: South Kuehler Wastewater Treatment Plant

   Physical Address of Project or Site: 1608 Coco Drive, New Braunfels, TX

   If the check is for more than one application, attach a list which includes the name of each Project or Site (RE) and Physical Address, exactly as provided on the application.

Staple Check or Money Order in This Space



FACE OF THIS CHECK IS GRADIENT SCREEN OF BLUE / GREEN / BLUE

New Braunfels Utilities
Remit Address
PO BOX 310289
New Braunfels, TX 78131
(830)629-8400

Frost Bank
New Braunfels, TX
General Fund

30-9/1140

DATE	CHECK NO.
Jul 12, 2019	180817

Pay Two Thousand Fifty Dollars And 00 Cents $2,050.00

to the Order of:
TEXAS COMMISSION ON ENVIRONMENTAL
QUALITY (TCEQ)
PO BOX 13089
AUSTIN, TX 78711-3089

Janice Jessen

⑈180817⑈ ⑆114000093⑆ 390005908⑈

.TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION CHECKLIST

Complete and submit this checklist with the application.

APPLICANT: New Braunfels Utilities

PERMIT NUMBER: WQ0010232001

Indicate if each of the following items is included in your application.

	Y	**N**
Administrative Report 1.0	☒	☐
Administrative Report 1.1	☒	☐
SPIF	☒	☐
Core Data Form	☒	☐
Technical Report 1.0	☒	☐
Technical Report 1.1	☒	☐
Worksheet 2.0	☒	☐
Worksheet 2.1	☐	☒
Worksheet 3.0	☐	☒
Worksheet 3.1	☐	☒
Worksheet 3.2	☐	☒
Worksheet 3.3	☐	☒
Worksheet 4.0	☒	☐
Worksheet 5.0	☐	☒
Worksheet 6.0	☒	☐
Worksheet 7.0	☐	☒

	Y	**N**
Original USGS Map	☒	☐
Affected Landowners Map	☒	☐
Landowner Disk or Labels	☒	☐
Buffer Zone Map	☒	☐
Flow Diagram	☒	☐
Site Drawing	☒	☐
Original Photographs	☒	☐
Design Calculations	☒	☐
Solids Management Plan	☒	☐
Water Balance	☐	☒

For TCEQ Use Only

Segment Number ____________________ County ____________________
Expiration Date ____________________ Region ____________________
Permit Number ____________________

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

APPLICATION FOR A DOMESTIC WASTEWATER PERMIT ADMINISTRATIVE REPORT 1.0

If you have questions about completing this form please contact the Applications Review and Processing Team at 512-239-4671.

Section 1. Application Fees (Instructions Page 29)

Indicate the amount submitted for the application fee (check only one).

Flow	**New/Major Amendment**	**Renewal**
<0.05 MGD	$350.00 ☐	$315.00 ☐
≥0.05 but <0.10 MGD	$550.00 ☐	$515.00 ☐
≥0.10 but <0.25 MGD	$850.00 ☐	$815.00 ☐
≥0.25 but <0.50 MGD	$1,250.00 ☐	$1,215.00 ☐
≥0.50 but <1.0 MGD	$1,650.00 ☐	$1,615.00 ☐
≥1.0 MGD	$2,050.00 ☒	$2,015.00 ☐

Minor Amendment (for any flow) $150.00 ☐

Payment Information:

Mailed Check/Money Order Number: 180817

Check/Money Order Amount: $ 2,050.00

Name Printed on Check: TCEQ

EPAY Voucher Number: Click here to enter text.

Copy of Payment Voucher enclosed? Yes ☐

Section 2. Type of Application (Instructions Page 29)

☐ New TPDES	☐ New TLAP
☒ Major Amendment *with* Renewal	☐ Minor Amendment *with* Renewal
☐ Major Amendment *without* Renewal	☐ Minor Amendment *without* Renewal
☐ Renewal without changes	☐ Minor Modification of permit

For amendments or modifications, describe the proposed changes: Include plant phases of 9.5 MGD and 15.4 MGD into the permit, relocate the outfall, change disinfection method from chlorine gas to UV, and allow for two outfalls and two types of disinfection during construction.

For existing permits:

Permit Number: WQ0010232001

EPA I.D. (TPDES only): TX0067881

Expiration Date: 2/1/2020

Section 3. Facility Owner (Applicant) and Co-Applicant Information (Instructions Page 29)

A. The owner of the facility must apply for the permit.

What is the Legal Name of the entity (applicant) applying for this permit?

New Braunfels Utilities

(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at http://www15.tceq.texas.gov/crpub/

CN: 600522957

What is 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*.

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Ryan Kelso

Credential (P.E, P.G., Ph.D., etc.):

Title: COO, New Braunfels Utilities

B. Co-applicant information. Complete this section only if another person or entity is required to apply as a co-permittee.

What is the Legal Name of the co-applicant applying for this permit?

N/A

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

If the co-applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at: http://www15.tceq.texas.gov/crpub/

CN: Click here to enter text.

What is 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*.

Prefix (Mr., Ms., Miss): Click here to enter text.

First and Last Name: Click here to enter text.

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: Click here to enter text.

Provide a brief description of the need for a co-permittee: Click here 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 Administrative Report 1.0.

Attachment: See Attachment A

Section 4. Application Contact Information (Instructions Page 30)

This is the person(s) TCEQ will contact if additional information is needed about this application. Provide a contact for administrative questions and technical questions.

A. Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Steve Barry

Credential (P.E, P.G., Ph.D., etc.): P.E.

Title: Project Engineer

Organization Name: Jones & Carter, Inc.

Mailing Address: 1535 Sawdust Road, Suite 400

City, State, Zip Code: The Woodlands, TX 77380

Phone No.: 281-363-4039 Ext.: Click here to enter text. Fax No.: Click here to enter text.

E-mail Address: sbarry@jonescarter.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

B. Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Brent Lundmark

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: Water Treatment & Compliance Manager

Organization Name: New Braunfels Utilities

Mailing Address: P.O. Box 310289

City, State, Zip Code: New Braunfels, TX 78130

Phone No.: 830-608-8900 Ext.: Click here to enter text. Fax No.: Click here to enter text.

E-mail Address: blundmark@nbutexas.com

Check one or both: ☒ Administrative Contact ☐ Technical Contact

Section 5. Permit Contact Information (Instructions Page 30)

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

A. Prefix (Mr., Ms., Miss): Mr.
First and Last Name: John Harrell
Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.
Title: President
Organization Name: New Braunfels Utilities
Mailing Address: 263 Main Plaza
City, State, Zip Code: New Braunfels, TX 78130
Phone No.: 830-608-8900 Ext.: Click here to enter text. Fax No.: Click here to enter text.
E-mail Address: jharrell@nbutexas.com

B. Prefix (Mr., Ms., Miss): Mr..
First and Last Name: Ryan Kelso
Credential (P.E, P.G., Ph.D., etc.):
Title: COO
Organization Name: New Braunfels Utilities
Mailing Address: 263 Main Plaza
City, State, Zip Code: New Braunfels, TX 78130
Phone No.: 830-608-8900 Ext.: Click here to enter text. Fax No.: Click here to enter text.
E-mail Address: rkelso@nbutexas.com

Section 6. Billing Information (Instructions Page 30)

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 (using form TCEQ-20029).

Prefix (Mr., Ms., Miss): Mr.
First and Last Name: Brent Lundmark
Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.
Title: Water Treatment & Compliance Manager
Organization Name: New Braunfels Utilities
Mailing Address: P.O. Box 310289
City, State, Zip Code: New Braunfels, TX 78130
Phone No.: 830-608-8900 Ext.: Click here to enter text. Fax No.: Click here to enter text.
E-mail Address: blundmark@nbutexas.com

Section 7. DMR/MER Contact Information (Instructions Page 31)

Provide the name and complete mailing address of the person delegated to receive and submit

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Brent Lundmark

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: Water Treatment & Compliance Manager

Organization Name: New Braunfels Utilities

Mailing Address: P.O. Box 310289

City, State, Zip Code: New Braunfels, TX 78130

Phone No.: 830-608-8900 Ext.: Click here to enter text. Fax No.: Click here to enter text.

E-mail Address: blundmark@nbutexas.com

DMR data is required to be submitted electronically. Create an account at: https://www.tceq.texas.gov/permitting/netdmr/netdmr.html.

Section 8. Public Notice Information (Instructions Page 31)

A. Individual Publishing the Notices

Prefix (Mr., Ms., Miss): Ms.

First and Last Name: Pam Quidley

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: Communications & Marketing Manager

Organization Name: New Braunfels Utilities

Mailing Address: 263 Main Plaza

City, State, Zip Code: New Braunfgels, TX 78130

Phone No.: 830-312-7940 Ext.: Click here to enter text. Fax No.: Click here to enter text.

E-mail Address: pquidley@nbutexas.com

B. Method for Receiving Notice of Receipt and Intent to Obtain a Water Quality Permit Package

Indicate by a check mark the preferred method for receiving the first notice and instructions:

☒ E-mail Address

☐ Fax

☐ Regular Mail

C. Contact person to be listed in the Notices

Prefix (Mr., Ms., Miss): Mr

First and Last Name: Brent Lundmark

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: Water Treatment & Compliance Manager

Organization Name: New Braunfels Utilities

Phone No.: 830-608-8900 Ext.: Click here to enter text.

E-mail: blundmark@nbutexas.com

D. Public Viewing Information

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

Public building name: New Braunfels Utilities

Location within the building: Front Desk

Physical Address of Building: 263 Main Plaza

City: New Braunfels, TX 78130 County: Comal

Contact Name: Pam Quidley

Phone No.: 830-312-7940 Ext.: Click here to enter text.

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.

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** Section 9 below.

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

Section 9. Regulated Entity and Permitted Site Information (Instructions Page 33)

A. If the site is currently regulated by TCEQ, provide the Regulated Entity Number (RN) issued to this site. **RN**102078011

Search the TCEQ's Central Registry at http://www15.tceq.texas.gov/crpub/ to determine if the site is currently regulated by TCEQ.

B. Name of project or site (the name known by the community where located):

South Kuehler Wastewater Treatment Plant

C. Owner of treatment facility: New Braunfels Utilities

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

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

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Ryan Kelso

Mailing Address: 263 Main Plaza

City, State, Zip Code: New Braunfels, TX 78130

Phone No.: 830-608-8900 E-mail Address: rkelso@nbutexas.com

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment: Click here to enter text.

E. Owner of effluent disposal site:

Prefix (Mr., Ms., Miss): N/A

First and Last Name: Click here to enter text.

Mailing Address: Click here to enter text.

City, State, Zip Code: Click here to enter text.

Phone No.: Click here to enter text. E-mail Address: Click here to enter text.

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment: Click here to enter text.

F. Owner of sewage sludge disposal site (if authorization is requested for sludge disposal on property owned or controlled by the applicant):

Prefix (Mr., Ms., Miss): N/A

First and Last Name: Click here to enter text.

Mailing Address: Click here to enter text.

City, State, Zip Code: Click here to enter text.

Phone No.: Click here to enter text. E-mail Address: Click here to enter text.

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment: Click here to enter text.

Section 10. TPDES Discharge Information (Instructions Page 34)

A. Is the wastewater treatment facility location in the existing permit accurate?

☒ Yes ☐ No

If **no, or a new permit application**, please give an accurate description:

Click here to enter text.

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

☒ Yes ☐ No

If **no**, **or a new or amendment permit application**, provide an accurate description of the point of discharge and the discharge route to the nearest classified segment as defined in 30 TAC Chapter 307:

The description in the permit is accurate, but the outfall will be moved about 500 feet upstream.

City nearest the outfall(s): New Braunfels

County in which the outfalls(s) is/are located: Comal

Outfall Latitude: 29.686403 deg N Longitude: 98.099436 deg W

C. 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: Click here to enter text.

D. 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.

Comal County, Guadalupe County, Gonzales County, Dewitt County

Section 11. TLAP Disposal Information (Instructions Page 36)

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

☐ Yes ☒ No

If **no, or a new or amendment permit application**, provide an accurate description of the disposal site location:

Click here to enter text.

B. City nearest the disposal site: Click here to enter text.

C. County in which the disposal site is located: Click here to enter text.

D. Disposal Site Latitude: Click here to enter text. Longitude: Click here to enter text.

E. For **TLAPs**, describe the routing of effluent from the treatment facility to the disposal site:

Click here to enter text.

F. For **TLAPs**, please identify the nearest watercourse to the disposal site to which rainfall runoff might flow if not contained:

Click here to enter text.

Section 12. Miscellaneous Information (Instructions Page 37)

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

☐ Yes ☒ No N/A - Not a TLAP Application

B. If the existing permit contains an onsite sludge disposal authorization, is the location of the sewage sludge disposal site in the existing permit accurate?

☐ Yes ☐ No ☒ Not Applicable

If No, or if a new onsite sludge disposal authorization is being requested in this permit application, provide an accurate location description of the sewage sludge disposal site.

Click here to enter text.

C. 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 formerly employed by the TCEQ who represented your company and was paid for service regarding the application:

Click here to enter text.

D. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

If **yes**, provide the following information:

Account number: Click here to enter text. Amount past due: Click here to enter text.

E. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

If **yes**, please provide the following information:

Enforcement order number: Click here to enter text. Amount past due: Click here to enter text.

Section 13. Attachments (Instructions Page 38)

Indicate which attachments are included with the Administrative Report. Check all that apply:

☐ Lease agreement or deed recorded easement, if the land where the treatment facility is located or the effluent disposal site are not owned by the applicant or co-applicant.

☒ Original full-size USGS Topographic Map with the following information:

- Applicant's property boundary
- Treatment facility boundary
- Labeled point of discharge for each discharge point (TPDES only)
- Highlighted discharge route for each discharge point (TPDES only)
- Onsite sewage sludge disposal site (if applicable)
- Effluent disposal site boundaries (TLAP only)
- New and future construction (if applicable)
- 1 mile radius information

- 3 miles downstream information (TPDES only)
- All ponds.

☐ Attachment 1 for Individuals as co-applicants

☒ Other Attachments. Please specify: See Table of Attachments

Section 14. Signature Page (Instructions Page 39)

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

Permit Number: WQ0010232001

Applicant: New Braunfels Utilities

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): Ryan Kelso

Signatory title: COO, New Braunfels Utilities

Signature:______________________ Date: 7/25/19

(Use blue ink)

Subscribed and Sworn to before me by the said Ryan Kelso

on this 25th day of July, 2019.

My commission expires on the 15th day of November, 2022.

ROCIO V. GALLEGOS
Notary Public, State of Texas
Comm. Expires 11-15-2022
Notary ID 131797652

[SEAL]

Notary Public

Comal

County, Texas

DOMESTIC ADMINISTRATIVE REPORT 1.1

The following information is required for new and amendment applications.

Section 1. Affected Landowner Information (Instructions Page 41)

A. Indicate by a check mark that the landowners map or drawing, with scale, includes the following information, as applicable:

☒ 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 (for example, irrigation area or subsurface drainfield site) and all evaporation/holding ponds within the applicant’s property

☐ The property boundaries of all landowners surrounding the effluent disposal site

☐ The boundaries of the sludge land application site (for land application of sewage sludge for beneficial use) and the property boundaries of landowners surrounding 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 (for example, sludge surface disposal site or sludge monofill) is located

B. ☒ Indicate by a check mark that a separate list with the landowners’ names and mailing addresses cross-referenced to the landowner’s map has been provided.

C. Indicate by a check mark in which format the landowners list is submitted:

☒ Readable/Writeable CD ☐ Four sets of labels

D. Provide the source of the landowners’ names and mailing addresses: Comal 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):

Click here to enter text.

Section 2. Original Photographs (Instructions Page 44)

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

Section 3. Buffer Zone Map (Instructions Page 44)

A. Buffer zone map. Provide a buffer zone map on 8.5 x 11-inch paper with all of the following information. The applicant's property line and the buffer zone line may be distinguished by using dashes or symbols and appropriate labels.

- The applicant's property boundary;
- The required buffer zone; and
- Each treatment unit; and
- The distance from each treatment unit to the property boundaries.

B. Buffer zone compliance method. Indicate how the buffer zone requirements will be met. Check all that apply.

☒ Ownership

☐ Restrictive easement

☒ Nuisance odor control

☐ Variance

C. Unsuitable site characteristics. Does the facility comply with the requirements regarding unsuitable site characteristic found in 30 TAC § 309.13(a) through (d)?

☒ Yes ☐ No

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING DOMESTIC 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 53)

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: New Braunfels Utilities

   Permit No. WQ00 10232001 EPA ID No. TX 0067881

   Address of the project (or a location description that includes street/highway, city/vicinity, and county):

   1608 Coco Drive, Comal County, New Braunfels, TX

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

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Brent Lundmark

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: Water Treatment & Compliance Manager

Mailing Address: P.O. Box 310289

City, State, Zip Code: New Braunfels, TX 78130

Phone No.: 830-608-8900 Ext.: Click here to enter text. Fax No.: Click here to enter text.

E-mail Address: blundmark@nbutexas.com

2. List the county in which the facility is located: Comal
3. If the property is publicly owned and the owner is different than the permittee/applicant, please list the owner of the property.

The property owner is the permittee

4. 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.

Discharge is to an unnamed tributary of the Guadalupe River; thence to the Guadalupe River Below Comal River in Segment No. 1804 of the Guadalupe River Basin

5. 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).

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

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

6. List proposed construction impact (surface acres to be impacted, depth of excavation, sealing of caves, or other karst features):

About 10 acres of land will be disturbed during construction. No caves or karst features will be sealed.

7. Describe existing disturbances, vegetation, and land use:

The land is used as a wastewater treatment plant site. Some trees will be cleared during construction.

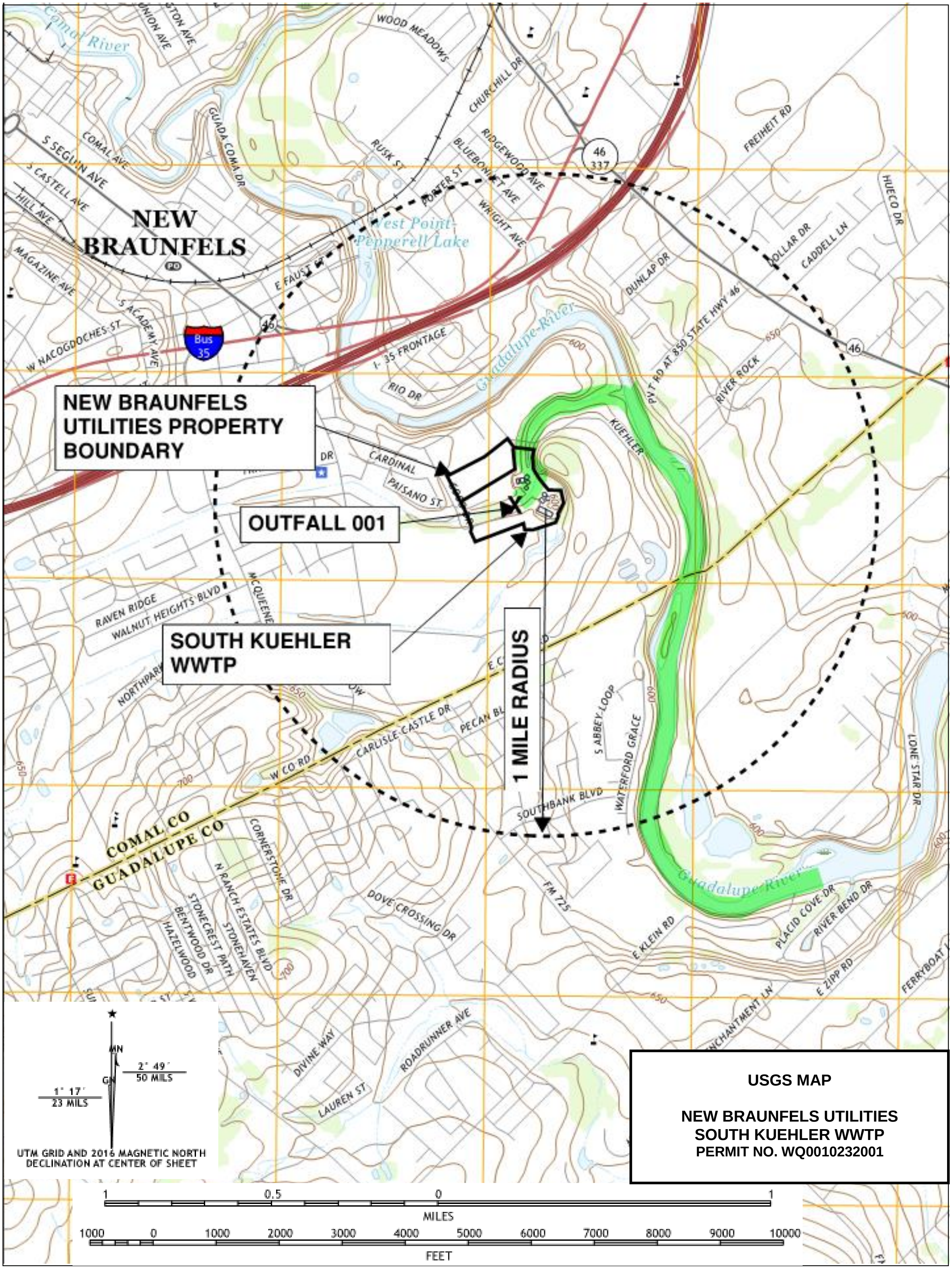
THE FOLLOWING ITEMS APPLY ONLY TO APPLICATIONS FOR NEW TPDES PERMITS AND MAJOR AMENDMENTS TO TPDES PERMITS

8. List construction dates of all buildings and structures on the property:

The last expansion project for the South Kuehler Plant occurred in 1991.

9. Provide a brief history of the property, and name of the architect/builder, if known.

The property was woodlands owned by the City of New Braunfels



USGS MAP

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WWTP
PERMIT NO. WQ0010232001

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION

DOMESTIC TECHNICAL REPORT 1.0

The Following Is Required For All Applications

Renewal, New, And Amendment

Section 1. Permitted or Proposed Flows (Instructions Page 51)

A. Existing/Interim I Phase

Design Flow (MGD): 4.2

2-Hr Peak Flow (MGD): 12.6

Estimated construction start date: ---------

Estimated waste disposal start date: ---------

B. Interim II Phase

Design Flow (MGD): 9.3

2-Hr Peak Flow (MGD): 27.9

Estimated construction start date: August 2020

Estimated waste disposal start date: July 2023

C. Final Phase

Design Flow (MGD): 15.4

2-Hr Peak Flow (MGD): 46.2

Estimated construction start date: January 2026

Estimated waste disposal start date: December 2029

D. Current operating phase: 4.2 MGD

Provide the startup date of the facility: 1991

Section 2. Treatment Process (Instructions Page 51)

A. Treatment process description

Provide a detailed description of the treatment process. **Include the type of**

treatment plant, mode of operation, and all treatment units. Start with the plant's head works and finish with the point of discharge. Include all sludge processing and drying units. **If more than one phase exists or is proposed in the permit, a description of *each phase* must be provided**. Process description:

See Attachment H

Port or pipe diameter at the discharge point, in inches: 36

B. Treatment Units

In Table 1.0(1), provide the treatment unit type, the number of units, and dimensions (length, width, depth) **of each treatment unit, accounting for *all* phases of operation**.

Table 1.0(1) – Treatment Units

Treatment Unit Type	Number of Units	Dimensions (L x W x D)
See Attachment H		

C. Process flow diagrams

Provide flow diagrams for the existing facilities and **each** proposed phase of construction.

Attachment: See Attachment I

Section 3. Site Drawing (Instructions Page 52)

Provide a site drawing for the facility that shows the following:

- The boundaries of the treatment facility;
- The boundaries of the area served by the treatment facility;
- If land disposal of effluent, the boundaries of the disposal site and all storage/holding ponds; and
- If sludge disposal is authorized in the permit, the boundaries of the land application or disposal site.

Attachment: See Attachment J

Provide the name and a description of the area served by the treatment facility.

The wastewater treatment plant serves central and south New Braunfels

Section 4. Unbuilt Phases (Instructions Page 52)

Is the application for a renewal of a permit that contains an unbuilt phase or phases?

Yes ☐ No ☒

If yes, does the existing permit contain a phase that has not been constructed within five years of being authorized by the TCEQ?

Yes ☐ No ☐

If yes, provide a detailed discussion regarding the continued need for the unbuilt phase. Failure to provide sufficient justification may result in the Executive Director recommending denial of the unbuilt phase or phases.

Click here to enter text.

Section 5. Closure Plans (Instructions Page 53)

Have any treatment units been taken out of service permanently, or will any units be taken out of service in the next five years?

Yes ☐ No ☒

If yes, was a closure plan submitted to the TCEQ?

Yes ☐ No ☐

If yes, provide a brief description of the closure and the date of plan approval.

Click here to enter text.

Section 6. Permit Specific Requirements (Instructions Page 53)

For applicants with an existing permit, check the *Other Requirements* or *Special Provisions* of the permit.

A. Summary transmittal

Have plans and specifications been approved for the existing facilities and each proposed phase?

Yes ☒ No ☐

If yes, provide the date(s) of approval for each phase: Unknown

Provide information, including dates, on any actions taken to meet a requirement or provision pertaining to the submission of a summary transmittal letter. Provide a copy of an approval letter from the TCEQ, if applicable.

No action required

B. Buffer zones

Have the buffer zone requirements been met?

Yes ☒ No ☐

Provide information below, including dates, on any actions taken to meet the conditions of the buffer zone. If available, provide any new documentation relevant to maintaining the buffer zones.

No action required

C. Other actions required by the current permit

Does the *Other Requirements* or *Special Provisions* section in the existing permit require submission of any other information or other required actions? Examples include Notification of Completion, progress reports, soil monitoring data, etc.

Yes ☐ No ☒

If yes, provide information below on the status of any actions taken to meet the conditions of an *Other Requirement* or *Special Provision.*

Click here to enter text.

D. Grit and grease treatment

1. Acceptance of grit and grease waste

Does the facility have a grit and/or grease processing facility onsite that treats and decants or accepts transported loads of grit and grease waste that are discharged directly to the wastewater treatment plant prior to any treatment?

Yes ☐ No ☒

If No, stop here and continue with Subsection E. Stormwater Management.

2. Grit and grease processing

Describe below how the grit and grease waste is treated at the facility. In your description, include how and where the grit and grease is introduced to the treatment works and how it is separated or processed. Provide a flow diagram showing how grit and grease is processed at the facility.

Click here to enter text.

3. Grit disposal

Does the facility have a Municipal Solid Waste (MSW) registration or permit for grit disposal?

Yes ☐ No ☐

If No, contact the TCEQ Municipal Solid Waste team at 512-239-0000. Note: A registration or permit is required for grit disposal. Grit shall not be combined with treatment plant sludge. See the instruction booklet for additional information on grit disposal requirements and restrictions.

Describe the method of grit disposal.

Click here to enter text.

4. Grease and decanted liquid disposal

Note: A registration or permit is required for grease disposal. Grease shall not be combined with treatment plant sludge. For more information, contact the TCEQ Municipal Solid Waste team at 512-239-0000.

Describe how the decant and grease are treated and disposed of after grit separation.

Click here to enter text.

E. Stormwater management

1. Applicability

Does the facility have a design flow of 1.0 MGD or greater in any phase?

Yes ☒ No ☐

Does the facility have an approved pretreatment program, under 40 CFR Part 403?

Yes ☒ No ☐

If no to both of the above, then skip to Subsection F, Other Wastes Received.

2. MSGP coverage

Is the stormwater runoff from the WWTP and dedicated lands for sewage disposal currently permitted under the TPDES Multi-Sector General Permit (MSGP), TXR050000?

Yes ☒ No ☐

If yes, please provide MSGP Authorization Number and skip to Subsection F, Other Wastes Received:

TXR05 R076 or TXRNE Click here to enter text.

If no, do you intend to seek coverage under TXR050000?

Yes ☐ No ☐

3. Conditional exclusion

Alternatively, do you intend to apply for a conditional exclusion from permitting based TXR050000 (Multi Sector General Permit) Part II B.2 or TXR050000 (Multi Sector General Permit) Part V, Sector T 3(b)?

Yes ☐ No ☐

If yes, please explain below then proceed to Subsection F, Other Wastes Received:

Click here to enter text.

4. Existing coverage in individual permit

Is your stormwater discharge currently permitted through this individual TPDES or TLAP permit?

Yes ☐ No ☐

If yes, provide a description of stormwater runoff management practices at the site that are authorized in the wastewater permit then skip to Subsection F, Other Wastes Received.

Click here to enter text.

5. Zero stormwater discharge

Do you intend to have no discharge of stormwater via use of evaporation or other means?

Yes ☐ No ☐

If yes, explain below then skip to Subsection F. Other Wastes Received.

Click here to enter text.

Note: If there is a potential to discharge any stormwater to surface water in the state as the result of any storm event, then permit coverage is required under the MSGP or an individual discharge permit. This requirement applies to all areas of facilities with treatment plants or systems that treat, store, recycle, or reclaim domestic sewage, wastewater or sewage sludge (including dedicated lands for sewage sludge disposal located within the onsite property boundaries) that meet the applicability criteria of above. You have the option of obtaining coverage under the MSGP for direct discharges, (recommended), or obtaining coverage under this individual permit.

6. Request for coverage in individual permit

Are you requesting coverage of stormwater discharges associated with your treatment plant under this individual permit?

Yes ☐ No ☐

If yes, provide a description of stormwater runoff management practices at the site for which you are requesting authorization in this individual wastewater permit and describe whether you intend to comingle this discharge with your treated effluent or discharge it via a separate dedicated stormwater outfall. Please also indicate if you intend to divert stormwater to the treatment plant headworks and indirectly discharge it to water in the state.

Click here to enter text.

Note: Direct stormwater discharges to waters in the state authorized through this individual permit will require the development and implementation of a stormwater pollution prevention plan (SWPPP) and will be subject to additional monitoring and reporting requirements. Indirect discharges of stormwater via headworks recycling will require compliance with all individual permit requirements including 2-hour peak flow limitations. All stormwater discharge authorization requests will require additional information during the technical review of your application.

F. Discharges to the Lake Houston Watershed

Does the facility discharge in the Lake Houston watershed?
Yes ☐ No ☒

If yes, a Sewage Sludge Solids Management Plan is required. See Example 5 in the instructions.

G. Other wastes received including sludge from other WWTPs and septic waste

1. Acceptance of sludge from other WWTPs

Does the facility accept or will it accept sludge from other treatment plants at the facility site?
Yes ☐ No ☒

If yes, attach sewage sludge solids management plan. See Example 5 of the instructions.

In addition, provide the date that the plant started accepting sludge or is anticipated to start accepting sludge, an estimate of monthly sludge acceptance (gallons or millions of gallons), an estimate of the BOD_5 concentration of the sludge, and the design BOD_5 concentration of the influent from the collection system. Also note if this information has or has not changed since the last permit action.

Click here to enter text.

Note: Permits that accept sludge from other wastewater treatment plants may be required to have influent flow and organic loading monitoring.

2. *Acceptance of septic waste*

Is the facility accepting or will it accept septic waste?

Yes ☐ No ☒

If yes, does the facility have a Type V processing unit?

Yes ☐ No ☒

If yes, does the unit have a Municipal Solid Waste permit?

Yes ☐ No ☒

If yes to any of the above, provide a the date that the plant started accepting septic waste, or is anticipated to start accepting septic waste, an estimate of monthly septic waste acceptance (gallons or millions of gallons), an estimate of the BOD_5 concentration of the septic waste, and the design BOD_5 concentration of the influent from the collection system. Also note if this information has or has not changed since the last permit action.

Click here to enter text.

Note: Permits that accept sludge from other wastewater treatment plants may be required to have influent flow and organic loading monitoring.

3. *Acceptance of other wastes (not including septic, grease, grit, or RCRA, CERCLA or as discharged by IUs listed in Worksheet 6)*

Is the facility accepting or will it accept wastes that are not domestic in nature excluding the categories listed above?

Yes ☐ No ☒

If yes, provide the date that the plant started accepting the waste, an estimate how much waste is accepted on a monthly basis (gallons or millions of gallons), a description of the entities generating the waste, and any distinguishing chemical or other physical characteristic of the waste. Also note if this information has or has not changed since the last permit action.

Click here to enter text.

Section 7. Pollutant Analysis of Treated Effluent (Instructions Page 58)

Is the facility in operation?

Yes ☒ No ☐

If no, this section is not applicable. Proceed to Section 8.

If yes, provide effluent analysis data for the listed pollutants. ***Wastewater treatment facilities*** complete Table 1.0(2). W***ater treatment facilities*** discharging filter backwash water, complete Table 1.0(3).

Note: The sample date must be within 1 year of application submission.

Table 1.0(2) - Pollutant Analysis for Wastewater Treatment Facilities

Pollutant	**Average Conc.**	**Max Conc.**	**No. of Samples**	**Sample Type**	**Sample Date/Time**
$CBOD_5$, mg/l	4.97	5.00	1	Comp	4-16-19 / 0800
Total Suspended Solids, mg/l	4.15	4.18	2	comp	4-16-19 / 0800
Ammonia Nitrogen, mg/l	0.318	0.318	1	comp	4-16-19 / 0800
Nitrate Nitrogen, mg/l	28.8	28.8	1	comp	4-2-19 / 0800
Total Kjeldahl Nitrogen, mg/l	3.0	3.0	1	comp	4-2-19 / 0800
Sulfate, mg/l	100.0	100.0	1	Comp	4-2-19 / 0800
Chloride, mg/l	172.0	172.0	1	comp	4-2-19 / 0800
Total Phosphorus, mg/l	2.55	2.55	1	comp	4-12-19 / 0800
pH, standard units	7.42	7.42	1	Grab	4-11-19 / 1346
Dissolved Oxygen*, mg/l	8.23	8.23	1	Grab	5-28-19 / 0857
Chlorine Residual, mg/l	1.9	1.9	1	Grab	4-11-19 / 1346
E.coli (CFU/100ml) freshwater	<1	<1	1	Grab	4-11-19 / 1346
Entercocci (CFU/100ml)	N/A	N/A	N/A	N/A	N/A

Pollutant	**Average Conc.**	**Max Conc.**	**No. of Samples**	**Sample Type**	**Sample Date/Time**
saltwater					
Total Dissolved Solids, mg/l	518	518	1	Grab	4-11-19 / 1346
Electrical Conductivity, µmohs/cm, †	1072	1072	1	Grab	4-11-19 / 1346
Oil & Grease, mg/l	< 5	< 5	1	Grab	4-15-19 / 1006
Alkalinity ($CaCO_3$)*, mg/l	132.0	132.0	1	comp	4-2-19 / 0800

*TPDES permits only

†TLAP permits only

Table 1.0(3) - Pollutant Analysis for Water Treatment Facilities

Pollutant	**Average Conc.**	**Max Conc.**	**No. of Samples**	**Sample Type**	**Sample Date/Time**
Total Suspended Solids, mg/l	N/A	N/A	N/A	N/A	N/A
Total Dissolved Solids, mg/l	N/A	N/A	N/A	N/A	N/A
pH, standard units	N/A	N/A	N/A	N/A	N/A
Fluoride, mg/l	N/A	N/A	N/A	N/A	N/A
Aluminum, mg/l	N/A	N/A	N/A	N/A	N/A
Alkalinity ($CaCO_3$), mg/l	N/A	N/A	N/A	N/A	N/A

Section 8. Facility Operator (Instructions Page 60)

Facility Operator Name: Orlando Pena

Facility Operator's License Classification and Level: Class A

Facility Operator's License Number: WW0004005

Section 9. Sewage Sludge Management and Disposal (Instructions Page 60)

A. Sludge disposal method

Identify the current or anticipated sludge disposal method or methods from the following list. Check all that apply.

☒ Permitted landfill

☐ Permitted or Registered land application site for beneficial use

☐ Land application for beneficial use authorized in the wastewater permit

☐ Permitted sludge processing facility

☐ Marketing and distribution as authorized in the wastewater permit

☐ Composting as authorized in the wastewater permit

☐ Permitted surface disposal site (sludge monofill)

☐ Surface disposal site (sludge monofill) authorized in the wastewater permit

☐ Transported to another permitted wastewater treatment plant or permitted sludge processing facility. If you selected this method, a written statement or contractual agreement from the wastewater treatment plant or permitted sludge processing facility accepting the sludge must be included with this application.

☐ Other: Click here to enter text.

B. Sludge disposal site

Disposal site name: Mesquite Creek Landfill

TCEQ permit or registration number: MSW-66B

County where disposal site is located: Comal

C. Sludge transportation method

Method of transportation (truck, train, pipe, other): Truck

Name of the hauler: Residuals Transport

Hauler registration number: 24346

Sludge is transported as a:

Liquid ☐ semi-liquid ☐ semi-solid ☒ solid ☐

Section 10. Permit Authorization for Sewage Sludge Disposal (Instructions Page 60)

A. Beneficial use authorization

Does the existing permit include authorization for land application of sewage sludge for beneficial use?

Yes ☐ No ☒

If yes, are you requesting to continue this authorization to land apply sewage sludge for beneficial use?

Yes ☐ No ☐

If yes, is the completed **Application for Permit for Beneficial Land Use of Sewage Sludge (TCEQ Form No. 10451)** attached to this permit application (see the instructions for details)?

Yes ☐ No ☐

B. Sludge processing authorization

Does the existing permit include authorization for any of the following sludge processing, storage or disposal options?

Sludge Composting	Yes ☐	No ☒
Marketing and Distribution of sludge	Yes ☐	No ☒
Sludge Surface Disposal or Sludge Monofill	Yes ☐	No ☒
Temporary storage in sludge lagoons	Yes ☐	No ☒

If yes to any of the above sludge options and the applicant is requesting to continue this authorization, is the completed **Domestic Wastewater Permit Application: Sewage Sludge Technical Report (TCEQ Form No. 10056)** attached to this permit application?

Yes ☐ No ☐

Section 11. Sewage Sludge Lagoons (Instructions Page 61)

Does this facility include sewage sludge lagoons?

Yes ☐ No ☒

If yes, complete the remainder of this section. If no, proceed to Section 12.

A. Location information

The following maps are required to be submitted as part of the application. For each map, provide the Attachment Number.

- Original General Highway (County) Map:

  Attachment: Click here to enter text.
- USDA Natural Resources Conservation Service Soil Map:

  Attachment: Click here to enter text.
- Federal Emergency Management Map:

  Attachment: Click here to enter text.
- Site map:

  Attachment: Click here to enter text.

Discuss in a description if any of the following exist within the lagoon area.

Check all that apply.

☐ Overlap a designated 100-year frequency flood plain

☐ Soils with flooding classification

☐ Overlap an unstable area

☐ Wetlands

☐ Located less than 60 meters from a fault

☐ None of the above

Attachment: Click here to enter text.

If a portion of the lagoon(s) is located within the 100-year frequency flood plain, provide the protective measures to be utilized including type and size of protective structures:

Click here to enter text.

B. Temporary storage information

Provide the results for the pollutant screening of sludge lagoons. These results are in addition to pollutant results in Section 7 of Technical Report 1.0.

Nitrate Nitrogen, mg/kg: Click here to enter text.

Total Kjeldahl Nitrogen, mg/kg: Click here to enter text.

Total Nitrogen (=nitrate nitrogen + TKN), mg/kg: Click here to enter text.

Phosphorus, mg/kg: Click here to enter text.

Potassium, mg/kg: Click here to enter text.

pH, standard units: Click here to enter text.

Ammonia Nitrogen mg/kg: Click here to enter text.

Arsenic: Click here to enter text.

Cadmium: Click here to enter text.

Chromium: Click here to enter text.

Copper: Click here to enter text.

Lead: Click here to enter text.

Mercury: Click here to enter text.

Molybdenum: Click here to enter text.

Nickel: Click here to enter text.

Selenium: Click here to enter text.

Zinc: Click here to enter text.

Total PCBs: Click here to enter text.

Provide the following information:

Volume and frequency of sludge to the lagoon(s): Click here to enter text.

Total dry tons stored in the lagoons(s) per 365-day period: Click here to enter text.

Total dry tons stored in the lagoons(s) over the life of the unit: Click here to enter text.

C. Liner information

Does the active/proposed sludge lagoon(s) have a liner with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec?

Yes ☐ No ☐

If yes, describe the liner below. Please note that a liner is required.

Click here to enter text.

D. Site development plan

Provide a detailed description of the methods used to deposit sludge in the lagoon(s):

Click here to enter text.

Attach the following documents to the application.

- Plan view and cross-section of the sludge lagoon(s)

  Attachment: Click here to enter text.
- Copy of the closure plan

  Attachment: Click here to enter text.
- Copy of deed recordation for the site

  Attachment: Click here to enter text.
- Size of the sludge lagoon(s) in surface acres and capacity in cubic feet and gallons

  Attachment: Click here to enter text.
- Description of the method of controlling infiltration of groundwater and surface water from entering the site

  Attachment: Click here to enter text.
- Procedures to prevent the occurrence of nuisance conditions

  Attachment: Click here to enter text.

E. Groundwater monitoring

Is groundwater monitoring currently conducted at this site, or are any wells available for groundwater monitoring, or are groundwater monitoring data otherwise available for the sludge lagoon(s)?

Yes ☐ No ☐

If groundwater monitoring data are available, provide a copy. Provide a profile of soil types encountered down to the groundwater table and the depth to the shallowest groundwater as a separate attachment.

Attachment: Click here to enter text.

Section 12. Authorizations/Compliance/Enforcement

(Instructions Page 63)

A. Additional authorizations

Does the permittee have additional authorizations for this facility, such as reuse authorization, sludge permit, etc?

Yes ☒ No ☐

If yes, provide the TCEQ authorization number and description of the authorization:

The permittee has authorization for reclaimed water use, Authorization R10232001

B. Permittee enforcement status

Is the permittee currently under enforcement for this facility?

Yes ☐ No ☒

Is the permittee required to meet an implementation schedule for compliance or enforcement?

Yes ☐ No ☒

If yes to either question, provide a brief summary of the enforcement, the implementation schedule, and the current status:

Click here to enter text.

Section 13. RCRA/CERCLA Wastes (Instructions Page 63)

A. RCRA hazardous wastes

Has the facility received in the past three years, does it currently receive, or will it receive RCRA hazardous waste?

Yes ☐ No ☒

B. Remediation activity wastewater

Has the facility received in the past three years, does it currently receive, or will it receive CERCLA wastewater, RCRA remediation/corrective action wastewater or other remediation activity wastewater?

Yes ☐ No ☒

C. Details about wastes received

If yes to either Subsection A or B above, provide detailed information concerning these wastes with the application.

Attachment: Click here to enter text.

Section 14. Laboratory Accreditation (Instructions Page 64)

All laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*, which includes the following general exemptions from National Environmental Laboratory Accreditation Program (NELAP) certification requirements:

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

The applicant should review *30 TAC Chapter 25* for specific requirements.

The following certification statement shall be signed and submitted with every application. See the *Signature Page* section in the Instructions, for a list of designated representatives who may sign the certification.

CERTIFICATION:

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

Printed Name: Ryan Kelso

Title: COO, New Braunfels Utilities

Signature: ______________________

Date: 7/25/19

DOMESTIC TECHNICAL REPORT 1.1

The following is required for new and amendment applications

Section 1. Justification for Permit (Instructions Page 66)

A. Justification of permit need

Provide a detailed discussion regarding the need for any phase(s) not currently permitted. Failure to provide sufficient justification may result in the Executive Director recommending denial of the proposed phase(s) or permit.

See Attachment K

B. Regionalization of facilities

Provide the following information concerning the potential for regionalization of domestic wastewater treatment facilities:

1. Municipally incorporated areas

If the applicant is a city, then Item 1 is not applicable. Proceed to Item 2 Utility CCN areas.

Is any portion of the proposed service area located in an incorporated city?

Yes ☒ No ☐ Not Applicable ☐

If yes, within the city limits of: New Braunfels

If yes, attach correspondence from the city.

Attachment: N/A – New Braunfels Utilities is a branch of the City of New Braunfels

If consent to provide service is available from the city, attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the city versus the cost of the proposed facility or expansion attached.

Attachment: Click here to enter text.

2. Utility CCN areas

Is any portion of the proposed service area located inside another utility's CCN area?

Yes ☐ No ☒

If yes, attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the CCN facilities versus the cost of the proposed facility or expansion.

Attachment: Click here to enter text.

3. Nearby WWTPs or collection systems

Are there any domestic permitted wastewater treatment facilities or collection systems located within a three-mile radius of the proposed facility?

Yes ☒ No ☐

If yes, attach a list of these facilities that includes the permittee's name and permit number, and an area map showing the location of these facilities.

Attachment: See Attachment O

If yes, attach copies of your certified letters to these facilities **and** their response letters concerning connection with their system.

Attachment: See Attachment O

Does a permitted domestic wastewater treatment facility or a collection system located within three (3) miles of the proposed facility currently have the capacity to accept or is willing to expand to accept the volume of wastewater proposed in this application?

Yes ☐ No ☒

If yes, attach an analysis of expenditures required to connect to a permitted wastewater treatment facility or collection system located within 3 miles versus the cost of the proposed facility or expansion.

Attachment: Click here to enter text.

Section 2. Organic Loading (Instructions Page 67)

Is this facility in operation?

Yes ☒ No ☐

If no, proceed to Item B, Proposed Organic Loading.

If yes, provide organic loading information in Item A, Current Organic Loading

A. Current organic loading

Facility Design Flow (flow being requested in application): 15.4 MGD

Average Influent Organic Strength or BOD_5 Concentration in mg/l: 310

Average Influent Loading (lbs/day = total average flow X average BOD_5 conc. X 8.34): 39,815 lb/day

Provide the source of the average organic strength or BOD_5 concentration.

Analysis of 12 months of influent sampling

B. Proposed organic loading

This table must be completed if this application is for a facility that is not in operation or if this application is to request an increased flow that will impact organic loading.

Table 1.1(1) – Design Organic Loading

Source	Total Average Flow (MGD)	Influent BOD_5 Concentration (mg/l)
Municipality	15.4	310
Subdivision		
Trailer park – transient		
Mobile home park		
School with cafeteria and showers		
School with cafeteria, no showers		

Source	Total Average Flow (MGD)	Influent BOD_5 Concentration (mg/l)
Recreational park, overnight use		
Recreational park, day use		
Office building or factory		
Motel		
Restaurant		
Hospital		
Nursing home		
Other		
TOTAL FLOW from all sources	15.4	
AVERAGE BOD_5 from all sources		310

Section 3. Proposed Effluent Quality and Disinfection (Instructions Page 68)

A. Existing/Interim I Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: 10

Total Suspended Solids, mg/l: 15

Ammonia Nitrogen, mg/l: ----

Total Phosphorus, mg/l: 3

Dissolved Oxygen, mg/l: 4.0

Other: E. coli = 126 cfu/100 ml

B. Interim II Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: 10

Total Suspended Solids, mg/l: 15

Ammonia Nitrogen, mg/l: 3

Total Phosphorus, mg/l: 1.0

Dissolved Oxygen, mg/l: 4.0

Other: E coli = 126 cfu/100 ml

C. Final Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: 10

Total Suspended Solids, mg/l: 15

Ammonia Nitrogen, mg/l: 3

Total Phosphorus, mg/l: 1.0

Dissolved Oxygen, mg/l: 4.0

Other: Ecoli = 126 cfu/100 ml

D. Disinfection Method

Identify the proposed method of disinfection.

☐ Chlorine: Click here to enter text. mg/l after Click here to enter text. minutes detention time at peak flow

Dechlorination process: Click here to enter text.

☒ Ultraviolet Light: 20 seconds contact time at peak flow

☐ Other: Also see Attachment R – Outfall Use During Expansion Construction

Section 4. Design Calculations (Instructions Page 68)

Attach design calculations and plant features for each proposed phase. Example 4 of the instructions includes sample design calculations and plant features.

Attachment: See Attachment H

Section 5. Facility Site (Instructions Page 68)

A. 100-year floodplain

Will the proposed facilities be located above the 100-year frequency flood level?

Yes ☐ No ☒

If no, describe measures used to protect the facility during a flood event. Include a site map showing the location of the treatment plant within the 100-year frequency flood level. If applicable, provide the size and types of protective structures.

The top of basins within the 100-year flood plain are about the 100 year flood level. There are no motors or electrical equipment located below the 100 year flood level

Provide the source(s) used to determine 100-year frequency flood plain.

FEMA FIRM Panel 480910C0465F - See Attachment P

For a new or expansion of a facility, will a wetland or part of a wetland be filled?

Yes ☐ No ☒

If yes, has the applicant applied for a US Corps of Engineers 404 Dredge and Fill Permit?

Yes ☐ No ☐

If yes, provide the permit number: Click here to enter text.

If no, provide the approximate date you anticipate submitting your application to the Corps: Click here to enter text.

B. Wind rose

Attach a wind rose. **Attachment**: See Attachment Q

Section 6. Permit Authorization for Sewage Sludge Disposal (Instructions Page 69)

A. Beneficial use authorization

Are you requesting to include authorization to land apply sewage sludge for beneficial use on property located adjacent to the wastewater treatment facility under the wastewater permit?

Yes ☐ No ☒

If yes, attach the completed Application for Permit for Beneficial Land Use of Sewage Sludge (TCEQ Form No. 10451)

Attachment: Click here to enter text.

B. Sludge processing authorization

Identify the sludge processing, storage or disposal options that will be conducted at the wastewater treatment facility:

☐ Sludge Composting

☐ Marketing and Distribution of sludge

☐ Sludge Surface Disposal or Sludge Monofill

If any of the above sludge options are selected, attach a completed DOMESTIC WASTEWATER PERMIT APPLICATION: SEWAGE SLUDGE TECHNICAL REPORT (TCEQ Form No. 10056).

Attachment: N/A

Section 7. Sewage Sludge Solids Management Plan (Instructions Page 69)

Attach a solids management plan to the application.

Attachment: See Attachment L

The sewage sludge solids management plan must contain the following information:

- Treatment units and processes dimensions and capacities
- Solids generated at 100, 75, 50, and 25 percent of design flow
- Mixed liquor suspended solids operating range at design and projected actual flow
- Quantity of solids to be removed and a schedule for solids removal
- Identification and ownership of the ultimate sludge disposal site
- For facultative lagoons, design life calculations, monitoring well locations and depths, and the ultimate disposal method for the sludge from the facultative lagoon

An example of a sewage sludge solids management plan has been included as Example 5 of the instructions.

DOMESTIC TECHNICAL REPORT WORKSHEET 2.0

RECEIVING WATERS

The following is required for all TPDES permit applications

Section 1. Domestic Drinking Water Supply (Instructions Page 73)

Is there a surface water intake for domestic drinking water supply located within 5 miles downstream from the point or proposed point of discharge?

Yes ☐ No ☒

If yes, provide the following:

Owner of the drinking water supply: Click here to enter text.

Distance and direction to the intake: Click here to enter text.

Attach a USGS map that identifies the location of the intake.

Attachment: Click here to enter text.

Section 2. Discharge into Tidally Affected Waters (Instructions Page 73)

Does the facility discharge into tidally affected waters?

Yes ☐ **No** ☒

If yes, complete the remainder of this section. If no, proceed to Section 3.

A. Receiving water outfall

Width of the receiving water at the outfall, in feet: Click here to enter text.

B. Oyster waters

Are there oyster waters in the vicinity of the discharge?

Yes ☐ No ☐

If yes, provide the distance and direction from outfall(s).

Click here to enter text.

C. Sea grasses

Are there any sea grasses within the vicinity of the point of discharge?

Yes ☐ No ☐

If yes, provide the distance and direction from the outfall(s).

Click here to enter text.

Section 3. Classified Segments (Instructions Page 73)

Is the discharge directly into (or within 300 feet of) a classified segment?

Yes ☐ No ☒

If yes, this Worksheet is complete.

If no, complete Sections 4 and 5 of this Worksheet.

Section 4. Description of Immediate Receiving Waters (Instructions Page 75)

Name of the immediate receiving waters: Unnamed tributary of Guadalupe River

A. Receiving water type

Identify the appropriate description of the receiving waters.

☒ Stream

☐ Freshwater Swamp or Marsh

☐ Lake or Pond

Surface area, in acres: Click here to enter text.

Average depth of the entire water body, in feet: Click here to enter text.

Average depth of water body within a 500-foot radius of discharge point, in feet: Click here to enter text.

☐ Man-made Channel or Ditch

☐ Open Bay

☐ Tidal Stream, Bayou, or Marsh

☐ Other, specify: Click here to enter text.

B. Flow characteristics

If a stream, man-made channel or ditch was checked above, provide the following. For existing discharges, check one of the following that best characterizes the area *upstream* of the discharge. For new discharges, characterize the area *downstream* of the discharge (check one).

☒ Intermittent - dry for at least one week during most years

☐ Intermittent with Perennial Pools - enduring pools with sufficient habitat to maintain significant aquatic life uses

☐ Perennial - normally flowing

Check the method used to characterize the area upstream (or downstream for new dischargers).

☐ USGS flow records

☐ Historical observation by adjacent landowners

☒ Personal observation

☐ Other, specify: Click here to enter text.

C. Downstream perennial confluences

List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point.

Guadalupe River

D. Downstream characteristics

Do 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, discuss how.

Click here to enter text.

E. Normal dry weather characteristics

Provide general observations of the water body during normal dry weather conditions.

Discharge will be into a dry stream

Date and time of observation: 6/21/19, 10:00 am

Was the water body influenced by stormwater runoff during observations?

Yes ☐ No ☒

Section 5. General Characteristics of the Waterbody (Instructions Page 74)

A. Upstream influences

Is the immediate receiving water upstream of the discharge or proposed discharge site influenced by any of the following? Check all that apply.

☐ Oil field activities
☐ Upstream discharges
☐ Septic tanks
☒ Urban runoff
☐ Agricultural runoff
☐ Other(s), specify Click here to enter text.

B. Waterbody uses

Observed or evidences of the following uses. Check all that apply.

☐ Livestock watering
☐ Irrigation withdrawal
☐ Fishing
☐ Contact recreation
☒ Non-contact recreation
☐ Navigation

☐ Domestic water supply ☐ Industrial water supply

☐ Park activities ☐ Other(s), specify Click here to enter text.

C. Waterbody aesthetics

Check one of the following that best describes the aesthetics of the receiving water and the surrounding area.

☐ Wilderness: outstanding natural beauty; usually wooded or unpastured area; water clarity exceptional

☒ Natural Area: trees and/or native vegetation; 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

DOMESTIC WORKSHEET 4.0

POLLUTANT ANALYSES REQUIREMENTS*

The following is required for facilities with a permitted or proposed flow of 1.0 MGD or greater, facilities with an approved pretreatment program, or facilities classified as a major facility. See instructions for further details.

This worksheet is not required for minor amendments without renewal

Section 1. Toxic Pollutants (Instructions Page 87)

For pollutants identified in Table 4.0(1), indicate the type of sample.

Grab ☐ Composite ☒

Date and time sample(s) collected: 4/2/2019, 08:00

Table 4.0(1) – Toxics Analysis

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Acrylonitrile	< 50	< 50	1	50
Aldrin	< 0.010	< 0.010	1	0.01
Aluminum	130	130	1	2.5
Anthracene	< 10	< 10	1	10
Antimony	< 5	< 5	1	5
Arsenic	0.6	0.6	1	0.5
Barium	18	18	1	3
Benzene	< 10	< 10	1	10
Benzidine	< 50	< 50	1	50
Benzo(a)anthracene	< 5	< 5	1	5

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Benzo(a)pyrene	< 5	< 5	1	5
Bis(2-chloroethyl)ether	< 10	< 10	1	10
Bis(2-ethylhexyl)phthalate	< 10	< 10	1	10
Bromodichloromethane	18.5	18.5	1	10
Bromoform	< 10	< 10	1	10
Cadmium	< 1	< 1	1	1
Carbon Tetrachloride	< 2	< 2	1	2
Carbaryl	< 4	< 4	1	5
Chlordane*	< 0.20	< 0.20	1	0.2
Chlorobenzene	< 10	< 10	1	10
Chlorodibromomethane	< 10	< 10	1	10
Chloroform	34.2	34.2	1	10
Chlorpyrifos	< 0.041	< 0.041	1	0.05
Chromium (Total)	< 3	< 3	1	3
Chromium (Tri) **(*1)**	< 3	< 3	1	N/A
Chromium (Hex)	< 3	< 3	1	3
Copper	<8	<8	1	2
Chrysene	< 5	< 5	1	5
p-Chloro-m-Cresol	< 10	< 10	1	10
4,6-Dinitro-o-Cresol	< 10	< 10	1	50
p-Cresol	< 10	< 10	1	10

Pollutant	**AVG Effluent Conc. (µg/l)**	**MAX Effluent Conc. (µg/l)**	**Number of Samples**	**MAL (µg/l)**
Cyanide **(*2)**	< 10	< 10	1	10
4,4'- DDD	< 0.10	< 0.10	1	0.1
4,4'- DDE	< 0.10	< 0.10	1	0.1
4,4'- DDT	< 0.02	< 0.02	1	0.02
2,4-D	< 0.70	< 0.70	1	0.7
Demeton (O and S)	< 0.0513	< 0.0513	1	0.20
Diazinon	< 0.50	< 0.50	1	0.5/0.1
1,2-Dibromoethane	< 10	< 10	1	10
m-Dichlorobenzene	< 10	< 10	1	10
o-Dichlorobenzene	< 10	< 10	1	10
p-Dichlorobenzene	< 10	< 10	1	10
3,3'-Dichlorobenzidine	< 5	< 5	1	5
1,2-Dichloroethane	< 10	< 10	1	10
1,1-Dichloroethylene	< 10	< 10	1	10
Dichloromethane	< 20	< 20	1	20
1,2-Dichloropropane	< 10	< 10	1	10
1,3-Dichloropropene	< 10	< 10	1	10
Dicofol	< 0.041	< 0.041	1	1
Dieldrin	< 0.020	< 0.020	1	0.02
2,4-Dimethylphenol	< 10	< 10	1	10
Di-n-Butyl Phthalate	< 10	< 10	1	10

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Diuron	< 0.080	< 0.080	1	0.09
Endosulfan I (alpha)	< 0.010	< 0.010	1	0.01
Endosulfan II (beta)	< 0.020	< 0.020	1	0.02
Endosulfan Sulfate	< 0.10	< 0.10	1	0.1
Endrin	< 0.020	< 0.020	1	0.02
Ethylbenzene	<10	<10	1	10
Fluoride	700	700	1	500
Guthion	< 0.0513	< 0.0513	1	0.1
Heptachlor	< 0.010	< 0.010	1	0.01
Heptachlor Epoxide	< 0.010	< 0.010	1	0.01
Hexachlorobenzene	< 5	< 5	1	5
Hexachlorobutadiene	< 10	< 10	1	10
Hexachlorocyclohexane (alpha)	< 0.051	< 0.051	1	0.05
Hexachlorocyclohexane (beta)	< 0.051	< 0.051	1	0.05
gamma-Hexachlorocyclohexane (Lindane)	< 0.051	< 0.051	1	0.05
Hexachlorocyclopentadiene	< 10	< 10	1	10
Hexachloroethane	< 20	< 20	1	20
Hexachlorophene	< 10	< 10	1	10
Lead	< 0.5	< 0.5	1	0.5
Malathion	< 0.0513	< 0.0513	1	0.1

Pollutant	**AVG Effluent Conc. (µg/l)**	**MAX Effluent Conc. (µg/l)**	**Number of Samples**	**MAL (µg/l)**
Mercury	< 0.005	< 0.005	1	0.005
Methoxychlor	< 0.0103	< 0.0103	1	2
Methyl Ethyl Ketone	< 50	< 50	1	50
Mirex	< 0.0103	< 0.0103	1	0.02
Nickel	2	2	1	2
Nitrate-Nitrogen	28800	28800	1	100
Nitrobenzene	< 10	< 10	1	10
N-Nitrosodiethylamine	< 20	< 20	1	20
N-Nitroso-di-n-Butylamine	< 20	< 20	1	20
Nonylphenol	< 333	< 333	1	333
Parathion (ethyl)	< 0.0513	< 0.0513	1	0.1
Pentachlorobenzene	< 20	< 20	1	20
Pentachlorophenol	< 5	< 5	1	5
Phenanthrene	< 10	< 10	1	10
Polychlorinated Biphenyls (PCB's) **(*3)**	< 0.20	< 0.20	1	0.2
Pyridine	< 20	< 20	1	20
Selenium	< 5	< 5	1	5
Silver	< 0.50	< 0.50	1	0.5
1,2,4,5-Tetrachlorobenzene	< 20	< 20	1	20
1,1,2,2-Tetrachloroethane	< 10	< 10	1	10

Pollutant	**AVG Effluent Conc. (µg/l)**	**MAX Effluent Conc. (µg/l)**	**Number of Samples**	**MAL (µg/l)**
Tetrachloroethylene	< 10	< 10	1	10
Thallium	< 0.5	< 0.5	1	0.5
Toluene	< 10	< 10	1	10
Toxaphene	< 0.31	< 0.31	1	0.3
2,4,5-TP (Silvex)	< 0.30	< 0.30	1	0.3
Tributyltin (see instructions for explanation)	----	----	1	0.01
1,1,1-Trichloroethane	< 10	< 10	1	10
1,1,2-Trichloroethane	< 10	< 10	1	10
Trichloroethylene	< 10	< 10	1	10
2,4,5-Trichlorophenol	< 50	< 50	1	50
TTHM (Total Trihalomethanes)	59.9	59.9	1	10
Vinyl Chloride	< 10	< 10	1	10
Zinc	71	71	1	5

(*1) Determined by subtracting hexavalent Cr from total Cr.

(*2) Cyanide, amenable to chlorination or weak-acid dissociable.

(*3) The sum of seven PCB congeners 1242, 1254, 1221, 1232, 1248, 1260, and 1016.

Section 2. Priority Pollutants

For pollutants identified in Tables 4.0(2)A-E, indicate type of sample.

Grab ☐ Composite ☒

Date and time sample(s) collected: 4/2/2019, 08:00

Table 4.0(2)A – Metals, Cyanide, Phenols

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Antimony	< 5	< 5	1	5
Arsenic	0.6	0.6	1	0.5
Beryllium	< 0.5	< 0.5	1	0.5
Cadmium	< 1	< 1	1	1
Chromium (Total)	< 3	< 3	1	3
Chromium (Hex)	< 3	< 3	1	3
Chromium (Tri) (*1)	< 3	< 3	1	N/A
Copper	8	8	1	2
Lead	< 0.5	< 0.5	1	0.5
Mercury	< 0.005	< 0.005	1	0.005
Nickel	2	2	1	2
Selenium	< 5	< 5	1	5
Silver	< 0.5	< 0.5	1	0.5
Thallium	< 0.5	< 0.5	1	0.5
Zinc	71	71	1	5
Cyanide (*2)	< 10	< 10	1	10
Phenols, Total	< 5	< 5	1	10

(*1) Determined by subtracting hexavalent Cr from total Cr.

(*2) Cyanide, amenable to chlorination or weak-acid dissociable

Table 4.0(2)B – Volatile Compounds

Pollutant	**AVG Effluent Conc. (µg/l)**	**MAX Effluent Conc. (µg/l)**	**Number of Samples**	**MAL (µg/l)**
Acrolein	< 50	< 50	1	50
Acrylonitrile	< 50	< 50	1	50
Benzene	< 10	< 10	1	10
Bromoform	< 10	< 10	1	10
Carbon Tetrachloride	< 2	< 2	1	2
Chlorobenzene	< 10	< 10	1	10
Chlorodibromomethane	< 10	< 10	1	10
Chloroethane	< 50	< 50	1	50
2-Chloroethylvinyl Ether	< 10	< 10	1	10
Chloroform	34.2	34.2	1	10
Dichlorobromomethane [Bromodichloromethane]	18.5	18.5	1	10
1,1-Dichloroethane	< 5	< 5	1	10
1,2-Dichloroethane	< 10	< 10	1	10
1,1-Dichloroethylene	< 10	< 10	1	10
1,2-Dichloropropane	< 10	< 10	1	10
1,3-Dichloropropylene [1,3-Dichloropropene]	< 10	< 10	1	10
1,2-Trans-Dichloroethylene	< 10	< 10	1	10
Ethylbenzene	< 10	< 10	1	10
Methyl Bromide	< 50	< 50	1	50
Methyl Chloride	< 50	< 50	1	50
Methylene Chloride	< 20	< 20	1	20
1,1,2,2-Tetrachloroethane	< 10	< 10	1	10
Tetrachloroethylene	< 10	< 10	1	10

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Toluene	< 10	< 10	1	10
1,1,1-Trichloroethane	< 10	< 10	1	10
1,1,2-Trichloroethane	< 10	< 10	1	10
Trichloroethylene	< 10	< 10	1	10
Vinyl Chloride	< 10	< 10	1	10

Table 4.0(2)C – Acid Compounds

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
2-Chlorophenol	< 10	< 10	1	10
2,4-Dichlorophenol	< 10	< 10	1	10
2,4-Dimethylphenol	< 10	< 10	1	10
4,6-Dinitro-o-Cresol	< 10	< 10	1	50
2,4-Dinitrophenol	< 50	< 50	1	50
2-Nitrophenol	< 20	< 20	1	20
4-Nitrophenol	< 50	< 50	1	50
P-Chloro-m-Cresol	< 10	< 10	1	10
Pentalchlorophenol	< 5	< 5	1	5
Phenol	< 10	< 10	1	10
2,4,6-Trichlorophenol	< 10	< 10	1	10

Table 4.0(2)D – Base/Neutral Compounds

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Acenaphthene	< 10	< 10	1	10
Acenaphthylene	< 10	< 10	1	10
Anthracene	< 10	< 10	1	10
Benzidine	< 50	< 50	1	50
Benzo(a)Anthracene	< 5	< 5	1	5
Benzo(a)Pyrene	< 5	< 5	1	5
3,4-Benzofluoranthene	< 10	< 10	1	10
Benzo(ghi)Perylene	< 20	< 20	1	20
Benzo(k)Fluoranthene	< 2.5	< 2.5	1	5
Bis(2-Chloroethoxy)Methane	< 10	< 10	1	10
Bis(2-Chloroethyl)Ether	< 10	< 10	1	10
Bis(2-Chloroisopropyl)Ether	< 2.5	< 2.5	1	10
Bis(2-Ethylhexyl)Phthalate	< 10	< 10	1	10
4-Bromophenyl Phenyl Ether	< 10	< 10	1	10
Butyl benzyl Phthalate	< 10	< 10	1	10
2-Chloronaphthalene	< 10	< 10	1	10
4-Chlorophenyl phenyl ether	< 10	< 10	1	10
Chrysene	< 5	< 5	1	5
Dibenzo(a,h)Anthracene	< 5	< 5	1	5
1,2-(o)Dichlorobenzene	< 10	< 10	1	10
1,3-(m)Dichlorobenzene	< 10	< 10	1	10
1,4-(p)Dichlorobenzene	< 10	< 10	1	10
3,3-Dichlorobenzidine	< 5	< 5	1	5
Diethyl Phthalate	< 10	< 10	1	10
Dimethyl Phthalate	< 10	< 10	1	10

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Di-n-Butyl Phthalate	< 10	< 10	1	10
2,4-Dinitrotoluene	< 10	< 10	1	10
2,6-Dinitrotoluene	< 10	< 10	1	10
Di-n-Octyl Phthalate	< 10	< 10	1	10
1,2-Diphenylhydrazine (as Azo-benzene)	< 20	< 20	1	20
Fluoranthene	< 10	< 10	1	10
Fluorene	< 10	< 10	1	10
Hexachlorobenzene	< 5	< 5	1	5
Hexachlorobutadiene	< 10	< 10	1	10
Hexachlorocyclo-pentadiene	< 10	< 10	1	10
Hexachloroethane	< 20	< 20	1	20
Indeno(1,2,3-cd)pyrene	< 5	< 5	1	5
Isophorone	< 10	< 10	1	10
Naphthalene	< 10	< 10	1	10
Nitrobenzene	< 10	< 10	1	10
N-Nitrosodimethylamine	< 50	< 50	1	50
N-Nitrosodi-n-Propylamine	< 20	< 20	1	20
N-Nitrosodiphenylamine	< 20	< 20	1	20
Phenanthrene	< 10	< 10	1	10
Pyrene	< 10	< 10	1	10
1,2,4-Trichlorobenzene	< 10	< 10	1	10

Table 4.0(2)E - Pesticides

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Aldrin	< 0.010	< 0.010	1	0.01
alpha-BHC (Hexachlorocyclohexane)	< 0.051	< 0.051	1	0.05
beta-BHC (Hexachlorocyclohexane)	< 0.051	< 0.051	1	0.05
gamma-BHC (Hexachlorocyclohexane)	< 0.051	< 0.051	1	0.05
delta-BHC (Hexachlorocyclohexane)	< 0.051	< 0.051	1	0.05
Chlordane	< 0.2	< 0.2	1	0.2
4,4-DDT	< 0.02	< 0.02	1	0.02
4,4-DDE	< 0.10	< 0.10	1	0.1
4,4,-DDD	< 0.10	< 0.10	1	0.1
Dieldrin	< 0.020	< 0.020	1	0.02
Endosulfan I (alpha)	< 0.010	< 0.010	1	0.01
Endosulfan II (beta)	< 0.020	< 0.020	1	0.02
Endosulfan Sulfate	< 0.10	< 0.10	1	0.1
Endrin	< 0.020	< 0.020	1	0.02
Endrin Aldehyde	< 0.10	< 0.10	1	0.1
Heptachlor	< 0.010	< 0.010	1	0.01
Heptachlor Epoxide	< 0.010	< 0.010	1	0.01
PCB-1242	< 0.20	< 0.20	1	0.2
PCB-1254	< 0.20	< 0.20	1	0.2
PCB-1221	< 0.20	< 0.20	1	0.2
PCB-1232	< 0.20	< 0.20	1	0.2

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
PCB-1248	< 0.20	< 0.20	1	0.2
PCB-1260	< 0.20	< 0.20	1	0.2
PCB-1016	< 0.20	< 0.20	1	0.2
Toxaphene	< 0.31	< 0.31	1	0.3

* For PCBS, if all are non-detects, enter the highest non-detect preceded by a "<".

Section 3. Dioxin/Furan Compounds

A. Indicate which of the following compounds from may be present in the influent from a contributing industrial user or significant industrial user. Check all that apply.

☐ 2,4,5-trichlorophenoxy acetic acid
Common Name 2,4,5-T, CASRN 93-76-5

☐ 2-(2,4,5-trichlorophenoxy) propanoic acid
Common Name Silvex or 2,4,5-TP, CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate
Common Name Erbon, CASRN 136-25-4

☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate
Common Name Ronnel, CASRN 299-84-3

☐ 2,4,5-trichlorophenol
Common Name TCP, CASRN 95-95-4

☐ hexachlorophene
Common Name HCP, CASRN 70-30-4

For each compound identified, provide a brief description of the conditions of its/their presence at the facility.

Click here to enter text.

B. Do you 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 your effluent?

Yes ☐ No ☒

If **yes**, provide a brief description of the conditions for its presence.

Click here to enter text.

If any of the compounds in Subsection A **or** B are present, complete Table 4.0(2)F.

For pollutants identified in Table 4.0(2)F, indicate the type of sample.

Grab ☐ Composite ☐

Date and time sample(s) collected: Click here to enter text.

TABLE 4.0(2)F - DIOXIN/FURAN COMPOUNDS

Compound	**Toxic Equivalency Factors**	**Wastewater Concentration (ppq)**	**Wastewater Equivalents (ppq)**	**Sludge Concentration (ppt)**	**Sludge Equivalents (ppt)**	**MAL (ppq)**
2,3,7,8 TCDD	1					10
1,2,3,7,8	0.5					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	0.05					50
2,3,4,7,8 PeCDF	0.5					50
2,3,7,8 HxCDFs	0.1					50
2,3,4,7,8	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					0.5
PCB 81	0.0003					0.5

Compound	**Toxic Equivalency Factors**	**Wastewater Concentration (ppq)**	**Wastewater Equivalents (ppq)**	**Sludge Concentration (ppt)**	**Sludge Equivalents (ppt)**	**MAL (ppq)**
PCB 126	0.1					0.5
PCB 169	0.03					0.5
Total						

DOMESTIC WORKSHEET 5.0

TOXICITY TESTING REQUIREMENTS

The following is required for facilities with a currently-operating design flow greater than or equal to 1.0 MGD, with an EPA-approved pretreatment program (or those that are required to have one under 40 CFR Part 403), or are required by the TCEQ to perform Whole Effluent Toxicity testing. This worksheet is not required for minor amendments without renewal.

Section 1. Required Tests (Instructions Page 97)

Indicate the number of 7-day chronic or 48-hour acute Whole Effluent Toxicity (WET) tests performed in the four and one-half years prior to submission of the application.

7-day Chronic: 0

48-hour Acute: 17

Section 2. Toxicity Reduction Evaluations (TREs)

Has this facility completed a TRE in the past four and a half years? Or is the facility currently performing a TRE?

Yes ☐ No ☒

If yes, describe the progress to date, if applicable, in identifying and confirming the toxicant.

Click here to enter text.

Section 3. Summary of WET Tests

If the required biomonitoring test information has not been previously submitted via both the Discharge Monitoring Reports (DMRs) and the Table 1 (as found in the permit), provide a summary of the testing results for all valid and invalid tests performed over the past four and one-half years. Make additional copies of this table as needed.

Table 5.0(1) – Summary of WET Tests

Test Date	Test Species	NOEC Survival	NOEC Sub-lethal

DOMESTIC WORKSHEET 6.0

INDUSTRIAL WASTE CONTRIBUTION

The following is required for all publicly owned treatment works (POTWs)

Section 1. All POTWs (Instructions Page 99)

A. Industrial users

Provide the number of each of the following types of industrial users (IUs) that discharge to your POTW and the daily flows from each user. See the Instructions for definitions of Categorical IUs, Significant IUs – non-categorical, and Other IUs.

If there are no users, enter 0 (zero).

Categorical IUs:

Number of IUs: 0

Average Daily Flows, in MGD: 0

Significant IUs – non-categorical:

Number of IUs: 0

Average Daily Flows, in MGD: 0

Other IUs:

Number of IUs: 0

Average Daily Flows, in MGD: 0

B. Treatment plant interference

In the past three years, has your POTW experienced treatment plant interference (see instructions)?

Yes ☐ No ☒

If yes, identify the dates, duration, description of interference, and probable cause(s) and possible source(s) of each interference event. Include the names of the IUs that may have caused the interference.

Click here to enter text.

C. Treatment plant pass through

In the past three years, has your POTW experienced pass through (see instructions)?

Yes ☐ No ☒

If yes, identify the dates, duration, a description of the pollutants passing through the treatment plant, and probable cause(s) and possible source(s) of each pass through event. Include the names of the IUs that may have caused pass through.

Click here to enter text.

D. Pretreatment program

Does your POTW have an approved pretreatment program?

Yes ☒ No ☐

If yes, complete Section 2 only of this Worksheet.

Is your POTW required to develop an approved pretreatment program?

Yes ☐ No ☐

If yes, complete Section 2.c. and 2.d. only, and skip Section 3.

If no to either question above, skip Section 2 and complete Section 3 for each significant industrial user and categorical industrial user.

Section 2. POTWs with Approved Programs or Those Required to Develop a Program (Instructions Page 100)

A. Substantial modifications

Have there been any **substantial modifications** to the approved pretreatment program that have not been submitted to the TCEQ for approval according to *40 CFR §403.18*?

Yes ☐ No ☒

If yes, identify the modifications that have not been submitted to TCEQ, including the purpose of the modification.

Click here to enter text.

B. Non-substantial modifications

Have there been any **non-substantial modifications** to the approved pretreatment program that have not been submitted to TCEQ for review and acceptance?

Yes ☐ No ☒

If yes, identify all non-substantial modifications that have not been submitted to TCEQ, including the purpose of the modification.

Click here to enter text.

C. Effluent parameters above the MAL

In Table 6.0(1), list all parameters measured above the MAL in the POTW's effluent monitoring during the last three years. Submit an attachment if necessary.

Table 6.0(1) – Parameters Above the MAL

Pollutant	Concentration	MAL	Units	Date
See attachment				
N				

D. Industrial user interruptions

Has any SIU, CIU, or other IU caused or contributed to any problems (excluding interferences or pass throughs) at your POTW in the past three years?

Yes ☐ No ☒

If yes, identify the industry, describe each episode, including dates, duration, description of the problems, and probable pollutants.

Click here to enter text.

Section 3. Significant Industrial User (SIU) Information and Categorical Industrial User (CIU) (Instructions Page 100)

A. General information

Company Name: 0

SIC Code: 0

Telephone number: 0 Fax number: 0

Contact name: 0

Address: 0

City, State, and Zip Code: 0

B. Process information

Describe the industrial processes or other activities that affect or contribute to the SIU(s) or CIU(s) discharge (i.e., process and non-process wastewater).

N/A

C. Product and service information

Provide a description of the principal product(s) or services performed.

N/A

D. Flow rate information

See the Instructions for definitions of “process” and “non-process wastewater.”

Process Wastewater:

Discharge, in gallons/day: 0

Discharge Type: ☐ Continuous ☐ Batch ☐ Intermittent

Non-Process Wastewater:

Discharge, in gallons/day: 0

Discharge Type: ☐ Continuous ☐ Batch ☐ Intermittent

E. Pretreatment standards

Is the SIU or CIU subject to technically based local limits as defined in the instructions?

Yes ☐ No ☒

Is the SIU or CIU subject to categorical pretreatment standards found in *40 CFR Parts 405-471*?

Yes ☐ No ☒

If subject to categorical pretreatment standards, indicate the applicable category and subcategory for each categorical process.

Category: 0
Subcategories: Click here to enter text.

Category: 0
Subcategories: Click here to enter text.

Category: 0
Subcategories: Click here to enter text.

Category: 0
Subcategories: Click here to enter text.

Category: 0
Subcategories: Click here to enter text.

F. Industrial user interruptions

Has the SIU or CIU caused or contributed to any problems (e.g., interferences, pass through, odors, corrosion, blockages) at your POTW in the past three years?

Yes ☐ No ☒

If yes, identify the SIU, describe each episode, including dates, duration, description of problems, and probable pollutants.

Click here to enter text.

LIST OF ATTACHMENTS
NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

Attachment A – Core Data Form (Admin Report 1.0, Section 3.C)

Attachment B – USGS Map (Admin. Report 1.0, Section 13)

Attachment C – Adjacent and Downstream Landowners (Admin. Report 1.1,Section 1.A and C)

Attachment D – Original Photographs (Admin Report 1.1, Section 2)

Attachment E – Buffer Zone Map (Admin Report 1.1, Section 3.A)

Attachment F – Area Water Wells (Admin Report 1.1, Section 3.C)

Attachment G – Wetlands Map (Admin Report 1.1, Section 3.C and Tech. Report 1.1, Section 5.A)

Attachment H – Supplemental Technical Reports (Tech Report 1.0, Section 2.A and B and Tech Report 1.1, Section 4)

Attachment I – Flow Schematics (Tech Report 1.0, Section 2.C)

Attachment J – Site Drawing (Tech Report 1.0, Section 3)

Attachment K – Justification for Plant Construction (Tech Report 1.0, Section 4 and Tech Report 1.1, Section 1.A)

Attachment L – Sewage Sludge Management Plan (Tech Report 1.0 Section 6.F and Tech. Report 1.1, Item 7)

Attachment M – Final Effluent Analysis (Tech Report 1.0, Section 7, worksheet 4.0)

Attachment N – Effluent Parameters Above the MAL (Worksheet 6.0)

Attachment O – Regionalization Surveys (Tech Report 1.1, Section 1.B.3)

Attachment P – FEMA Flood Map (Tech Rep 1.1, Section 5.A)

Attachment Q – Wind Rose (Tech Report 1.1, Section 5.B)

Attachment R – Outfall Use During Expansion Construction (Tech Report 1.1, Section 3.D)

ATTACHMENT A

CORE DATA FORM

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337

TCEQ Use Only

TCEQ Core Data Form

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 **Renewal and Major Amendment**

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 600522957		**RN 102078011**

SECTION II: Customer Information

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

☐ 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:*

New Braunfels Utilities

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*
	17460017837		

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:
263 Main Plaza

City New Braunfels **State** TX **ZIP** 78130 **ZIP + 4**

16. Country Mailing Information *(if outside USA)*

17. E-Mail Address *(if applicable)*
rkelso@nbutexas.com

18. Telephone Number	**19. Extension or Code**	**20. Fax Number** *(if applicable)*
(830) 608-8890		( ) -

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.)*

South Kuehler Wastewater Treatment Plant

23. Street Address of the Regulated Entity: *(No PO Boxes)*	1608 Coco Drive							
	City	New Braunfels	**State**	TX	**ZIP**	78130	**ZIP + 4**	
24. County	Comal							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:					
26. Nearest City			**State**		**Nearest ZIP Code**
New Braunfels			TX		78130
27. Latitude (N) In Decimal:	29.686472 deg N		**28. Longitude (W) In Decimal:**	98.098109 deg W	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

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)
4952		221320	

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

Treatment of wastewater from domestic and commercial sources

34. Mailing Address:	263 Main Plaza							
	City	New Braunfels	**State**	TX	**ZIP**	78130	**ZIP + 4**	
35. E-Mail Address:	jharrell@nbutexas.com							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(830) 608-8900		( ) -

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: Reuse
	WQ0010232001			R10232001

SECTION IV: Preparer Information

40. Name:	Steve Barry, P.E.	**41. Title:**	Project Engineer
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(281) 363-4039		(281) 363-3459	sbarry@jonescarter.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:	New Braunfels Utilities	**Job Title:**	COO, New Braunfels Utilities
Name*(In Print)* **:**	Ryan Kelso	**Phone:**	(830) 608-8900
Signature:		**Date:**	7/26/19

ATTACHMENT B

USGS MAP

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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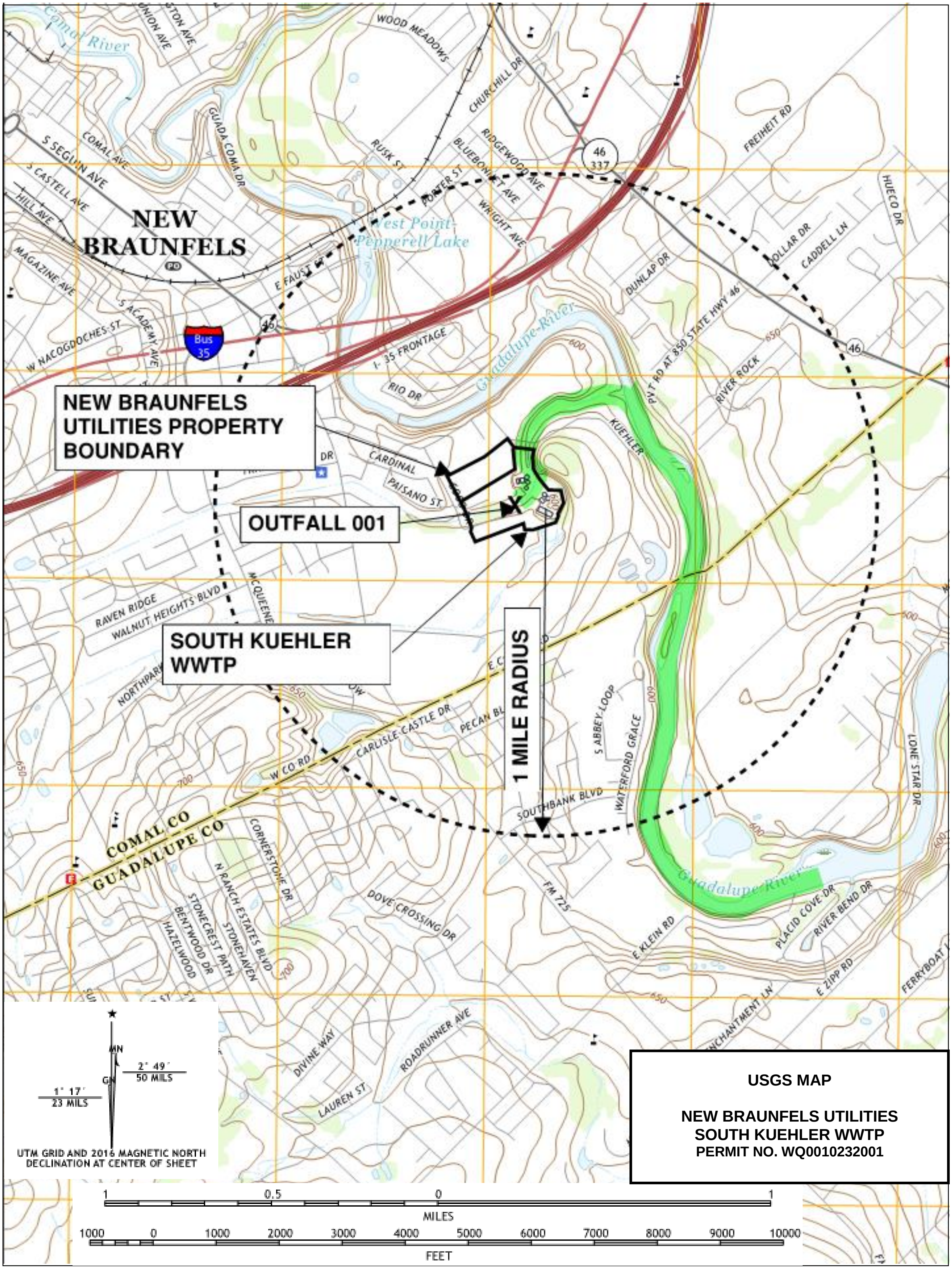

USGS MAP

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WWTP
PERMIT NO. WQ0010232001

ATTACHMENT C

ADJACENT AND DOWNSTREAM LANDOWNERS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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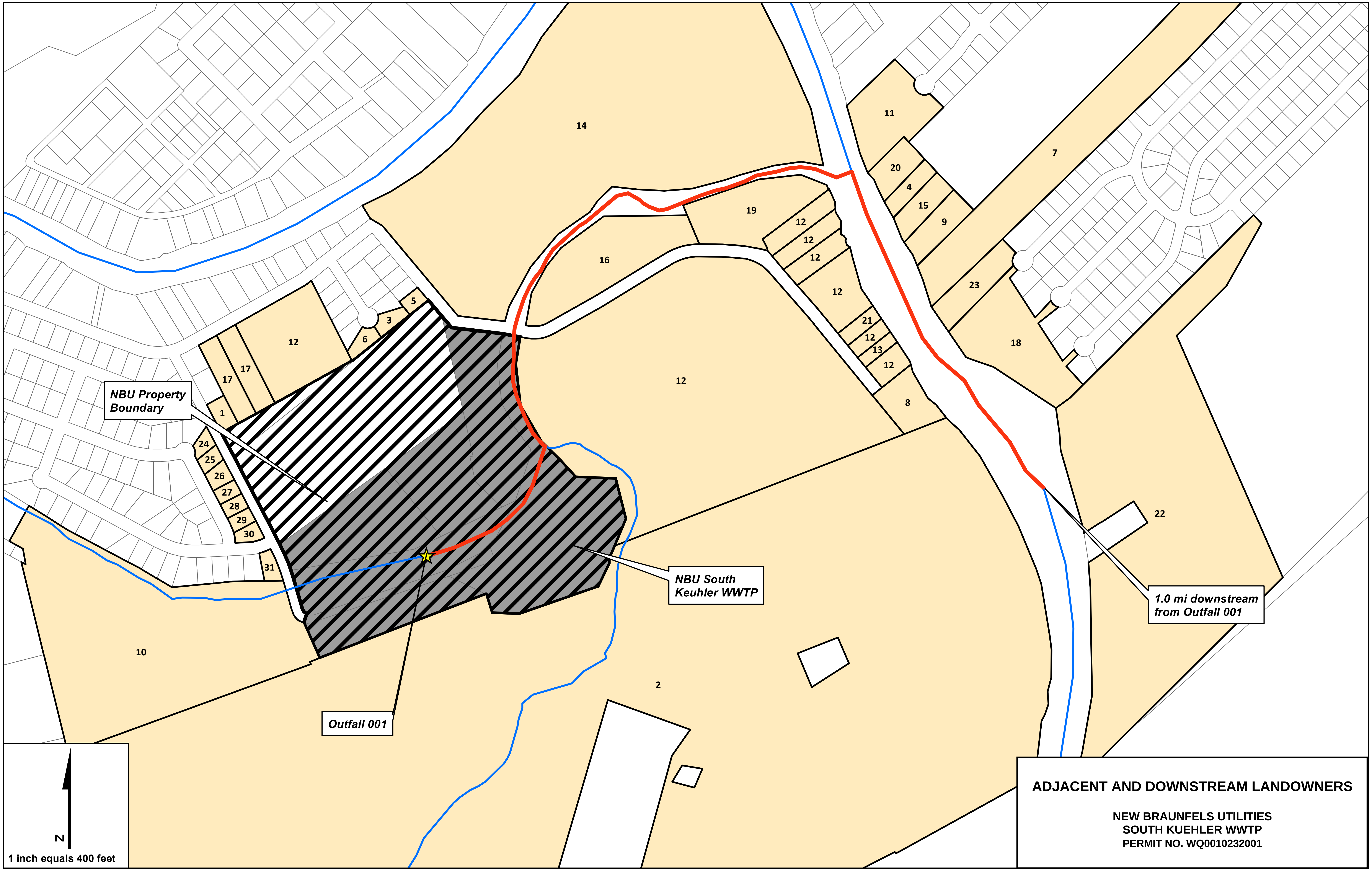

ADJACENT AND DOWNSTREAM LANDOWNERS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WWTP
PERMIT NO. WQ0010232001

Path: D:\Projects\Individual\S_Barry\Permits\NBU\AttC_ver2.mxd Project Number: 05487-0005-00-005-01 Date: 7/8/2019 User Name: JCP

ADJACENT AND DOWNSTREAM LANDOWNERS
NEW BRAUNFELS UTILITIES
SOUTH KEUHLER WASTEWATER TREATMENT PLANT

alt_id	owner	own_addr1	own_city	own_state	own_zip
1	FOOSHEE THOMAS & LAUREN	1419 COCO LANE	NEW BRAUNFELS	TX	78130
2	CAROWEST LAND LTD	112 E PECAN ST STE 175	SAN ANTONIO	TX	78205
3	CASTILLEJA JESUS C & LUCIA	1915 EASTLAWN DR	NEW BRAUNFELS	TX	78130
4	CBP TRUST	842 S HWY 46	NEW BRAUNFELS	TX	78130
5	DELAGARZA BLANCA E	1912 KUEHLER AVE	NEW BRAUNFELS	TX	78130
6	GOMEZ JOE L & MARIA	1910 EASTLAWN DR	NEW BRAUNFELS	TX	78130
7	HARRIS RANDY & KELLYE	850 S HWY 46 #5	NEW BRAUNFELS	TX	78130
8	HERSHEY KEITH F & RUTH	17460 INTERSTATE 35 N STE 160	SCHERTZ	TX	78154
9	HILL SHERRY L	850 HWY 46 S #4	NEW BRAUNFELS	TX	78130
10	HOLLMIG FAMILY PTNRSHP LTD	130 S SEGUIN AVE STE 100	NEW BRAUNFELS	TX	78130
11	JONAS DARRELL J & MAUREEN	4661 SPRING FORK DR	CORPUS CHRISTI	TX	78413
12	KUEHLER ROAD LTD	112 E PECAN ST STE 175	SAN ANTONIO	TX	78205
13	LAYTON DANIEL B	2089 KUEHLER AVE	NEW BRAUNFELS	TX	78130
14	NEW BRAUNFELS CITY OF	550 LANDA ST	NEW BRAUNFELS	TX	78130
15	NIETO RICARDO	850-3 HWY 46 SOUTH	NEW BRAUNFELS	TX	78130
16	R S L R PROPERTIES LLP	1050 TUSCAN RIDGE	NEW BRAUNFELS	TX	78130
17	REID THERESA F	118 SUNSET CIR	SHADY SHORES	TX	76208
18	RIVERTREE PROP OWNERS ASSOC INC	1000 N WALNUT AVE STE 202	NEW BRAUNFELS	TX	78130
19	SCHMIDT RONALD J & JANIE	1150 TUSCAN RDG	NEW BRAUNFELS	TX	78130
20	SHEPHERD MARILYN	850 HWY 46 SOUTH BOX 1	NEW BRAUNFELS	TX	78130
21	VANEPPS CYNTHIA L & GREGORY L POOL	2071 KUEHLER AVE	NEW BRAUNFELS	TX	78130
22	WIND RIVER VALLEY LTD	112 E PECAN ST	SAN ANTONIO	TX	78205
23	BROOKS JOHN & KARION	911 RIVER BANK	NEW BRAUNFELS	TX	78130
24	JF2 ENTERPRISES LLC	220 FRIESENHAHN RD	NEW BRAUNFELS	TX	78132
25	MEINERS MICHAEL G & LISA R	1461 CARDINAL DR	NEW BRAUNFELS	TX	78130
26	FOERSTER GENE R & PATRICIA	1465 CARDINAL DR	NEW BRAUNFELS	TX	78130
27	ERBEN GLEN & MICHELLE	1469 CARDINAL DR	NEW BRAUNFELS	TX	78130
28	AURORA ERICA C	1473 CARDINAL DR	NEW BRAUNFELS	TX	78130

29	WHELAN SANDRA E	1477 CARDINAL DR	NEW BRAUNFELS	TX	78130
30	HEYDEN RICHARD L & CYNDI MILLER	178 LAKEVIEW BLVD	NEW BRAUNFELS	TX	78130
31	JENTSCH JESSICA & ROBERT	362 PAISANO ST	NEW BRAUNFELS	TX	78130

ATTACHMENT D

ORIGINAL PHOTOGRAPHS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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Kuehler Ave
North Kuehler WWTP
3.
4.
Proposed Outfall
5.
6.
2.
South Kuehler WWTP
1.
Coco Dr
© 2018 Google
Google Earth

New Braunfels Utilities, South Kuehler WWTP, 6/20/19 – Picture is of existing wastewater treatment plant. Note headworks in right center of picture

New Braunfels Utilities, South Kuehler WWTP, 6/20/19 – Picture is of area where new construction is to be done. Note the headworks in the left center of picture

New Braunfels Utilities, North Kuehler WWTP, 6/20/19 – Picture is of existing wastewater treatment plant. Note retaining wall in left of picture

New Braunfels Utilities, North Kuehler WWTP, 6/20/19 – Picture is of area where new construction is to be done. Note the retaining wall in right of picture

New Braunfels Utilities, South Kuehler WWTP, 6/20/19 – Picture is of proposed receiving stream, facing upstream. Proposed outfall location is at bottom of center of picture

New Braunfels Utilities, South Kuehler WWTP, 6/20/19 – Picture is of proposed receiving stream, facing downstream. Proposed outfall location is at bottom of center of picture

ATTACHMENT E

BUFFER ZONE DRAWING
AND ODOR ABATEMENT PLAN

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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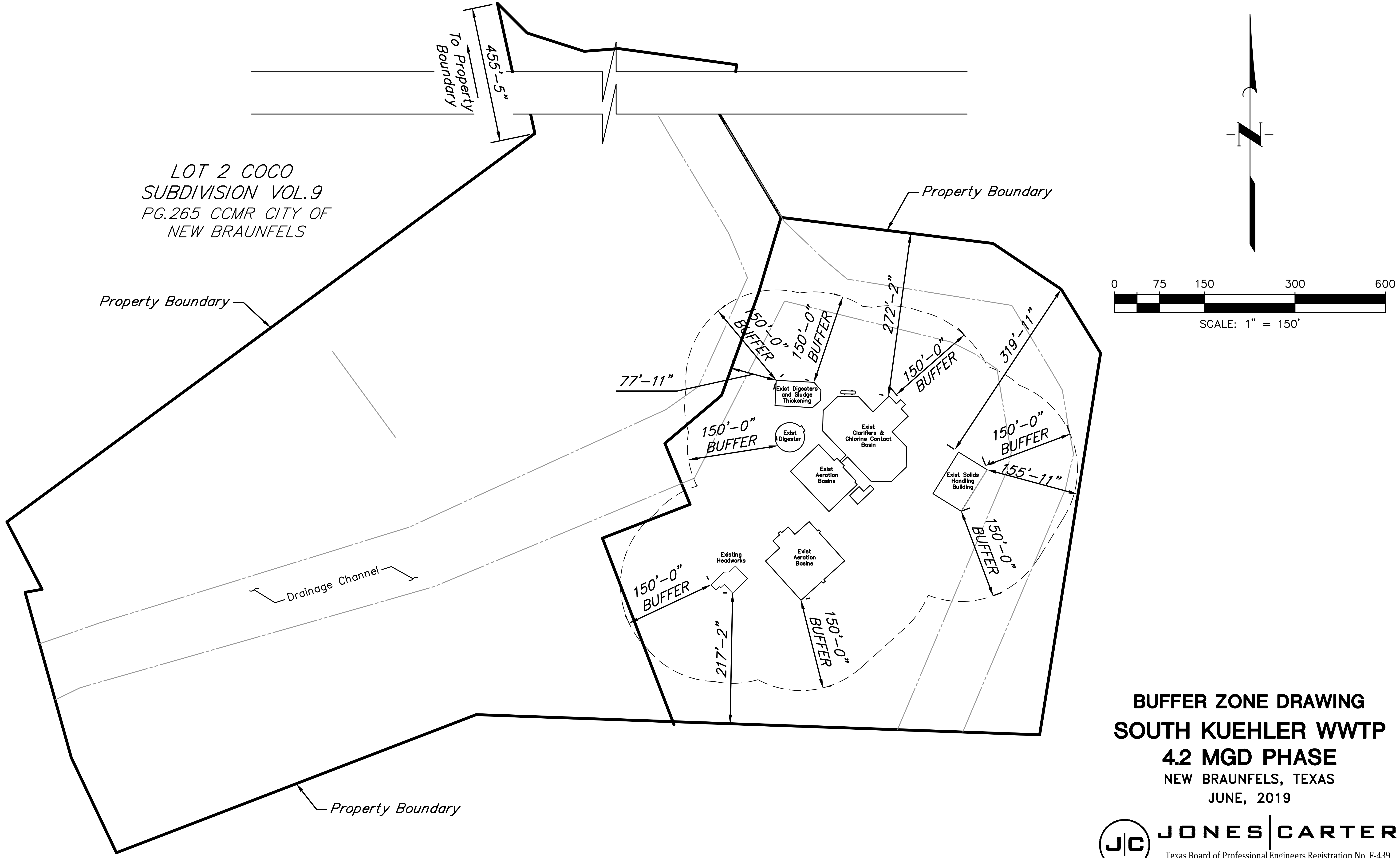

BUFFER ZONE DRAWING

SOUTH KUEHLER WWTP
4.2 MGD PHASE

NEW BRAUNFELS, TEXAS
JUNE, 2019

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Texas Board of Professional Engineers Registration No. F-439
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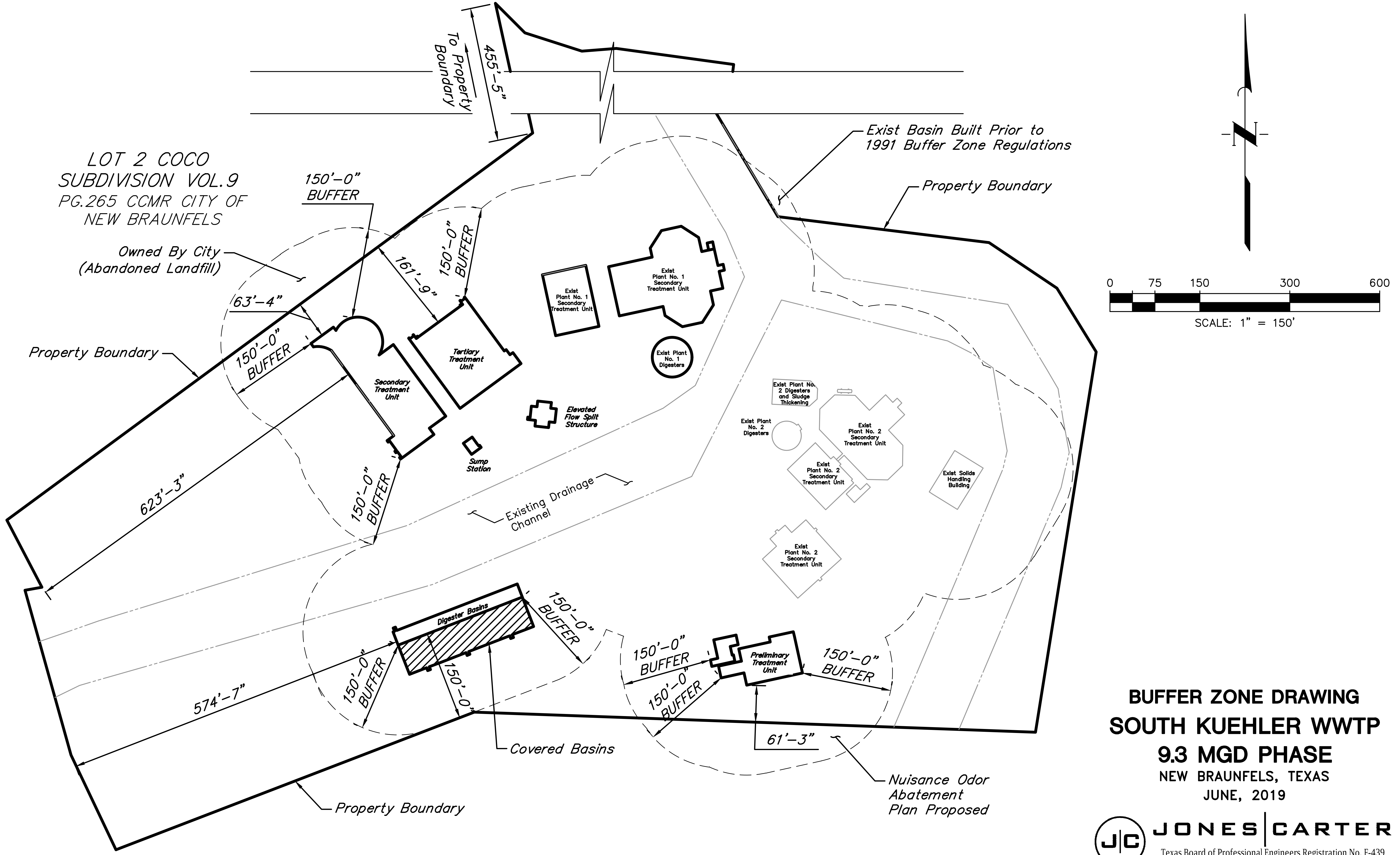

BUFFER ZONE DRAWING

SOUTH KUEHLER WWTP

9.3 MGD PHASE

NEW BRAUNFELS, TEXAS

JUNE, 2019

JONES | CARTER

Texas Board of Professional Engineers Registration No. F-439
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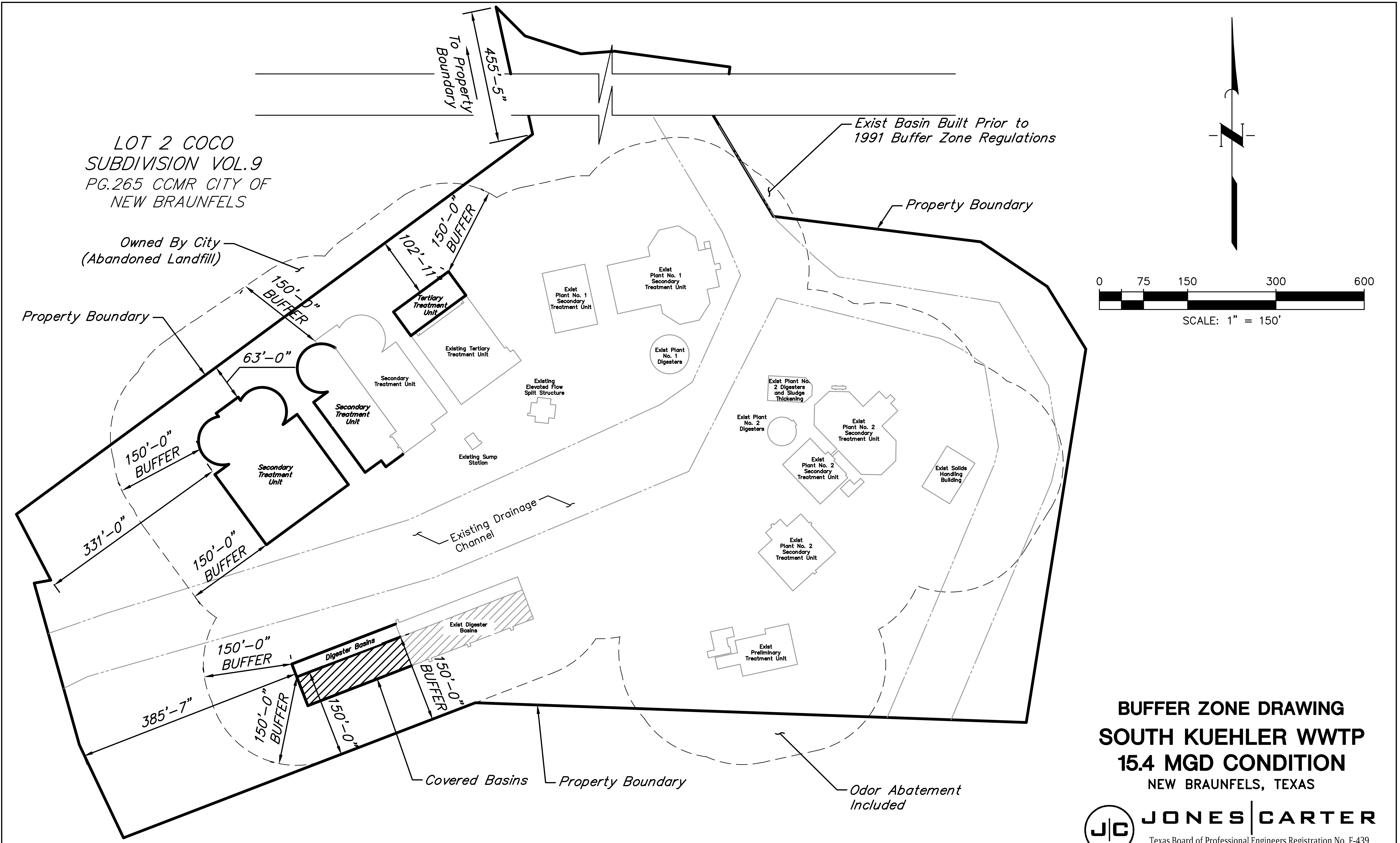

BUFFER ZONE DRAWING

SOUTH KUEHLER WWTP

15.4 MGD CONDITION

NEW BRAUNFELS, TEXAS

J|C JONES|CARTER

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ENGINEERING REPORT
FOR
SOUTH KUEHLER WASTEWATER TREATMENT PLANT
NUISANCE ODOR PREVENTION PLAN
FOR
NEW BRAUNFELS UTILITIES
COMAL COUNTY, TEXAS

K. GRADY TURNER, III
117234

07/08/2019

JULY 2019
J|C Job No. 05487-0005-00

JONES|CARTER

Texas Board of Professional Engineers Registration No. F-439 | Texas Board of Professional Land Surveying Registration No. 10046100

ENGINEERING REPORT
FOR
SOUTH KUEHLER WASTEWATER TREATMENT PLANT
NUISANCE ODOR PREVENTION PLAN
FOR
NEW BRAUNFELS UTILITIES
COMAL COUNTY, TEXAS

TABLE OF CONTENTS

ENGINEERING REPORT:

ATTACHMENTS:

Engineering Report

The following is a report for the approval of a nuisance odor prevention request associated with the proposed preliminary treatment process unit and lift station at the New Braunfels Utilities South Kuehler Wastewater Treatment Plant.

I. Existing Site and Surrounding Land Use

The wastewater treatment plant (WWTP) facility treats sanitary sewer flow from a portion New Braunfels Utilities (NBU) service area. The site is located in southeast Comal County, approximately 0.4 miles south and 0.7 miles east of the intersection at Interstate Highway 35 and Farm to Market Road 725. The facility is located in the City of New Braunfels city limits. Land use surrounding the existing WWTP is comprised of single-family residential housing, an abandoned land fill, an unnamed tributary, and undeveloped land. The location of the WWTP is shown in Appendix A.

Buffer zone compliance will be met by ownership or restrictive easement with the exception of the preliminary treatment unit. Along the southern boundary of the WWTP, the preliminary process treatment unit does not have the minimum buffer zone distance from the neighboring land owner. The minimum required buffer zone is 150 feet (150'); so in order to meet requirements of 30 TAC §217.38 and 30 TAC §309.13 regarding buffer zones, NBU proposes to cover the proposed treatment units and install an odor control system as described below in this report.

II. Existing Climatological and Wastewater Conditions

Climate in the surrounding area is generally mild and warm with an average annual high temperature of 78.6°F and average low temperature of 55.9°F and an average yearly rainfall of approximately 33.98 inches. The information in this section is taken from historical data collected by U.S. Climate Data and is shown in Appendix C. Prevailing wind direction is from the south southeast and south at the velocities shown in Appendix B. Treated effluent from this facility is discharged under TPDES Permit No. WQ0010232003 and WQ0010232001 from North and South Kuehler Wastewater Treatment Plants respectively. As described in the South Kuehler WWTP Major Amendment application, the North Kuehler WWTP TPDES permit will expire and all flow will be combined as part of the South Kuehler WWTP TPDES permit. To accommodate this, all flow will be diverted to a new, common preliminary treatment unit consisting of screening, grit removal, septage receival, and lift station.

Influent to be treated at the WWTP is comprised predominantly of domestic wastewater. No biological treatment occurs prior to this treatment unit.

III. Potential Odor Generating Units

The WWTP facility will be comprised of a new, common preliminary treatment unit, two existing secondary treatment units, two proposed secondary treatment units, a new, common tertiary treatment unit, existing and new aerobic digesters, and a sludge dewatering building. All components other than the preliminary treatment unit comply with buffer zone requirements and do not require a nuisance odor prevention plan. The proposed flow will be 9.30 million gallons per day (MGD) and the future flow will be 15.40 MGD. The preliminary process treatment unit will include mechanical screens, manual screens, aerated grit chambers, a screenings garage, a septage receival unit, and a lift station.

A variance is being request for the buffer zone less than 150 feet (150’). Appendix D is a buffer zone map showing both the proposed and existing facilities.

IV. Proposed Solutions

To control nuisance odors from the preliminary process treatment unit, an odor control system consisting of a biotrickling scrubber (BTS) with a granular activated carbon (GAC) polisher is proposed.

All open basins including screening channels, aerated grit chambers and lift station wet well will be covered with concrete top slabs or stainless steel covers. The screenings garage will be completely enclosed during operation and all equipment including screens and conveyors will include an enclosure that contains all material. All basins, equipment, and the garage will be connected to the proposed odor control system. The BTS and GAC odor control equipment controls nuisance odors by removing air from the enclosed space and forcing it through a bio-membrane film, removing any nuisance odors from the air. This solution will provide a method to prevent nuisance odors, and be adjusted accordingly to the odor characteristics as they change over time.

Appendix E contains information on the BTS and GAC odor control system proposed for the WWTP.

APPENDIX A

WASTEWATER TREATMENT PLANT AERIAL

LEGEND

Comal County Roads

☐ Comal County Parcels

1 inch equals 1250 Feet

JONES|CARTER

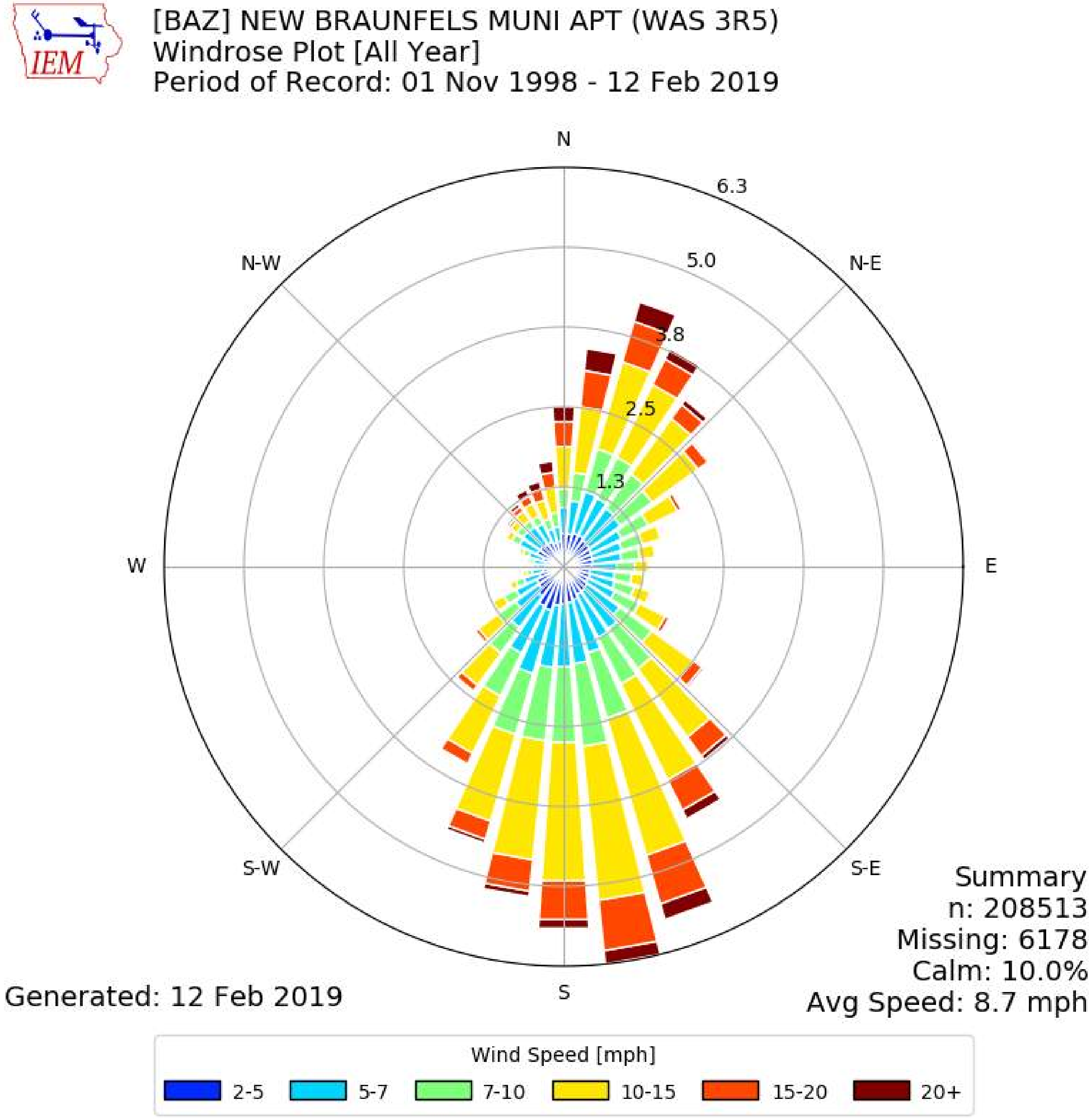
WWTP AERIAL

Notes

This product is offered for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property, governmental and/or political boundaries or related facilities to said boundary. No express warranties are made by Jones & Carter, Inc. concerning the accuracy, completeness, reliability, or usability of the information included within this exhibit. This map was automatically generated using Geocortex Essentials.

APPENDIX B

WIND ROSE


IEM
[BAZ] NEW BRAUNFELS MUNI APT (WAS 3R5)
Windrose Plot [All Year]
Period of Record: 01 Nov 1998 - 12 Feb 2019
N
N-E
E
S-E
S
S-W
W
N-W
6.3
5.0
3.8
2.5
1.3
Summary
n: 208513
Missing: 6178
Calm: 10.0%
Avg Speed: 8.7 mph
Generated: 12 Feb 2019
Wind Speed [mph]
2-5
5-7
7-10
10-15
15-20
20+

APPENDIX C

CLIMATOLOGICAL CONDITIONS

Temperature - Precipitation - Sunshine - Snowfall

US Climate Data on

Home United States Texas

Enter a location

Monthly | Daily | History | Geo & Map | Weather Forecast

You are here: United States > Texas > New Braunfels

Climate New Braunfels - Texas

°C | °F

	Jan	Feb	Mar	Apr	May	Jun
Average high in °F:	61	65	72	79	85	90
Average low in °F:	38	41	48	56	64	70
Av. precipitation in inch:	1.97	1.97	2.6	2.05	3.94	4.76
Days with precipitation:	-	-	-	-	-	-
Hours of sunshine:	-	-	-	-	-	-

	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	93	95	89	81	71	62
Average low in °F:	73	72	66	57	47	39
Av. precipitation in inch:	2.91	2.13	3.03	3.82	2.44	2.36
Days with precipitation:	-	-	-	-	-	-
Hours of sunshine:	-	-	-	-	-	-

Climate data for new braunfels, Longitude: -98.1189, Latitude: 29.7191
Average weather New Braunfels, TX - 78130 - 1981-2010 normals

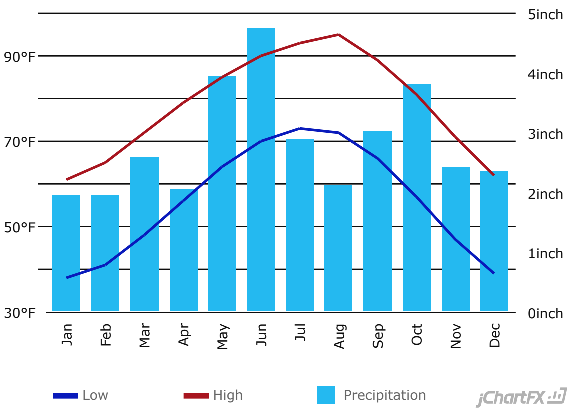
Jan: January, Feb: February, Mar: March, Apr: April, May: May, Jun: June, Jul: July, Aug: August, Sep: September, Oct: October, Nov: November, Dec: December

New Braunfels weather averages

Annual high temperature:	78.6°F
Annual low temperature:	55.9°F
Average temperature:	67.25°F
Average annual precipitation - rainfall:	33.98 inch
Days per year with precipitation - rainfall:	-
Annual hours of sunshine:	-
Av. annual snowfall:	-

11

New Braunfels Climate Graph - Texas Climate Chart

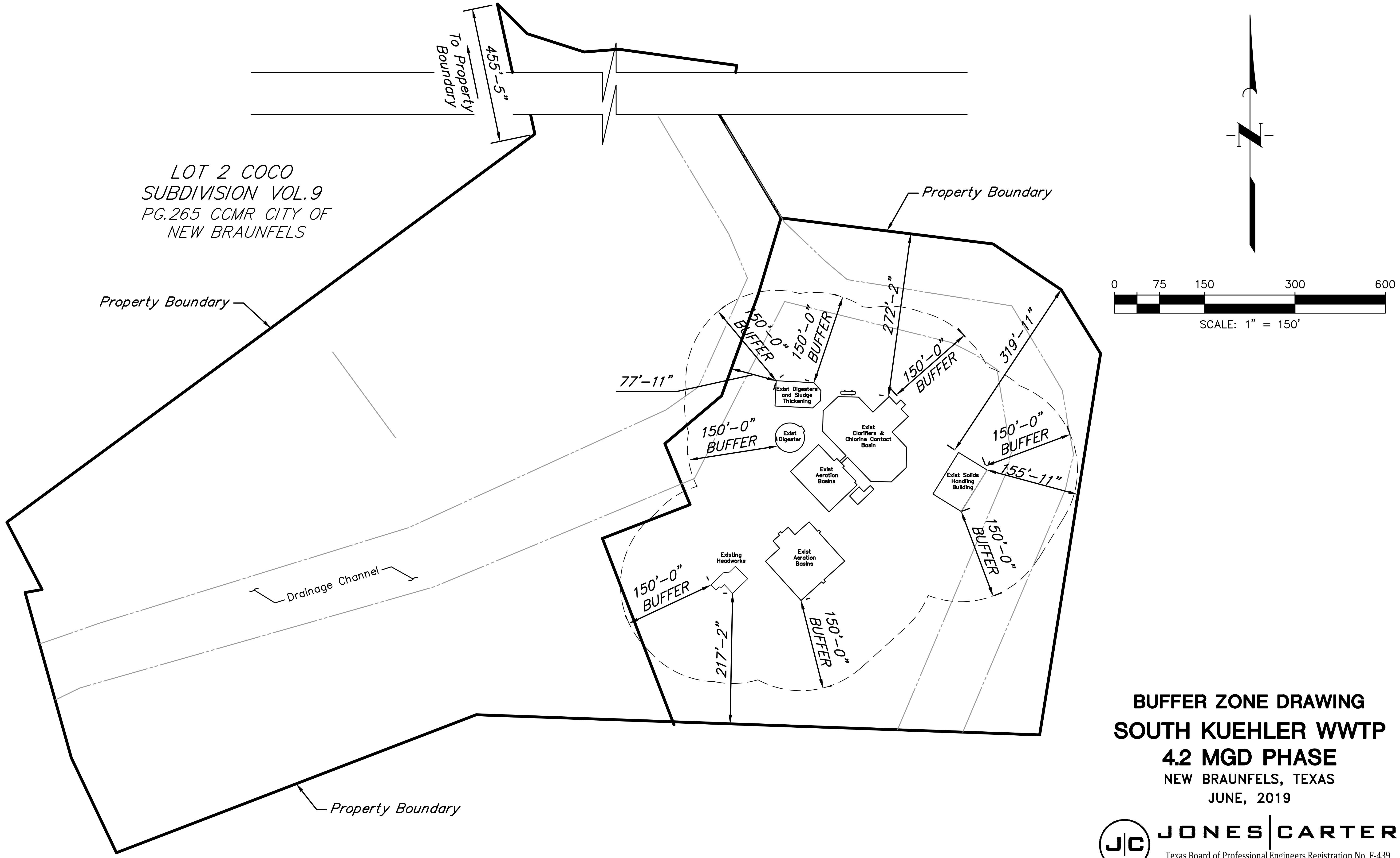


Climograph of New Braunfels on your website

About us | Disclaimer | Co

APPENDIX D

BUFFER ZONE EXHIBITS



BUFFER ZONE DRAWING

SOUTH KUEHLER WWTP
4.2 MGD PHASE

NEW BRAUNFELS, TEXAS
JUNE, 2019

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337

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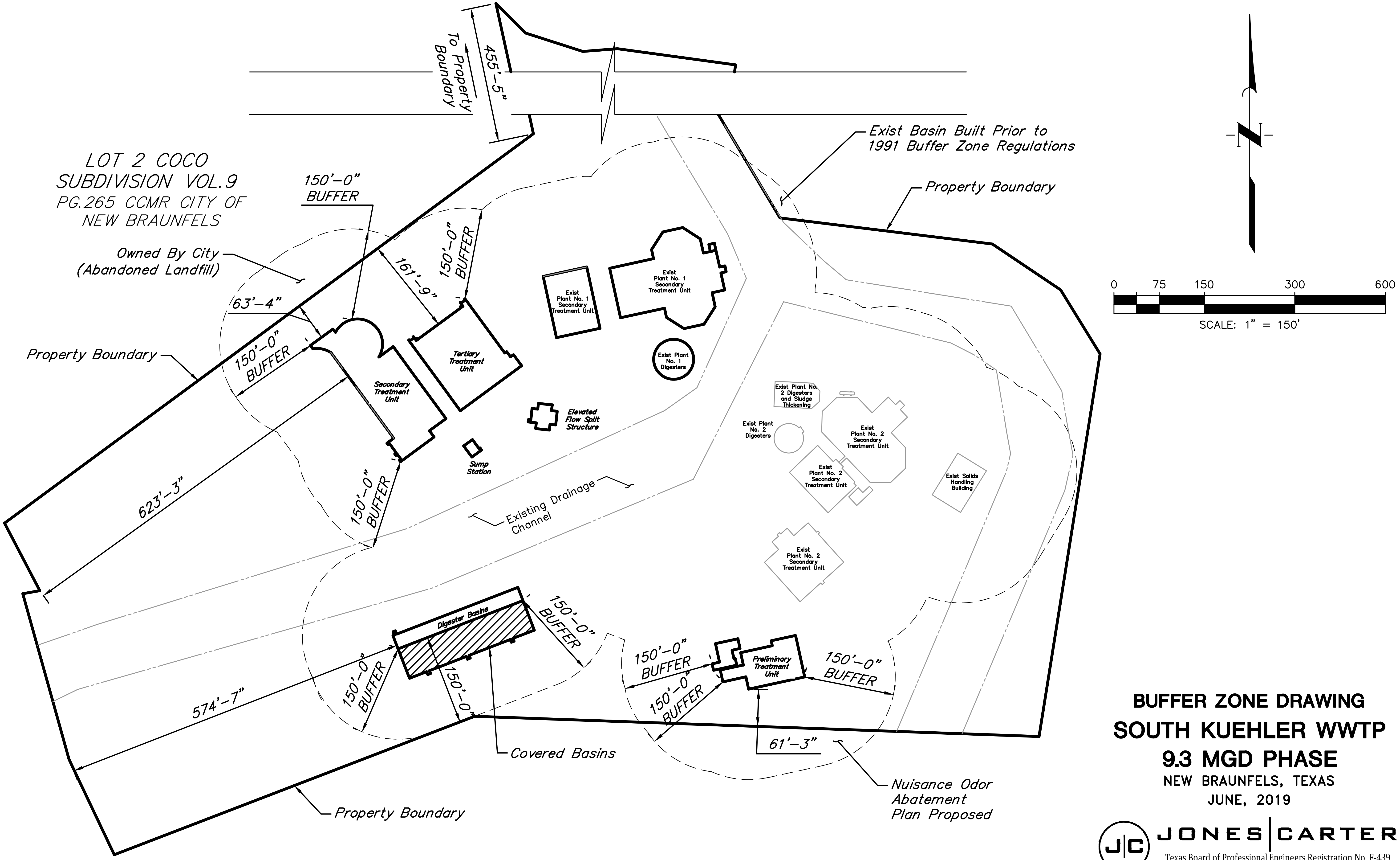

BUFFER ZONE DRAWING
SOUTH KUEHLER WWTP
9.3 MGD PHASE
NEW BRAUNFELS, TEXAS
JUNE, 2019

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337

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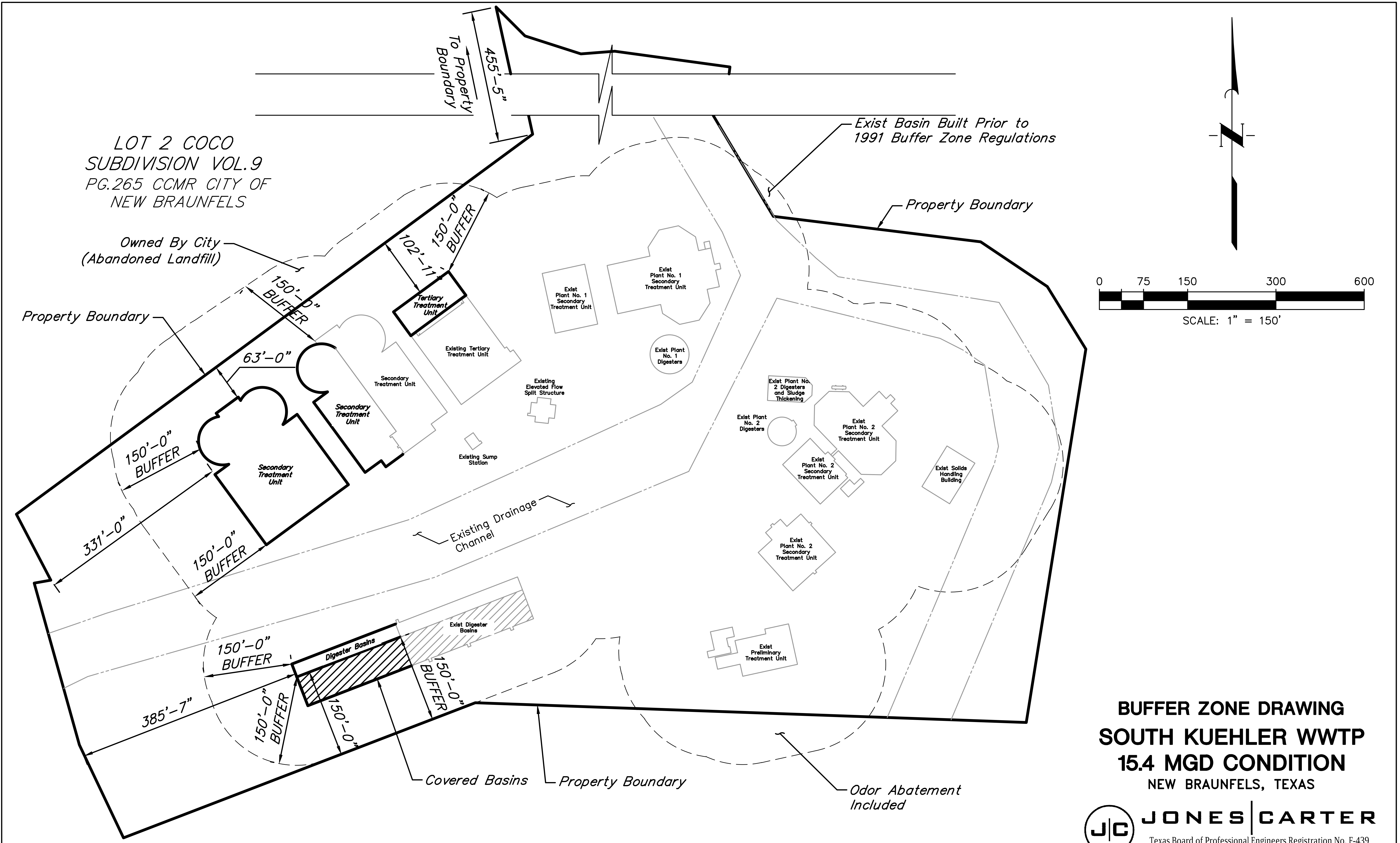

BUFFER ZONE DRAWING

SOUTH KUEHLER WWTP
15.4 MGD CONDITION

NEW BRAUNFELS, TEXAS

JONES | CARTER

Texas Board of Professional Engineers Registration No. F-439
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APPENDIX E

ODOR CONTROL PRODUCT LITERATURE

BIO-TRICKLING SCRUBBER & CARBON POLISHER ODOR CONTROL SYSTEM

FOR

NEW BRAUNFELS UTILITIES
N & S KUELER WWTP
NEW BRAUNFELS, TX

Proposal #M18-146
Prepared on November 20, 2018

SALES REPRESENTATIVE

Curtis Cathey
Manufacturers' Representative
Environmental Improvements, Inc.
e: ccathey@ei2austin.com
p: 512.295.3733
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EVOQUA
WATER TECHNOLOGIES

November 20, 2018

K. Grady Turner III, P.E.
Assistant Department Manager
JONES | CARTER Engineering
6330 West Loop South, Suite 150
Bellaire, Texas 77401
Telephone 713.777.5337
Ref: Odor Control System for New Braunfels Utilities – N & S Kuehler WWTP

Dear Mr. Turner,

Thank you for your continued interest in Evoqua's odor control system for this project. Attached please find our technical proposal for the Biotrickling Filter and Carbon Adsorber Odor Control Systems. For this application with 15,000 cfm, we have considered our BTF-1446 followed by our RJC-1300D system. The systems are based on the following design criteria:

DESIGN AND PERFORMANCE REQUIREMENTS

System Location	Outdoors
EVOQUA MODEL NO	BTF-1446 + RJC-1300D
Air Flow Rate per System	15,000 cfm
Average/Peak inlet H_2S concentration	25 ppm/ 350 ppm
Total media retention time (EBRT) – Bio-Trickling Filter	BTF-1446 14.8 seconds
Total media retention time (EBRT) – Carbon Adsorber	BTF-1300D 3.1 seconds
Overall H2S Removal efficiency	99.5% or less than 0.1 ppm whichever is greater

Bio-Trickling Filter System

Evoqua Water Technologies' BTF system is a counter-current biotrickling filter tower manufactured of premium vinyl ester FRP. It consists of biotrickling tower including a mass transfer zone for gas absorption, integral sump, mist eliminator, and skid-mounted process support equipment including duty/standby recirculation pumps, nutrient storage tank, duty/standby nutrient pumps, piping, valves, fittings, instrumentation and controls to make a complete and functional system.

§ Premium vinyl ester FRP construction for superior strength, corrosion resistance and long life
§ Non-proprietary, commercially available nutrient to enhance and accelerate the growth of autotrophic bacteria
§ Nutrient storage tank with nutrient pumps enhances the health of bacteria

§ Magnetic seal-less recirculation pumps provide continuous irrigation to ensure media has optimum conditions to promote growth and ability to handle periodic peaks
§ Integral mist eliminator removes any spray carryover at exhaust stack
§ Two-stage system with multi-mode capability to provide flexible operation and optimum conditions for site specific applications

Carbon Polisher System

Evoqua's carbon polisher system includes high H2S capacity Midas OCM media. Evoqua's Midas media is a virgin bituminous coal based media that is not impregnated. The Midas media has a very high adsorption capacity exceeding 0.30 grams of H_2S adsorption for each cubic centimeter of carbon, giving it a capacity four to five times greater than other types of media. The Midas media also does not require a mist eliminator reducing overall equipment footprint and pressure drop.

Process Support Equipment

The Bio-Trickling Filter System includes a factory-assembled process support skid. Duty and standby exhaust fans and an electrical control panel are included for a complete odor control system. Evoqua has included a typical layout diagram with ductwork for illustration purposes only. We can provide a layout to suit the actual job site. All budgetary pricing EXCLUDES ductwork and dampers.

Evoqua's budgetary Design Proposal is attached. We look forward to working with you on this project. If we can be of any further assistance, please do not hesitate to contact us.

Sincerely,

Heather Davis-Freymuth
Technical Sales Engineer

cc: Mr. Curtis Cathey, Environmental Improvements, Inc.
Mr. Paul Kranz, Evoqua Water Technologies

The scope of supply and pricing are based on Evoqua's standard equipment selection, standard terms of sale and warranty terms. Any variations from these standards may affect this budgetary quotation. Additionally, please note that <u>this budgetary quotation is for review and informational purposes only and does not constitute an offer for acceptance.</u>

All of the information set forth in this quotation is confidential and/or proprietary and has been prepared solely for the recipient's use in considering the purchase of the equipment and/or services described herein. Transmission of all or any part of this information to others, or use by the recipient, for other purposes is expressly prohibited without Evoqua Water Technologies prior written consent.

SECTION 1

TECHNICAL INFORMATION

PROCESS DESCRIPTION

Evoqua Water Technologies' BTF odor control system is manufactured of FRP. All system components are mounted on the vessel and pre-assembled, pre-piped and pre-wired to the greatest extent possible. The unique design minimizes the system footprint while still providing a high ventilation flow rate

The biological media are randomly dumped in the BTF tower, much like packing media in a conventional scrubber. The bacteria adhere to the media surfaces, and thus come in intimate contact with the H_2S in the air stream. The odorous air flows upward through the media, while water containing nutrients and bacteria is trickled down over the top of the media. The counter current flow enhances mass transfer to the wetted media surfaces, where the biological sulfur-oxidation process takes place. Sulfuric acid and other soluble sulfates are the byproducts of the biological reaction, and are absorbed and removed with the irrigation water. The irrigation water leaves the BTF at a pH around 2

The BTF is first started by inoculation with activated sludge in the recirculating solution. The activated sludge contains millions of bacteria, including several species of sulfur-oxidizing bacteria. As sulfur is oxidized, the pH of the recirculating water drops, and only bacteria that can survive in low pH conditions remain active. In this way the system preferentially favors the growth of sulfur-oxidizing, acidophilic bacteria. As the sulfur-oxidizing bacteria population increases, the H2S removal improves. The population will stabilize in proportion to the average influent H2S load (ppm and flow rate). In about 3-4 weeks the BTF removal efficiency increases from less than 5% to greater than 99%.

Evoqua Water Technologies' BTF odor control systems use a non-proprietary, commercially available fertilizer to provide essential nutrients to optimize the growth of sulfur-oxidizing bacteria. The addition of small amounts of nutrient accelerates the acclimation process, and improves the H2S removal efficiency of the system. This non-hazardous nutrient mix is injected continuously into the irrigation water.

Evoqua Water Technologies' Carbon Polisher Odor Control System is a once-through adsorption system. Odorous compounds (H2S and other malodorous organics) are removed from the air stream through adherence to the activated carbon porous surface. The necessary equipment for the activated carbon adsorption process consists of activated carbon bed(s), grounding rod, and ducting.

Foul air containing residual H2S and other odorous compounds is collected from the bioscrubber and the air is passed to the adsorber. After entering the vessel, the foul air flows through a densely packed bed of activated carbon media. The bed consists of 3 feet of pelletized anthracite carbon media. The activated carbon removes the hydrogen sulfide and other odor causing organic constituents at high removal efficiency. The cleaned air continues through the vessel and is exhausted through the stack.

SYSTEM FEATURES

The Evoqua BTF offers several advantages over other biological odor control systems on the market. Some of the key features are listed below.

1. **Low Pressure Drop** – The arrangement of the media allows air flow to pass through the media easily, thereby enabling relatively high air flow rates with very low pressure drop, comparable to conventional packed systems.

2. **Small Footprint** – The high surface area, low-pressure drop combine to allow operation at higher velocities and lower residence times than other biological odor control systems. For a given air flow rate this translates into smaller footprint, smaller equipment, and lower capital cost.

3. **Biological Nutrient for H_2S removal** – ZABOCS odor control systems use a non-proprietary, commercially available fertilizer to provide essential nutrients to optimize the growth of sulfur-oxidizing bacteria. The addition of small amounts of nutrient accelerates the acclimation process, and improves the H2S removal efficiency of the system. Principal ingredients include 12% urea Nitrogen, 4% phosphate, 8% soluble potash, and 0.1% chelated iron.

4. **Evoqua Water Technologies, LLC, Vapor Phase Odor Control** - With more than 2700 installations, Evoqua is the market leader in Municipal Odor Control technologies, no other supplier has the depth of experience and know how that Evoqua brings to this project. Our wide range of odor control technology options including Biological Scrubbers, Biofilters, Chemical Scrubbers and Carbon Adsorbers assures the right technology for your application.

5. **Reliability in Design and Fabrication** – Evoqua Water Technologies' BTF system incorporates many design innovations. Some of these include:
   - Non-proprietary, commercially available nutrient for preferential and accelerated growth of autotrophic bacteria that remove H_2S as well as metabolize organic compounds.
   - Low pressure drop and long media life.
   - Atmospheric sump for easy access to sump liquid during operation
   - Extensive Quality Control inspection in accordance with ASTM guidelines, including hardness and wall thickness measurements.

ATTACHMENTS

- Table 1: BTF Design and Performance Criteria
- Table 2: BTF Major System Components Sizing
- Table 3: RJC Design and Performance Criteria & System Sizing
- Table 4: RJC Estimated Carbon Life
- Evoqua’s ZABOCS Bio-Trickling Filter System Brochure
- Evoqua’s RJC-Series Carbon Adsorber Brochure
- Evoqua’s Midas OCM Media Brochure
- Fan Cut-Sheets

EVOQUA WATER TECHNOLOGIES

BIOTRICKLING FILTER ODOR CONTROL EQUIPMENT

TABLE 1: DESIGN & PERFORMANCE CRITERIA

N & S KUEHLER WWTP

File No. M18-146

I. DESIGN SPECIFICATIONS AND PERFORMANCE REQUIREMENTS:

	BTF-1446
System Tag No.:	BTF-001
Total Air Flow Rate, cfm	15,000
Number of BTF towers	1
Average Inlet H2S Conc., ppm	25
Peak Inlet H2S Conc., ppm	350
Average H2S Removal Capacity	99.0% removal of inlet concentration or ≤ 0.5 ppm average at outlet, whichever is greater

II. SYSTEM PERFORMANCE CALCULATIONS:

A. Operating Parameters

Tower Diameter, ft	14.00
Empty Bed Residence Time, sec	14.8
Overall Tower Height, ft	29.83
Liquid Recirculation Rate, gpm	125.0
Tower Sump Operating pH	1.6 to 3.0

B. Estimated Pressure Drop:

Pressure Drop/ft. of Packing, in. WC	0.37
Total Packing Height, ft	24.00
Pressure Drop through Packing, in. WC	8.88
Mist Eliminator Losses, in. WC	0.50
Other Internal Losses, in. WC	0.62
Total Losses, in. WC	10.00
20% Safety Factor, in. WC	2.00
Bioscrubber Design Pressure Drop, in. WC	12.00

C. Packing Media Characteristics:

Packing Media:	PUF 40 x 40 x 40 Random Packed

D. Exhaust Fan:

Air Flow Capacity, acfm	15,000
Upstream Duct Losses up to Fan Inlet, in W.C.	2.00
Duct Losses between Fan Outlet & Bioscrubber Inlet, in W.C.	0.50
Pressure Drop across Bioscrubber, in WC	12.00
Duct Losses between Bioscrubber Outlet & Carbon Adsorber Inlet, in W.C.	1.50
Pressure Drop across Carbon Adsorber, in WC	3.50
Total SP, in WC	19.50
BHP	60.20
Motor HP	75.0

TABLE 2: MAJOR SYSTEM COMPONENTS & ESTIMATED UTILITIES REQUIREMENTS
GRUENE ROAD WRF

evoqua
WATER TECHNOLOGIES

A.	**Scrubber Towers:**	**BTF-1446**
	Tower Diameter, ft	14.00
	Straight Shell Height, ft	
	Vessel Inlet Flange Size, ft x ft	7.0 x 1.75
	Inlet Velocity, fpm	1,224
	Vessel Exhaust Stack Dia., ft	3.00
	Exhaust Velocity, fpm	2,122
	Sump Liquid Height, ft	2.00
	Sump Diameter, ft	14.00
	Sump Capacity, gallons	2,303
	Sump Liquid Retention Time, min	18.4
	Scrubber Height:	
	Straight Shell Height, ft	37.50
	Top of Dished Head, ft	39.93
	Top of Exhaust Flange, ft	40.43
	Top of Exhaust Stack, ft	45.20
B.	**Tower Internals:**	
	Packing Support	FRP Grating, 1.5" Thick
	Scrubber Packing Media	PUF 40 x 40 x 40
		Random Packed
	Recirculation Liquid Distributor	(1) Full Cone Spray Nozzle per header
	Number of Spray Headers	Two (2)
	Demister	Chevron Type
C.	**Recirculation Pump:**	
	Total Flow Capacity, gpm	125
	TDH, ft.	81
	Motor Horsepower	7.5
	Manufacturer / Model	Iwaki America/MX-505
D.	**Make-up Water [Plant Effluent]**	
	Flow Rate, Recirculation Mode (continuos), gpm - Normal Operation	3 - 5
	Flow Rate, Intermittent Mode (~1 min cycle per 30 minutes), gpm	110.00
	Pressure, psig - Minimum	50.00
	Pressure, psig - Maximum	60.00
E.	**Make-up Water [Plant Effluent] Requirements**	
	pH	6.0 - 8.0
	COD, ppm:	100
	BOD, ppm:	30
	Hardness, ppm CaCO3 (at pH = 2):	350
	Temperature, Deg. F:	60 - 95
	Residual Chlorine, ppm Cl:	< 3.0
	TSS, ppm:	< 10.0
	TDS, ppm:	< 2,000
	Total Nitrogen, mg N/L	15.0 - 20.0
	Total Phosphorous, mg P/L	10.0 - 15.0
	Total Potassium, mg K/L	10.0 - 15.0

CARBON ADSORBER ODOR CONTROL EQUIPMENT
TABLE 3: DESIGN & PERFORMANCE CRITERIA,
MAJOR SYSTEM COMPONENTS
KUEHLER WWTP

I. DESIGN SPECIFICATIONS AND PERFORMANCE REQUIREMENTS:

	RJC-1300-D
System Tag No.:	CA-001
Total Air Flow Rate, cfm	15,000
Number of Carbon Adsorbers	1
Average Inlet H2S Conc., ppm	0.5
Average H2S Removal Capacity	Inlet H2S >10 ppm: 99.0% removal Inlet H2S 1-10 ppm: 0.1 ppm at outlet

II. MAJOR SYSTEM COMPONENTS:

A. Carbon Adsorber Vessel:

Tower Diameter, ft	13.00
Straight Shell Height, ft	15.25
Number of Beds	2.0
Carbon Bed Height per Bed, ft	3.0
Superficial Velocity, fpm	56.51
Pressure Drop through Carbon Bed, in. WC	3.5
Total Carbon Media Weight, lbs	21,731

B. Carbon Media:

Type of Carbon	MIDAS OCM

C. Ductwork Accessories:

FRP Isolation Damper with Chainwheel

D. Miscellaneous Accessories:

Carbon Sample Ports, 3 per bed (6 total per vessel)
Grounding Rod, 1 per bed (2 total per vessel)
Air Sample Ports, (3 total per vessel)
Differential Pressure Gauge, 1 per bed (2 total per vessel)
Differential Pressure Gauge Pressure Taps, (3 total per vessel)
Drain Valve, (1 total per vessel)

TABLE 4: ESTIMATED CARBON LIFE
KUEHLER WWTP

I. ESTIMATED CARBON LIFE:

CAUTION: The life of carbon depends on several factors including all odor compounds in the incoming air stream which can be adsorbed on carbon, and the humidity of the air stream. The carbon life is presented as an estimate only and Evoqua Water Technologies LLC does not guarantee any life cycle for the carbon.

NOTE: As a minimum, the carbon media physical properties should be checked every five (5) years for compaction over time.

Total Air Flow Rate, cfm	15,000
Average Inlet H2S Conc., ppm	0.50
Average H2S Removal Capacity	Inlet H2S >10 ppm: 99.0% removal Inlet H2S 1-10 ppm: 0.1 ppm at outlet

At Average Inlet H2S Conc.

Carbon Capacity, g H2S/cc carbon	0.30
Average Carbon Density, g carbon/cc	0.45
Carbon Capacity, g H2S/g carbon	0.67
Total Carbon in System, lbs.	21,731
Usable Carbon @ Breakthrough (80% of Capacity), lbs.	17,385
Lbs of H2S Adsorbed for Usable Carbon in System	11,720
Lbs H2S/day	0.95
Theoritical Carbon Life, days	12,290
Theoritical Carbon Life, years	33.7
Estimated Carbon Life, years	5-10

BTF BIOSCRUBBER
ODOR CONTROL SYSTEM

BTF BIOSCRUBBER

The patented BTF Bioscrubber is a bio-trickling scrubber system which uses sulfur-oxidizing bacteria to remove H_2S and organic odors from odorous air.

Bioscrubbers are characterized by their very low operating cost, and ability to handle very high H_2S concentrations up to and exceeding 1000 ppm. They are especially well suited for treating raw sewage odors as found in pump stations, headworks operations, and primary sedimentation.

PROCESS DESCRIPTION

The BTF bioscrubber uses random packed polyurethane foam (PUF) cubes as the support media for biomass growth. The media bed is irrigated with water and nutrients either continuously or intermittently. Maekup water is added to maintain the pH in a safe range, typically between pH=1 and 2. This provides an optimum environment for the preferential growth of acidophilic, sulfur-oxidizing bacteria.

The PUF media has a very high H_2S elimination capacity, in the range of 80 to 100 gm/m^3/hr. Better than 99% H_2S removal can be achieved at an empty bed residence time (EBRT) from 8 to 10 sec. Better than 90% odor removal is usually achived with BRT between 15 to 20 sec.

BTF DESIGN PARAMETERS

Each BTF is custom sized to optimize the performance for each application, based on the air flow rate, H_2S and organic odor concentrations, and % removal required. BTF systems can be designed to treat from 1,000 cfm to 15,000 cfm in a single 6-ft to 12-ft.

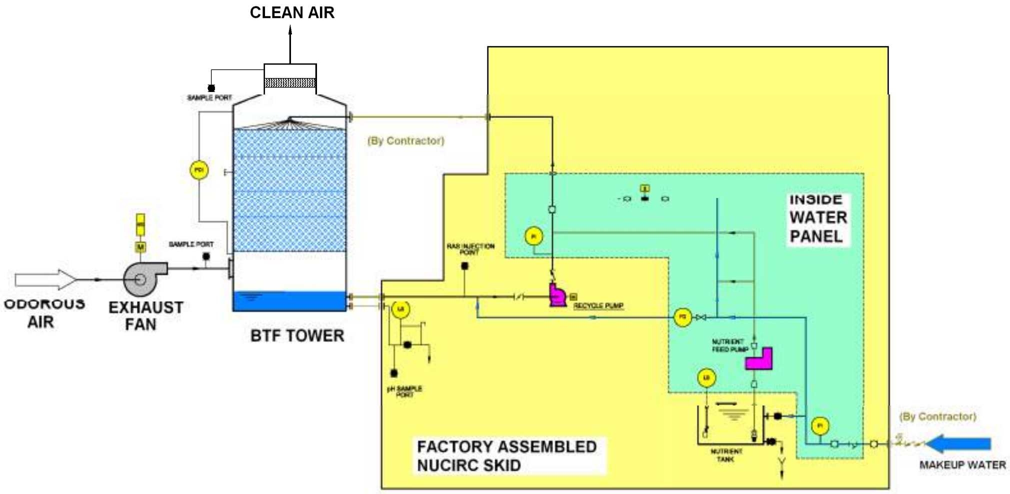
All BTF systems are fabricated from premium vinyl ester FRP with resin rich interior corrosion liner and exterior UV resistant gel coat. A factory-assembled Nucirc skid is available for improved reliability and ease of installation.

SINGLE STAGE AND 2-STAGE DESIGNS

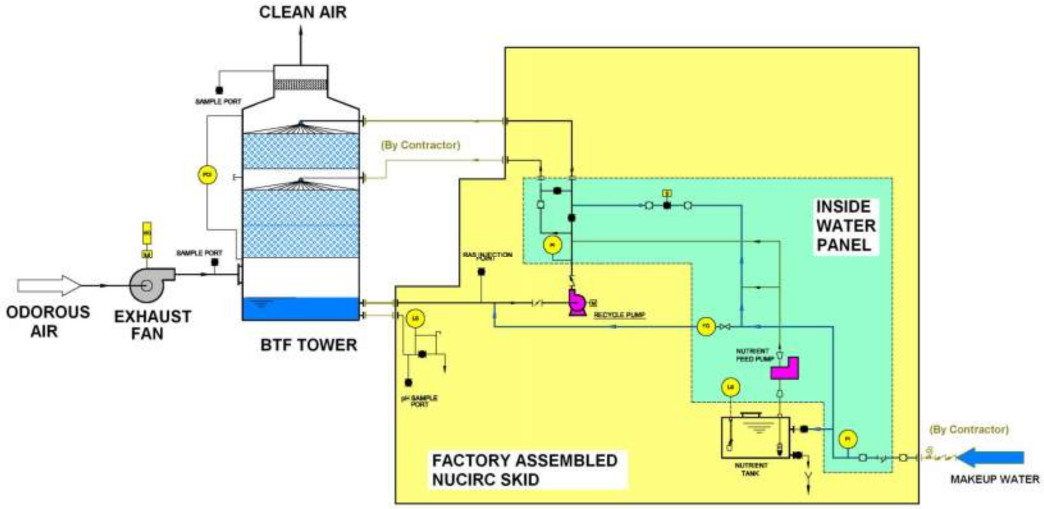
The BTF may be configured as either a single stage or 2-stage bioscrubber. In the single stage BTF the irrigation water is recirculated continuously over the entire media bed. This is the normal mode of operation for system acclimation, and the preferred mode for very high H2S concentrations. After acclimation the single stage BTF may also be operated with intermittent fresh water irrigation.

In the 2-stage BTF the first stage uses continuous recirculation and the second stage uses intermittent irrigation of fresh water. The 2-stage BTF process provides superior control of organic odors.

PROCESS FLOW DIAGRAM: Single Stage



PROCESS FLOW DIAGRAM: Two-Stage



EVOQUA
WATER TECHNOLOGIES

BULK ACTIVATED CARBON ADSORBER ODOR CONTROL SYSTEMS

Evoqua Water Technologies offers a full range of activated carbon systems for municipal and industrial odor control.

Single Bed Systems

Single bed systems are offered to treat up to 8,000 cfm (13,600 m^3/h) of odorous air. Air flow may be vertically upwards or vertically downwards. Systems may be designed to operate under vacuum or forced draft.

Dual Bed Systems

Dual bed systems are designed to provide double the treatment capacity in the same footprint as in the single bed systems. Air enters at the center of the vessel. Half the air passes vertically upward through the upper bed and half down through the lower bed. Exhaust stacks may be internal or external.

High Flow V-Bank Systems

The V-bank uses horizontal flow through two vertical beds and are ideally suited for projects where height constraint, or high air flows are required. The systems have been built to treat up to 60,000 cfm (100,000 m^3/h) in a single vessel.

Bulk activated carbon odor control systems are manufactured from premium vinyl ester FRP for optimum strength and corrosion resistance.

Optional Features

An acoustic enclosure is offered as an option to reduce noise levels in residential locations. The Evoqua RJMC Series

Adsorbers are offered in premium vinyl ester FRP for optimum corrosion resistance. Systems are designed to hold a wide range of activated carbon media. Systems are normally sized to provide a minimum of one year media life.

A grease filter/mist eliminator is recommended upstream of the fan to reduce the maintenance and extend the carbon life.

Standard Features

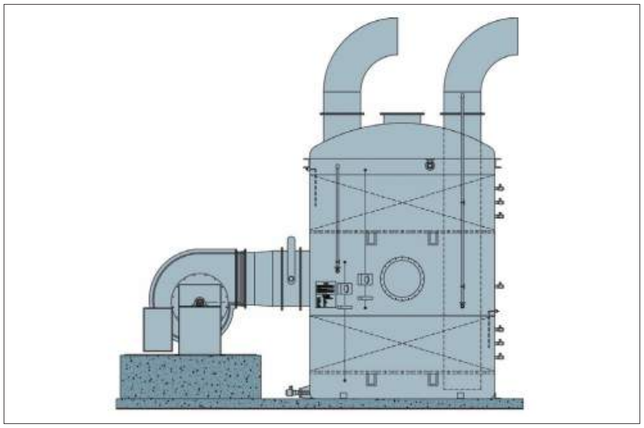
- Air flow rates up to 20,000 cfm in a single unit
- Single or dual-bed systems
- High performance carbon media
- High Volume V-bank designs available

Carbon Adsorbers used as polishing units following a Biotrickling filter.

RJC DESIGN INFORMATION

Model	Airflow Rate	Type	Diameter	Footprint Dimensions L x W x H*	Inlet Connection O.D.	Carbon Wt**	Operating Wt	Fan Motor	Power Supply
Unit	cfm	No. of carbon beds	ft	ft	inches	lbs	lbs	HP	FLA at 460V/3Ph/60Hz
	m^3/hr		*mm*	*mm*	*mm*	*kgs*	*kgs*	*kW*	
RJC-0600	2000	Single	6.0	11 x 7.0 x 7.75	16 3/8	2,500	4,800	5.0	7.5
	3400		*1829*	*3352 x 2134 x 2362*	*416*	*1,136*	*2,182*	*3.7*	
RJC-0800	3500	Single	8.0	14 x 9.0 x 8.5	16 3/8	4,500	8,400	7.5	10.1
	5950		*2438*	*4277 x 2743 x 2565*	*416*	*2,045*	*3,818*	*5.5*	
RJC-1000	5500	Single	10.0	16.5 x 11 x 9.5	19 3/8	7,000	13,000	10	13.5
	9350		*3048*	*5030 x 3353 x 2870*	*492*	*3,182*	*5,909*	*7.5*	
RJC-1200	8000	Single	12.0	18.75 x 13 x 10.25	23 3/4	10,200	19,000	15.0	19.1
	13600		*3658*	*5715 x 3962 x 3124*	*603*	*4,636*	*8,636*	*11*	
RJC-1000D	11000	Double	10.0	17.75 x 11 x 16	25 3/4	14,100	23,000	20	25.2
	18700		*3048*	*5410 x 3353 x 4852*	*654*	*6,409*	*10,455*	*15*	
RJC-1100D	13000	Double	11.0	19.5 x 12 x 16.75	28 5/8	17,100	28,000	25.0	31.1
	22100		*3353*	*5944 x 3658 x 5105*	*721*	*7,773*	*12,727*	*18.5*	
RJC-1200D	16000	Double	12.0	20.5 x 13 x 17	31 1/16	20,300	33,000	25.0	31.1
	27200		*3658*	*6250 x 3962 x 5182*	*789*	*9,227*	*15,000*	*18.5*	
RJC-1400D	20000	Double	14.0	23.25 x 15 x 18.3	34 1/16	27,600	45,000	40.0	49.8
	34000		*4267*	*7087 x 4572 x 5589*	*865*	*12,545*	*20,455*	*30.0*	

* Height to vessel top, excluding stack | ** Dependent upon media type, values are +/- 7%



Media

Evoqua carbon odor control systems are designed to work with a wide range of media.

Midas® OCM

For H_2S odor removal we recommend Midas® Odor Control Media. Midas OCM has the highest odor removal capacity of any media on the market (0.30 g H_2S/cc carbon) and will reduce the frequency of media changeout.

Other Media offered:

- VoCarb® UOCH-KP Caustic impregnated odor control media
- VoCarb® P60 pelletized, coal-based, virgin activated VOC carbon
- VoCarb® 48C, 36C granular, coconut shell activated carbon
- 48C granular, coconut shell activated carbon

Email odorcontrol@evoqua.com or visit www.evoqua.com/bulk to connect with an expert.

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WATER TECHNOLOGIES

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WESTATES® COCONUT SHELL BASED GRANULAR ACTIVATED CARBON - VOCARB® 36C CARBON

FOR GAS PHASE ADSORPTION APPLICATIONS

Description

VOCarb® 36C is a high activity, granular activated carbon that is manufactured from selected grades of coconut shell. The granular shape of this carbon maximizes its geometric surface area, significantly increasing surface and pore diffusion rates and thereby increasing it's effectiveness for the adsorption of VOCs with a short contact time. The very high surface area and predominately microporous pore size distribution further enhance the effectiveness of this coconut shell based carbon. In addition, VOCarb carbons also have a high retentivity to hold onto and prevent desorption of previously adsorbed organic compounds. The granular shape of VOCarb 36C results in excellent gas contacting but still allows the carbon bed to operate at pressure drops similar to 4mm pelletized carbons. The high density and superior hardness of VOCarb 36C activated carbon provides excellent resistance to dust and fines formation.

Applications

Cost effective VOCarb activated carbons developed by Evoqua have been demonstrated to provide superior performance in an extensive array of gas phase treatment applications. VOCarb activated carbons are available for:

- Chemical process applications
- VOC control from air strippers, soil vapor extraction and air sparge systems
- Control of tank vent emissions
- HVAC
- Odor control
- Solvent recovery of low boiling point solvents
- Use as a catalyst/catalyst support

Quality Control

All VOCarb® activated carbons are extensively quality checked at our State of California certified environmental and carbon testing laboratory located in Los Angeles, CA. Evoqua's laboratory is fully equipped to provide complete quality control analyses using ASTM standard test methods in order to assure the consistent quality of all Westates® carbons.

Our technical staff offers hands-on guidance in selecting the most appropriate system, operating conditions and carbon to meet your needs. For more information, contact your nearest Evoqua representative.

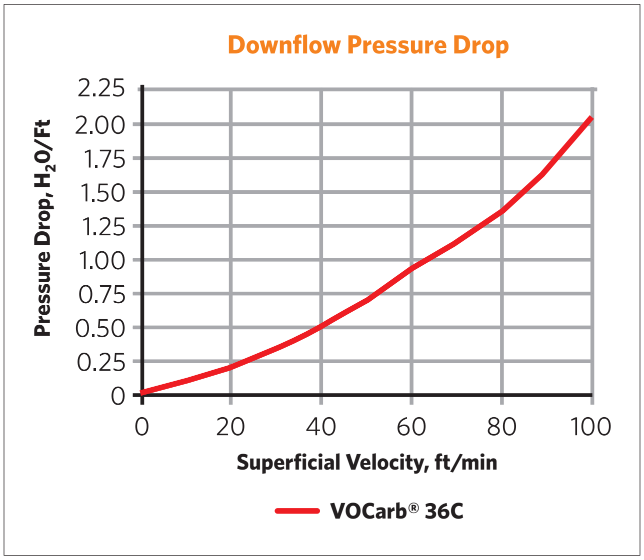
Features and Benefits

- Exceptionally high VOC adsorption capacity
- Excellent VOC retentivity characteristics, works well for the adsorption of small molecules
- Superior hardness minimizes attrition losses during handling, use and service
- Cost effective
- Easily reactivated for recycle and reuse
- Low pressure drop characteristics (similar to 4mm pelletized carbons)
- Backed by technical support and a strong QA/QC program

TYPICAL PROPERTIES

Parameter	VOCarb® 36C
Carbon Type	Coconut Shell
Mesh Size, U.S. Sieve	3 x 6
Butane Activity 1	23.5
Hardness No., Wt. %	98
Moisture Content, Wt. %	3
Apparent Density, g/cc	0.45 - 0.51
CTC Activity 1	60

[1] Butane activity (D5742) has been adopted by ASTM as a replacement for CTC activity (D3467) as a test method for estimating the micropore volume of an activated carbon.



Warning

The adsorption of organic compounds onto activated carbon generates heat. In rare instances, adsorbed compounds may also react on the carbon surface to generate additional heat. If these heat sources are not properly dissipated, the carbon bed temperature may rise to the point where the carbon can ignite, leading to a fire or other hazardous condition. A description of industry-accepted engineering practices to assure the dissipation of heat and safe operation of the carbon bed can be provided upon request. In certain applications where the risk of ignition is significant, activated carbon may not be a recommended treatment technology. Please contact your Technical Sales Representative for more details.

Wet activated carbon readily adsorbs atmospheric oxygen. Dangerously low oxygen levels may exist in closed vessels or poorly ventilated storage areas. Workers should follow all applicable state and federal safety guidelines for entering oxygen depleted areas.

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WATER TECHNOLOGIES

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EVOQUA
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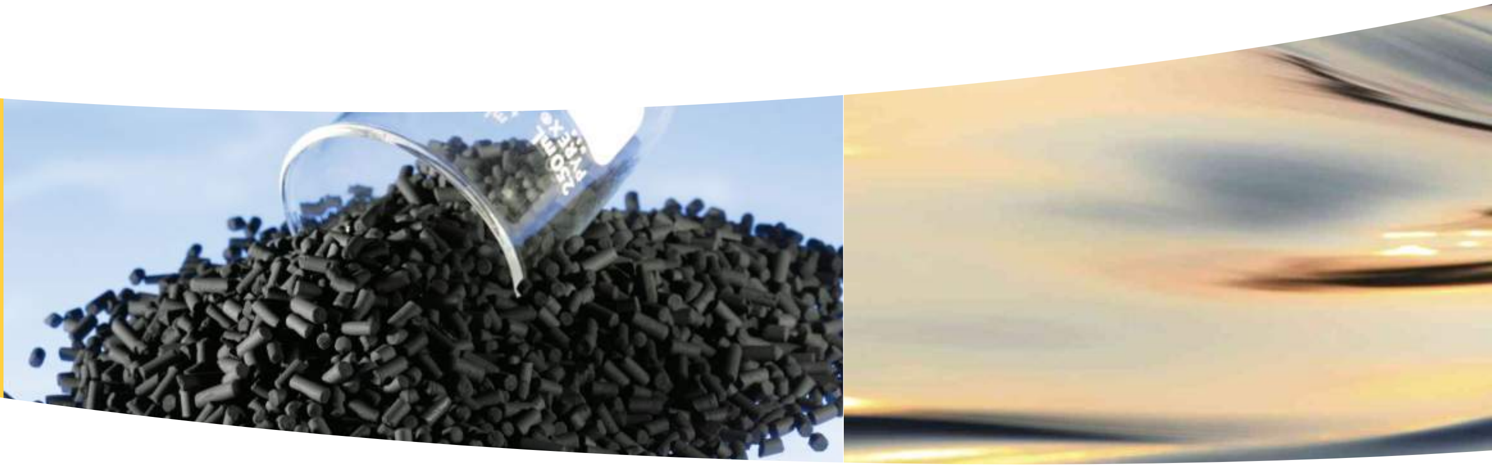


MIDAS® ODOR CONTROL MEDIA (OCM)

Description

Midas® OCM is unlike any other odor control media that is available in the marketplace today. A special manufacturing process which combines selected active ingredients and premium quality bituminous coal gives Midas OCM an extraordinarily high H_2S breakthrough capacity. This odor control media is not impregnated and therefore does not suffer the serious drawbacks associated with alkali-impregnated carbons. Midas OCM has an ignition temperature that is similar to virgin coal-based carbons (>450°C) and since it is not impregnated with a strong alkali, is much safer to load, start-up and remove from an adsorber system.

Midas OCM is a high surface area macroporous media with a large pore volume. The lack of an impregnant means all of Midas OCM's pore volume and surface area are available for storing the sulfur produced during the catalytic oxidation of H_2S and for the adsorption of any volatile organic compounds (VOCs) that may be present in the gas stream. The high H_2S and acidic gas loading capacity of Midas OCM is not affected by the presence of high CO_2 levels. The 4mm pellet diameter offers a low pressure drop to gas flows and a superior hardness offers excellent resistance to dust and fines formation.

APPLICATIONS

Midas® OCM can be successfully used in any application where impregnated or other odor control carbons are currently used including:

- Sewage treatment plants
- Refineries and pulp and paper mills
- Odor Control
- Removal of acidic gases such as HCl and SO_2
- VOC removal

FEATURES AND BENEFITS:

- Exceptionally high H_2S loading capacity
- Longer bed life means fewer service interruptions, lower O&M costs
- High ignition temperature
- Not impregnated, safe to handle (non-corrosive)
- No dangerous pH problem when spent (non-corrosive)
- Low pressure drop
- Backed by technical support and strong QA/QC program

QUALITY CONTROL

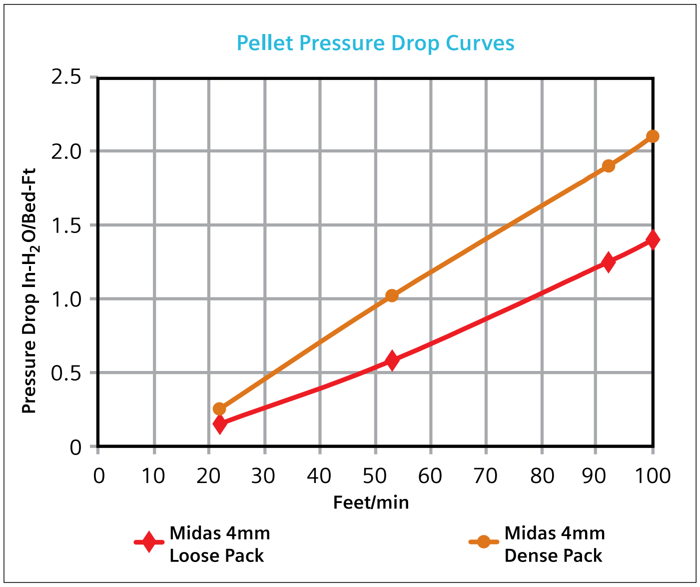
All Midas OCM undergoes extensive quality control at our State certified environmental and carbon testing laboratory located in Los Angeles, CA. The Evoqua laboratory is fully equipped to provide complete quality control analyses using ASTM standard test methods in order to assure the consistent quality of all Midas OCM carbon.

Our technical staff offers hands-on guidance in selecting the most appropriate system, operating conditions and carbon to meet your needs. For more information, contact your nearest representative.

MIDAS® OCM SPECIFICATIONS

Carbon Type	Bituminous Coal
Mean Pellet Diameter, mm	3.9 - 4.1
Apparent Density, g/cc	0.43-0.46
Hardness No.	95 min
Butane Activity	26 min
H_2S Capacity, gH_2S/cc**	0.30 min

** The H_2S breakthrough capacity is determined using ASTM standard method D6646-01. Testing is accomplished by passing a moist (85% RH) stream of air containing 1 vol. % H_2S and the selected concentration of CO_2 through a 1 inch inner diameter tube with a nine-inch deep bed of closely packed carbon at a rate of 1,450 cc/min and monitoring to a 50 ppmv H_2S breakthrough. The results are reported as grams of H_2S adsorbed per cc of carbon.



Safety Note: Unlike impregnated carbons used in odor control applications, Midas® OCM does not need to undergo long term conditioning prior to being put into service. The adsorption of VOCs and the conversion of H_2S to elemental sulfur will lead to the generation of heat within a media bed. Like any carbon bed, this heat of reaction and adsorption needs to be dissipated in order to fully assure the safe operation of the bed. If these heat sources are not properly dissipated, the carbon bed temperature may rise to the point where the carbon can ignite, leading to a fire or other hazardous condition. A description of industry-accepted engineering practices to assure the dissipation of heat and safe operation of the carbon bed can be provided upon request. Wet Midas OCM readily adsorbs atmospheric oxygen. Dangerously low oxygen levels may exist in closed vessels or poorly ventilated storage areas. Workers should follow all applicable state and federal safety guidelines for entering oxygen depleted areas.

To be effective, Midas OCM requires that oxygen and moisture be present in the vapor stream being treated. The minimum acceptable oxygen concentration is 0.5 vol% and should be at least 10 times the combined concentration of H_2S and other reduced sulfur compounds. Optimum performance can be obtained when the relative humidity of the gas being treated always ranges between 60 and 95%. Pre-humidification of Midas OCM immediately prior to it being placed into service assures full performance from initial system startup.

Midas OCM should NOT be used in applications where water condensation (free water) occurs. For example, this includes high humidity applications where temperature fluctuations cause the vapor temperature to drop below its dew point, causing water to condense in the carbon bed. The exposure of Midas OCM to condensed water can adversely effect performance.

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ATTACHMENT F

AREA WATER WELLS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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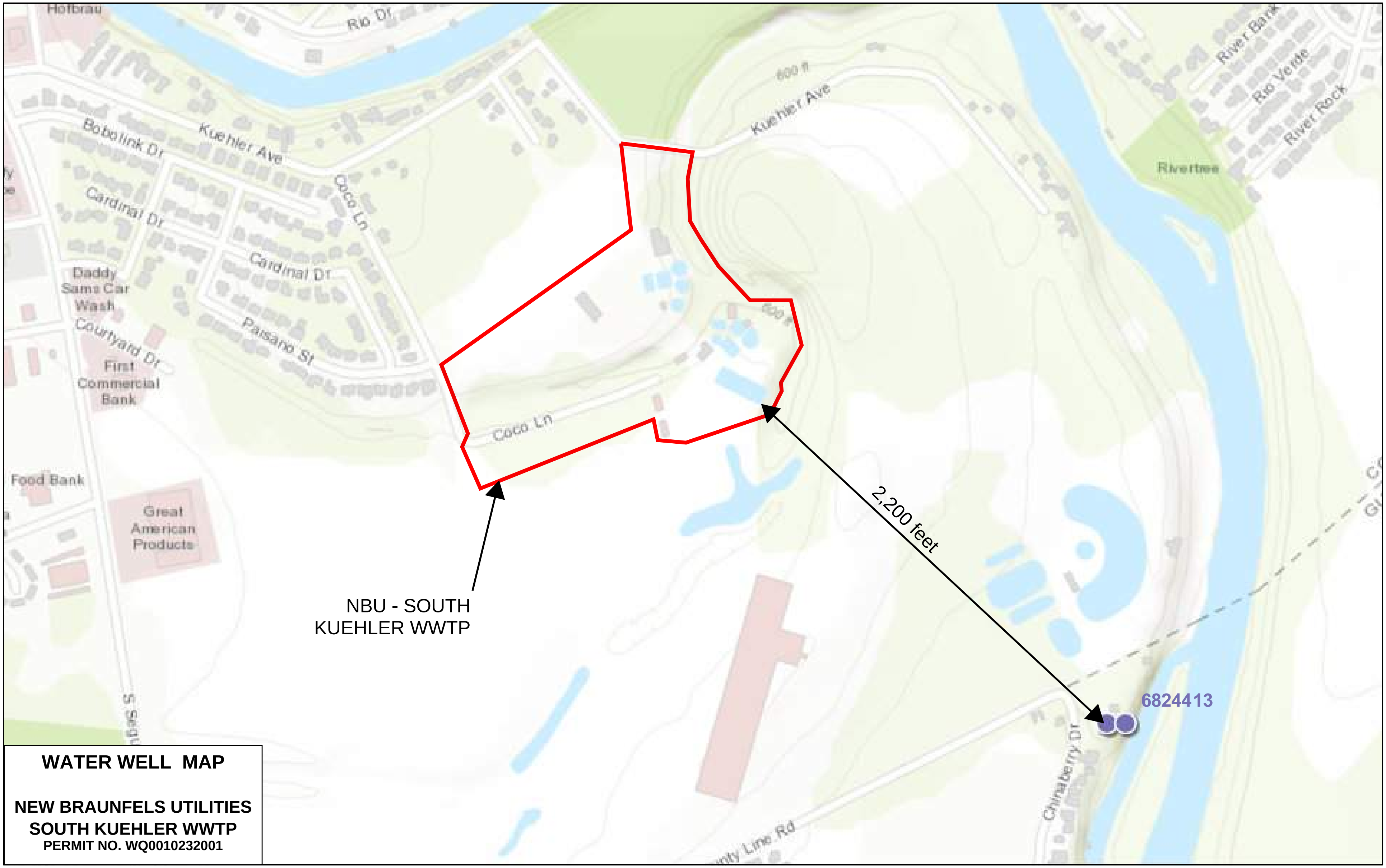
Groundwater Data, Texas



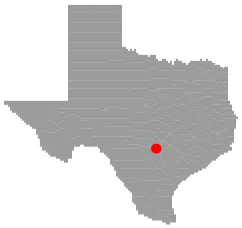
WATER WELL MAP

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WWTP
PERMIT NO. WQ0010232001

Texas Water Development Board

June 6, 2019

● TWDB Groundwater



0 0.075 0.15 0.3 mi
0 0.1 0.2 0.4 km
1:9,028

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

TEXAS WATER DEVELOPMENT BOARD

ATTACHMENT G

WETLANDS MAP

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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LEGEND

CONUS Wetlands

- ■ Estuarine and Marine Deepwater
- ■ Estuarine and Marine Wetland
- ■ Freshwater Emergent Wetland
- ■ Freshwater Forested/Shrub Wetland
- ■ Freshwater Pond
- ■ Lake
- ■ Other
- ■ Riverine

WETLANDS MAP

NEW BRAUNFELS UTILITIES SOUTH KUEHLER WWTP

PERMIT NO. WQ0010232001

JONES CARTER

Notes

This product is offered for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property, governmental and/or political boundaries or related facilities to said boundary. No express warranties are made by Jones & Carter, Inc. concerning the accuracy, completeness, reliability, or usability of the information included within this exhibit. This map was automatically generated using Geocortex Essentials.

ATTACHMENT H

SUPPLEMENTAL TECHNICAL REPORTS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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SUPPLEMENTAL TECHNICAL REPORT

DOMESTIC WASTEWATER PERMIT MAJOR AMENDMENT

for

NEW BRAUNFELS UTILITIES

SOUTH KUEHLER WASTEWATER TREATMENT PLANT

COMAL COUNTY, TEXAS

Drew Crow
07/09/19

C. DREW CROW
108539

JULY 2019
JC Job No. 05487-0005-00

JONES | CARTER
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I. INTRODUCTION

The purpose of this report is to provide additional information pertaining to items in the Domestic Administrative Report and the Domestic Technical Report for the major amendment application to the New Braunfels Utilities South Kuehler Wastewater Treatment Plant (WWTP). The permit includes the existing operational Phase of 4.2 MGD and the future phases of 9.3 MGD and 15.4 MGD.

The current and future facilities are located at 1608 Coco Drive, New Braunfels, Texas 78130.

II. LOCATION INFORMATION

Please see Item 7 of the Domestic Administrative Report 1.0 for specific location information. A USGS Map with the required site information in the Attachments section of this application.

III. TREATMENT UNITS

(For Item 3 of Technical Report 1.0)

The current facility is sized to treat 4.2 MGD. Future facilities will be constructed in two operational phases with total design flows as described in Section I. A detailed description of the treatment process for each phase is presented below:

The existing phase of the facility is a permanent concrete plant designed and constructed to treat the plant capacity of 4.20 MGD. It operates as a suspended growth activated sludge process with a single-stage nitrification mode. Phosphorous is removed using alum added upstream of the secondary clarifiers. The existing treatment units include a screening structure with mechanical screens, an aerated grit chamber, aeration basins, secondary clarifiers, chlorine contact basins, a dechlorination basin, a flow measurement basin, aerobic digesters, gravity thickener, submerged membrane thickening basins, and a belt press dewatering facility. In this phase, raw sewage enters the screening structure from the gravity collection system and offsite lift station. Screened flow then enters the aerated grit chambers, where fine grit is separated and removed. Then flow enters a rapid mix basin immediately upstream of the aeration basin where it is mixed with return activated sludge to create mixed liquor and flows through the aeration basins which will be operated in a single-stage nitrification mode to consume organics and breakdown ammonia. From the aeration basins, the mixed liquor flows to the clarifier loading basin where alum is added to precipitate phosphorous, and then it flows into the secondary clarifier for clarification. After clarification, the treated effluent flows to the chlorine contact basin for disinfection, then to the dechlorination basin for dechlorination. From there, the effluent flows over a v-notch weir for flow measurement and to the outfall and receiving stream. Sludge that is removed from the secondary clarifiers is transported by air lifts to the gravity thickener, where it then flows to the submerged membrane thickener basins where permeate is removed through the membrane with pumps. Sludge then flows to the aerobic digesters where volatile organics are reduced to stabilize the sludge. Digested sludge is then pumped to belt presses where the sludge is dewatered before being hauled offsite.

The proposed Phase II facility will include the portions of the existing treatment facilities for the South Kuehler WWTP as well as portions of the existing North Kuehler WWTP. As described elsewhere in this major amendment application, the existing North Kuehler WWTP will become part of the expanded South Kuehler WWTP. The existing screening structure and aerated grit chamber at both the North

Kuehler WWTP and South Kuehler WWTP will be decommissioned and demolished. The existing chlorine contact basin at both the North Kuehler WWTP and South Kuehler WWTP will be converted into a pump station that sends flow to the new common tertiary treatment unit. New process units will include a screening structure with a mechanical screens, aerated grit chambers, submersible lift station, elevated flow splitter, anaerobic basin, anoxic basin, aeration basin, secondary clarifier, tertiary intermittently backwashed granular dual media filters, ultraviolet disinfection basin, post aeration basin, flow measurement basin, aerobic digesters, and positive displacement blowers. The existing belt press dewatering facility will also be expanded.

In this phase, raw sewage will enter the new common screening structure from the gravity collection system and offsite lift station. Screened flow will then enter the aerated grit chambers, where fine grit is separated and removed. Then flow will enter a submersible lift station where it will be pumped to an elevated flow splitter. The elevated flow splitter will split flow proportionately to the three parallel secondary treatment trains. The secondary trains at the existing South Kuehler WWTP and North Kuehler WWTP will operate with the same process as described above under the existing phase. The proposed secondary treatment train to be constructed in Phase II will consist of an anaerobic basin, anoxic basin, aeration basin, and secondary clarifier operating as a biological nutrient removal, conventional activated sludge process with single stage nitrification. Phosphorous will be removed with a biological nutrient removal process with alum addition as a secondary treatment method. Nitrogen removal is limited to treatment of the return activated sludge side stream. The intent of the partial nitrogen removal is only to help promote the biological phosphorous removal process by reducing the amount of nitrates in the process. The anoxic basin and nitrogen removal is not required for TPDES discharge permit compliance. Return activated sludge will be air lifted into a rapid mix basin where it will mix with a portion of the influent flow and then flow through the anoxic basin to breakdown nitrates by consuming oxygen and off gassing nitrogen. Flow will then enter the anaerobic basin where it will mix with the remainder of the influent flow to create mixed liquor. In the anaerobic basin, phosphorous will be released by PAOs prior to flowing into the aeration basin where phosphorous will PAOs will absorb phosphorous in larger quantities than it originally stored. The aeration basin will be operated in a single-stage nitrification mode to consume organics and breakdown ammonia. From the aeration basins, the mixed liquor flows to the clarifier loading basin where alum will be added as a secondary means to coagulate phosphorous not absorbed in the process, and then it flows into secondary clarifier for clarification. After clarification, flow from all three parallel secondary treatment trains will flow to the tertiary intermittently backwashed granular dual media filters. Filtered effluent will then flow through an ultraviolet (UV) disinfection basin. From there, the effluent flows through a Parshall flume for flow measurement, through a post aeration basin for oxygen addition, and to the outfall and receiving stream. Sludge that is removed from the secondary clarifiers at each of the two exiting treatment units is transported with air lifts to the gravity thickener, where it then flows to the submerged membrane thickener basins where permeate is removed through the membrane with pumps, and then flows to the aerobic digesters where volatile organics are reduced to stabilize the sludge. Sludge that is removed from the secondary clarifier at the new treatment unit pumped to the submerged membrane thickener basins where permeate is removed through the membrane with pumps, and then flows to the aerobic digesters where volatile organics are reduced to stabilize the sludge. Thickened sludge from all digesters is then pumped to a new digester basin for further digestion where is combined with the sludge from all three secondary treatment units before being pumped to belt presses where the sludge is dewatered before being hauled offsite.

The proposed Phase III facility will include all of the treatment units of the Phase II facility. The existing screening structure will house a new additional screen, the existing lift station will house new pumps, the existing UV disinfection basin will house new additional UV modules, and the existing house a new additional belt press. New process units include anaerobic basins, anoxic basins, aeration basins, secondary clarifiers, tertiary dual media filters, aerobic digesters, and positive displacement blowers.

In this phase, raw sewage will enter the new common screening structure from the gravity collection system and offsite lift station. Screened flow will then enter the aerated grit chambers, where fine grit is separated and removed. Then flow will enter a submersible lift station where it will be pumped to an elevated flow splitter. The elevated flow splitter will split flow proportionately to the four parallel secondary treatment trains. The secondary trains at the existing South Kuehler WWTP and North Kuehler WWTP will operate with the same process as described above under the existing phase. The proposed secondary treatment trains added in Phase II and Phase III will be identical and will consist of anaerobic basins, anoxic basins, aeration basins, and secondary clarifiers operating as a biological nutrient removal, conventional activated sludge process with single stage nitrification. Phosphorous will be removed with a biological nutrient removal process with alum addition as a secondary treatment method. Nitrogen removal is limited to treatment of the return activated sludge side stream. The intent of the partial nitrogen removal is only to help promote the biological phosphorous removal process by reducing the amount of nitrates in the process. The anoxic basin and nitrogen removal is not required for TPDES discharge permit compliance. Return activated sludge will be air lifted into a rapid mix basin where it will mix with a portion of the influent flow and then flow through anoxic basins to breakdown nitrates by consuming oxygen and off gassing nitrogen. Flow will then enter anaerobic basins where it will mix with the remainder of the influent flow to create mixed liquor. In the anaerobic basins, phosphorous will be released by PAOs prior to flowing into aeration basins where phosphorous will PAOs will absorb phosphorous in larger quantities than it originally stored. The aeration basins will be operated in a single-stage nitrification mode to consume organics and breakdown ammonia. From the aeration basins, the mixed liquor flows to the clarifier loading basins where alum will be added as a secondary means to coagulate phosphorous not absorbed in the process, and then it flows into secondary clarifiers for clarification. After clarification, flow from all four parallel secondary treatment trains will flow to the tertiary intermittently backwashed granular dual media filters. Filtered effluent will then flow through a UV disinfection basin. From there, the effluent flows through a Parshall flume for flow measurement, through a post aeration basin for oxygen addition, and to the outfall and receiving stream. Sludge that is removed from the secondary clarifiers at each of the two exiting treatment units is transported by air lifts to the gravity thickener, where it then flows to the submerged membrane thickener basins where permeate is removed through the membrane with pumps, and then flows to the aerobic digesters where volatile organics are reduced to stabilize the sludge. Sludge that is removed from the secondary clarifier at the new treatment unit pumped to the submerged membrane thickener basins where permeate is removed through the membrane with pumps, and then flows to the aerobic digesters where volatile organics are reduced to stabilize the sludge. Thickened sludge from all digesters is then pumped to a new digester basin for further digestion where is combined with the sludge from all three secondary treatment units before being pumped to belt presses where the sludge is dewatered before being hauled offsite.

IV. DESIGN CALCULATIONS AND FEATURES

(For Item 3b of Technical Report 1.0 & Item 4 of Technical Report 1.1)

Design calculations are provided as part of this report on the following pages for both future phases of construction.

The current facilities and all future expansions will be equipped with design features to prevent overflows or bypassing of untreated wastewater. These features include the following:

- Redundant electrical power supply. Power can be provided from two different sub stations, which will be capable of being served from two different power sources
- All process and equipment alarms for items such as equipment failures, high levels, etc. will be

automatically sent to NBU's SCADA system where it will notify the Operator 24/7.

- Standby equipment will be provided at all major treatment units and pump stations to ensure operation in the event of equipment being out of service for repair or maintenance (i.e. standby pump in the lift station, standby blower at each blower bank, standby screen at the influent, redundant channel of UV modules for disinfection, etc.) to prevent overflows and/or bypass of untreated wastewater.
- High level alarms are included in the lift station, clarified effluent transfer pump stations, aerobic digesters to notify the Operator to prevent overflows

PHASE II – 9.3 MGD

I. SCOPE

The proposed Phase II facility will be a permanent concrete plant with suspended growth activated sludge process with biological nutrient removal and single stage nitrification. The facility will include portions of existing treatment units at the existing North Kuehler Wastewater Treatment Plant (WWTP), portions of existing treatment units at the existing South Kuehler WWTP, and new process treatment units. The existing screening structure and aerated grit chamber and both the North Kuehler WWTP and South Kuehler WWTP will be decommissioned and demolished. The existing chlorine contact basin at both the North Kuehler WWTP and South Kuehler WWTP will be converted into a pump station that sends flow to the new tertiary treatment unit. New process units include a screening structure with a mechanical screens, aerated grit chambers, submersible lift station, elevated flow splitter, anaerobic basin, anoxic basin, aeration basin, secondary clarifier, tertiary dual media filters, ultraviolet disinfection basin, post aeration basin, aerobic digesters, and positive displacement blowers. The existing belt press dewatering facility will also be expanded.

II. WASTEWATER TREATMENT PLANT DESIGN

A. DESIGN CRITERIA

1. Daily Effluent Limits

a. BOD_5 = 10 mg/L

b. TSS = 15 mg/L

a. NH_3-N = 3 mg/L

b. Total Phosphorus = 1 mg/L

c. DO = 4 mg/L

f. *E Coli* = 126 number colonies/100 mL

2. Process Criteria

The criteria used for the constructed aeration basins was based on TCEQ Chapter 217 criteria and more conservative measures requested by the client.

a. Minimum Hydraulic Detention Time for Aerated Grit Chamber (minutes) = 3.0

b. Maximum Aeration Basin Organic Loading (lbs BOD_5/day/1,000 ft^3) = 35

c. Maximum Clarifier Surface Loading at Peak Flow (gal/day/ft^2) = 1,200

d. Minimum Clarifier Detention Time (hours) = 1.8

e. Maximum Clarifier Weir Loading at Peak Flow (gal/day/ft) = 30,000

f. Maximum Dual Media Filter Flux Rate at Peak Flow (gal/min/ft^2) = 4

g. Maximum Filtration Rate at Peak Flow w/ One Filter Out of Service (gal/min/ft^2) = 5

h. Minimum Solids Retention Time in Aerobic Digester* (days) = 28*

i. Minimum Air Required for Digester (scfm/1,000 ft^3) = 30

j. Minimum Oxygen Required for Aeration Basins (lbs O_2/1 lb BOD_5) = 2.2

*28-day SRT utilized instead of a 40-day SRT for use of a multi-stage digester per EPA publication "Control of Pathogens and Vector Attraction in Sewage Sludge."

B. TREATMENT FACILITIES

1. Flow

a. Average (Design) = 1.0Q = 9,300,000 gpd = 6,458 gpm

b. Peak (2-hour) = 3.0Q = 27,900,000 gpd = 19,375 gpm

2. Influent Composition

The following influent wastewater compositions are based on composite samples collected at the existing headworks over a 1 year period. The design values for BOD_5, TSS, and NH_3-N are calculated by adding one (1) standard deviation to the average.

a. BOD_5 = 310 mg/L

b. TSS = 350 mg/L

c. NH_3-N = 50 mg/L

d. TP = 8 mg/L

3. Organic Loadings

   a. BOD$_5$ = (9.30 MGD)(8.34)(310 mg/L) = 24,044 lbs BOD$_5$/day

   b. TSS = (9.30 MGD)(8.34)(350 mg/L) = 27,147 lbs TSS/day

   c. NH$_3$-N = (9.30 MGD)(8.34)(50 mg/L) = 3,878 lbs NH$_3$-N/day

   d. Total P = (9.30 MGD)(8.34)(8 mg/L) = 620 lbs P/day

4. Process Basins and Equipment

   a. Screening. Two mechanical screens will be installed in this phase, each with a minimum hydraulic capacity of 27.9 MGD, the design peak flow of the facility. A manual screen will also be provided for redundancy and will have a minimum hydraulic capacity of 27.9 MGD. The screening channels will be covered, equipment enclosed, and connected to an odor control system.

   b. Grit Chamber. Two parallel aerated grit chambers will be installed in this phase. The grit chambers will be covered and connected to an odor control system.

      i. Required Volume at Peak Flow
      (19,375 gpm)(3 min)/(7.48gal/ft^3) = 7,771 ft^3

      ii. Proposed Volume
      2[(27 ft)^2(8.03 ft)+((27 ft)^2 (12.5 ft)/3)] = 17,783 ft^3

      iii. Actual Detention Time at Peak Flow
      (17,783 ft^3)(7.48)/(19,375 gpm) = 6.9 minutes

   c. Lift Station. A submersible lift station with four pumps, three duty and one standby, will be installed with a minimum firm hydraulic pumping capacity of 27.9 MGD, the design peak flow of the facility. The lift station will be covered and connected to an odor control system.

   d. Elevated Flow Splitter. All flow is pumped from the lift station to an elevated flow splitter, which uses weirs to proportionately send flow to three secondary treatment plants based on the following splits.

      i. Plant No. 1 (Existing North Kuehler) – 3.10 MGD

      ii. Plant No. 2 (Existing South Kuehler) – 4.10 MGD

      iii. Plant No. 3 – 2.10 MGD

   e. Secondary Treatment.

   Plant No. 1 (Existing North Kuehler) – 3.10 MGD This secondary treatment train consists of aeration basins and secondary clarifiers operating as a conventional activated sludge process with single stage nitrification. Phosphorous is removed using alum added upstream of the clarifiers. Alum addition for chemical phosphorous removal exists today and was previously approved by TCEQ. This process will be retained.

Aeration Basins

i. Required Volume Using Traditional Design Method
(3.10 MGD)(8.34)(310 mg/L)/(35 lbs BOD$_5$/1000 ft^3) = 228,993 ft^3

ii. Existing Volume
(6,345 ft^3) + (116,333 ft^3) + (103,846 ft^3) + (5,171 ft^3) = 231,695 ft^3

iii. Actual Organic Loading
8,015 lb/day/(231,695 ft^3)(1,000 ft^3) = 34.6 lb BOD$_5$/ 1000 ft^3

Secondary Clarifiers

i. Required Surface Area At Peak Flow
(9.3 MGD)(1,000,000 gal/MG)/1200 gal/day/ft^2 = 7,750 ft^2

ii. Existing Surface Area
(2)(5,302 ft^2) = 10,604 ft^2

iii. Existing Surface Loading at Peak Flow
(9,300,000 gpd)/(10,604 ft^2) = 877 gpd/ft^2

iv. Existing Clarifier Side Water Depth = 11.50 ft

v. Existing Hydraulic Detention Time at Peak Flow
(10,604 ft^2)(11.50 ft)(7.48 gal/ft^3)(24 hr/day)/
(1,000,000 gallons/MG)(9.30 MGD) = 2.35 hours

vi. Existing Clarifier Weir Length
(2)(180 ft + 192 ft) = 744 ft

vii. Existing Weir Loading at Peak Flow
(9,300,000 gpd)/(744 ft) = 12,500 gpd/ft

Plant No. 2 (Existing South Kuehler) – 4.10 MGD. This secondary treatment train consists of aeration basins and secondary clarifiers operating as a conventional activated sludge process with single stage nitrification. Phosphorous is removed using alum added upstream of the clarifiers. Alum addition for chemical phosphorous removal exists today and was previously approved by TCEQ. This process will be retained.

Aeration Basins

i. Required Volume Using Traditional Design Method
(4.10 MGD)(8.34)(310 mg/L)/(35 lbs BOD$_5$/1000 ft^3) = 302,861 ft^3

ii. Existing Volume
(9,248 ft^3) + (166,388 ft^3) + (131,203 ft^3) + (5,514 ft^3) = 312,353 ft^3

iii. Actual Organic Loading
10,600 lb/day/(312,353 ft^3)(1,000 ft^3) = 33.9 lb BOD$_5$/ 1000 ft^3

Secondary Clarifiers

i. Required Surface Area At Peak Flow
(12.3 MGD)(1,000,000 gal/MG)/1200 gal/day/ft^2 = 10,250 ft^2

ii. Existing Surface Area
(2)(5,302 ft^2) = 10,604 ft^2

iii. Existing Surface Loading at Peak Flow
(12,300,000 gpd)/(10,604 ft^2) = 1,160 gpd/ft^2

iv. Existing Clarifier Side Water Depth = 11.67 ft

v. Existing Hydraulic Detention Time at Peak Flow
(10,604 ft^2)(11.67 ft)(7.48 gal/ft^3)(24 hr/day)/
(1,000,000 gallons/MG)(12.30 MGD) = 1.81 hours

vi. The proposed clarifier will not utilize traditional weirs and baffles. It will utilize a submerged effluent launder system, which consists of a full perimeter submerged launder with submerged ports sized to control the inlet rate into the submerged launder. This will maintain equal distribution of flow from the center of the clarifier outwards to the launder. The Submerged Effluent Launder system design is a proprietary designed and manufactured by Ovivo USA, LLC.

Plant No. 3 – 2.10 MGD. This secondary treatment train consists of an anaerobic basin, anoxic basin, aeration basin, and secondary clarifier operating as a biological nutrient removal, conventional activated sludge process with single stage nitrification. Phosphorous is removed with the biological nutrient removal process with alum addition as a secondary treatment method. Nitrogen removal is limited to treatment of the return activated sludge side stream. The intent of the partial nitrogen removal is only to help promote the biological phosphorous removal process by reducing the amount of nitrates in the process. The anoxic basin and nitrogen removal is not required for TPDES discharge permit compliance.

Anaerobic Basin

i. Required Volume at Average Daily Flow
(2,100,000 gal/day)(1.5 hr)/(24 hr/day)/(7.48gal/ft^3) = 17,546 ft^3

ii. Proposed Volume
(20 ft)(48 ft)(19 ft) = 18,240 ft^3

iii. Actual Hydraulic Retention Time at Average Daily Flow
(18,240 ft^3)(7.48gal/ft^3)(24 hr/day)/(2,100,000 gal/day) = 1.6 hrs

Aeration Basin

i. Required Volume Using Traditional Design Method
(2.10 MGD)(8.34)(310 mg/L)/(35 lb BOD_5/1000 ft^3) = 155,124 ft^3

ii. Proposed Volume
(20 ft)(82 ft)(120 ft) = 196,800 ft^3

iii. Actual Organic Loading
5,429 lb/day/(196,800 ft^3)(1,000 ft^3) = 27.6 lb BOD_5/

Anoxic Selector Basin for RAS Side Stream

i. Required Volume at Average Daily Flow
(2,520,000 gal/day)(0.5 hr)/(24 hr/day)/(7.48gal/ft^3) = 7,019 ft^3

ii. Proposed Volume
(20 ft)(19 ft)(19 ft) = 7,220 ft^3

iii. Actual Hydraulic Retention Time
(7,220 ft^3)(7.48gal/ft^3)(24 hr/day)/(2,520,000 gal/day) = 0.51 hrs

Secondary Clarifiers

i. Required Surface Area At Peak Flow
(6.3 MGD)(1,000,000 gal/MG)/1200 gal/day/ft^2 = 5,250 ft^2

ii. Proposed Surface Area
$(80\ ft)^2(\pi)/(4)$ = 5,026 ft^2

iii. Proposed Surface Loading at Peak Flow
(6,300,000 gpd)/(5,026 ft^2) = 1,253 gpd/ft^2

The proposed surface loading at peak flow exceed the TCEQ value. A variance will be requested from TCEQ for the proposed clarifier. The slightly increased loading rate at peak flow is acceptable for performance since there are tertiary filters following the clarifiers. By installing an 80 ft diameter clarifier, it allows NBU to match the diameter of all its existing 4 clarifiers, which is beneficial for maintenance and operation of the clarifiers.

iv. Proposed Clarifier Side Water Depth = 13.0 ft

v. Proposed Hydraulic Detention Time at Peak Flow
(5,026 ft^2)(13.0 ft)(7.48 gal/ft^3)(24 hr/day)/
(1,000,000 gallons/MG)(6.30 MGD) = 1.86 hours

vi. The proposed clarifier will not utilize traditional weirs and baffles. It will utilize a submerged effluent launder system, which consists of a full perimeter submerged launder with submerged ports sized to control the inlet rate into the submerged launder. This will maintain equal distribution of flow from the center of the clarifier outwards to the launder. The Submerged Effluent Launder system design is a proprietary designed and manufactured by Ovivo USA, LLC.

f. Tertiary Intermittently Backwashed, Granular Dual Media Filters. Flow from all three parallel secondary treatment trains will flow to the tertiary intermittently backwashed, granular dual media filters. Four parallel filter beds will be installed. Each filter will consist of dual media.

i. Required Surface Area at Peak Flow
(19,375 gpm)/(4 gpm/ ft^2) = 4,844 ft^2

ii. Proposed Surface Area
(4)(16 ft)(84 ft) = 5,376 ft^2

iii. Actual Filtration Rate at Peak Flow
(19,375 gpm)/(5,376 ft^2) = 3.6 gpm/ft^2

iv. Actual Filtration Rate at Peak Flow with One Filter Out of Service
(19,375 gpm)/(4,032 ft^2) = 4.8 gpm/ft^2

g. Ultraviolet Disinfection. Flow will pass through three parallel channels containing ultraviolet (UV) treatment modules. The UV modules will be a low-pressure high-output type and utilizing 254 nm wavelength light with an assumed 65% minimum transmittance and 20 mJ/cm^2 UV dose rate. Two channels will be required to treat the full peak flow of 27.9 MGD, with each channel capable of treatment 13.95 MGD. The third channel will be a redundant 13.95 MGD treatment channel. A minimum UV contact time of 20 seconds will be provided at peak flow, with one channel out of service.

h. Post Aeration. Flow will pass through a post aeration basin that will include coarse bubble aeration to provide oxygen to the wastewater. The air demand is included in the Air Requirements section of this report.

i. Aerobic Digesters. The existing North Kuehler WWTP and South Kuehler WWTP contain aerobic digesters that individually feed the existing belt press dewatering facility. These basins will be retained with new aerobic digester basins added to provide digestion for the additional capacity, as well as provide a longer solids residence time for the existing aerobic digesters. All sludge will flow to a common digester that will feed the existing belt press dewatering facility. The digester sizing assumes one pound of solids produced per pound of BOD_5 applied plus alum sludge from the chemical phosphorous removal, solids are 70% volatile organics, 38% of the volatiles are destroyed during digestion, and the average MLSS concentration in the digesters is 30,000 mg/l.

i. Solids Production
(24,044 lbs BOD_5 /day)(1 lb solids/1 lb BOD_5) = 24,044 lbs solids/day

ii. Digested Solids Production
(24,044 lbs solids/day)(1-(0.38)(0.7)) = 17,648 lbs solids/day

iii. Average Digested Solids Production
(24,044 lbs solids/day + 17,648 lbs solids/day)/2 = 20,846 lbs solids/day

iv. Alum Sludge Production
619 lbs solids/day + 819 lbs solids/day + 114 lbs solids/day = 1,552 lbs solids/day

v. Total Average Solids Production
20,846 lbs solids/day + 1,552 lbs solids/day = 22,398 lbs solids/day

vi. Total Solids in Digester for 28-day SRT*
(22,398 lbs solids/day)(28 days) = 627,144 lbs solids

vii. Required Volume
(627,144 lbs solids)(10^6)/(8.34)/(30,000 mg/l MLSS)/(7.48) = 335,103 ft^3

viii. Existing Volume
43,156 ft^3 + 61,473 ft^3 = 104,629 ft^3

ix. Proposed Volume
(20 ft)(145 ft)(70 ft) + (20 ft)(60 ft)(70 ft) = 287,000 ft^3

x. Total Volume
104,629 ft^3 + 287,000 ft^3 = 391,629 ft^3

xi. Actual Solids Residence Time
(391,629 ft^3)(7.48)(8.34)(30,000 mg/l)/(10^6)/(22,398 lbs/day)=32.7 days

*28-day SRT utilized instead of 40-day SRT for use of a two stage digester per EPA publication "Control of Pathogens and Vector Attraction in Sewage Sludge".

j. Sludge Thickening. The existing aerobic digesters at the North Kuehler WWTP and South Kuehler WWTP contain a combination of gravity thickeners and submerged membranes that are used to thicken sludge. These sludge thickening components will be retained with the expansion. Also, additional submerged membranes will be added with the proposed digester volume to maintain an average MLSS concentration in the digesters of 30,000 mg/l.

k. Sludge Dewatering. All sludge from both the existing North Kuehler WWTP and South Kuehler WWTP is pumped to the exiting belt press sludge dewatering facility. The existing facility will be expanded to accommodate the increased sludge production from the expansion. The belt press sizing assumes operation 8 hours per day and 5 days per week, and a maximum feed rate of 75 gpm/meter and 750 lbs of solids per hour per meter, a sludge feed rate of 30,000 mg/l. In the event a belt press is out of service, the remaining belt presses can be operated for longer durations to maintain sludge processing capabilities.

i. Total Belt Width Required Based on Hydraulic Capacity
(87,766 gal/d)(7/5)/(480 op min/d)/(75 gal/min/m) = 3.4 m belt width

ii. Total Belt Width Required Based on Solids Capacity
(22,398 lbs solids/d)(7/5)/(8 op hr/d)/(750 lbs solids/hr/m) = 5.2 m belt width

iii. Existing Belt Width
(2)(2 meter belt presses) = 4 meters belt width

iv. Proposed Belt Width
(1)(2 meter belt press) = 2 meters belt width

v. Total Belt Width
4 meters + 2 meters = 6 meters belt width

l. Air Requirements. The existing North Kuehler WWTP will be served by two blower banks, one each for process air and solids handling air, with a common spare blower connected with valves and piping. The existing South Kuehler WWTP will be served by two separate blower banks, one each for process air and solids handling air. Each bank will have its own spare blower. The proposed treatment units will be served by two separate blower banks, one each for process air and solids handling air. Each bank will have its own spare blower.

Plant No. 1 (Existing North Kuehler) Process Air

i. Aeration Basin

1. Air Required for Treatment

$$\frac{(1.2)(310 \text{ mg/L } BOD_5) + (4.3)(50 \text{ mg/L } NH_3\text{-N})}{(310 \text{ mg/L } BOD_5)} = 1.9 \text{ lb } O_2/ \text{ lb } BOD_5{}^*$$

*TCEQ Chapter 217.155(a)(3) requires using a minimum of 2.2 lb O_2/lb BOD_5 if the system is intended to nitrify, which is used below for calculations.

2. Coarse Bubble Requirements

$$\frac{(310 \text{ mg/L } BOD_5)(8.34)(3.10 \text{ MGD})(2.2 \text{ lb } O_2/\text{lb } BOD_5)}{(7.7\%)(0.075)(0.23)(1,440)} = 9,218 \text{ scfm}$$

* Wastewater Oxygen Transfer Efficiency is based on the actual efficiency for the installed aeration systems based on the manufacturer provided data

ii. Return Sludge Air Lifts
(4)(110 scfm) = 440 scfm

iii. Clarifier Loading Zones
(5,171 ft^3)(30 scfm/1000 ft^3) = 155 scfm

iv. Total Process Air Requirement = 9,813 scfm

Plant No. 1 (Existing North Kuehler) Solids Air

i. Aerobic Digester
(43,156 ft^3)(30 scfm/1000 ft^3) = 1,295 scfm

ii. Waste Sludge & Sludge Transfer Air Lifts
(2)(40 scfm) + (5)(40 scfm) = 280 scfm

iii. Total Solids Air Requirement = 1,575 scfm

Plant No. 2 (Existing South Kuehler) Process Air

i. Aeration Basin

1. Air Required for Treatment

$$\frac{(1.2)(310\text{ mg/L BOD}_5) + (4.3)(50\text{ mg/L NH}_3\text{-N})}{(310\text{ mg/L BOD}_5)} = 1.9\text{ lb O}_2/\text{ lb BOD}_5{*}$$

*TCEQ Chapter 217.155(a)(3) requires using a minimum of 2.2 lb O_2/lb BOD_5 if the system is intended to nitrify, which is used below for calculations.

2. Coarse Bubble Requirements

$$\frac{(310\text{ mg/L BOD}_5)(8.34)(4.10\text{ MGD})(2.2\text{ lb O}_2/\text{lb BOD}_5)}{(7.4\%)^{*}(0.075)(0.23)(1{,}440)} = 12{,}687\text{ scfm}$$

* Wastewater Oxygen Transfer Efficiency is based on the actual efficiency for the installed aeration systems based on the manufacturer provided data

ii. Return Sludge Air Lifts
(4)(160 scfm) = 640 scfm

iii. Clarifier Loading Zones
(5,514 ft^3)(30 scfm/1000 ft^3) = 165 scfm

iv. Total Process Air Requirement = 13,492 scfm

Plant No. 2 (Existing South Kuehler) Solids Air

i. Aerobic Digester
(61,473 ft^3)(30 scfm/1000 ft^3) = 1,844 scfm

ii. Waste Sludge & Sludge Transfer Air Lifts
(3)(40 scfm) + (4)(40 scfm) = 280 scfm

iii. Total Solids Air Requirement = 2,124 scfm

Plant No. 3 Process Air

i. Aeration Basin

1. Air Required for Treatment

$$\frac{(1.2)(310\ \text{mg/L BOD}_5) + (4.3)(50\ \text{mg/L NH}_3\text{-N})}{(310\ \text{mg/L BOD}_5)} = 1.9\ \text{lb O}_2\text{/ lb BOD}_5{}^{*}$$

*TCEQ Chapter 217.155(a)(3) requires using a minimum of 2.2 lb O_2/lb BOD_5 if the system is intended to nitrify, which is used below for calculations.

2. Fine Bubble Requirements

$$\frac{(310\ \text{mg/L BOD}_5)(8.34)(2.10\ \text{MGD})(2.2\ \text{lb O}_2\text{/lb BOD}_5)(0.685)}{(10.8\%)^{*}(0.075)(0.23)(1{,}440)} = 3{,}050\ \text{scfm}$$

* TCEQ Wastewater Oxygen Transfer Efficiency for Coarse Bubble (2.0%/ft. x 12 ft of submergence x 0.45)
** TCEQ Chapter 217 Table F.5 Submergence Correction Factor for 19' Subermgence

ii. Return Sludge Air Lifts
(2)(160 scfm) = 320 scfm

iii. Post Aeration Basin
(3,200 ft^3)(30 scfm/1000 ft^3) = 96 scfm

iv. Clarifier Loading Zones
(3,800 ft^3)(30 scfm/1000 ft^3) = 114 scfm

v. Total Process Air Requirement = 3,580 scfm

Plant No. 3 Solids Air

i. Aerobic Digester
(287,000 ft^3)(30 scfm/1000 ft^3) = 8,610 scfm

ii. Sludge Transfer Air Lifts
(2)(40 scfm) = 80 scfm

iii. Aerated Grit Chamber
(17,783 ft^3)(30 scfm/1000 ft^3) = 533 scfm

iv. Total Solids Air Requirement = 9,223 scfm

m. Blower Capacities

Plant No. 1 (Existing North Kuehler) Process Air

i. Existing Blower Capacity
(5)(2,140 scfm) = 10,700 scfm

ii. Proposed Blower Capacity*
(1)(2,140 scfm) = 2,140 scfm

iii. Total Blower Capacity
(6)(2,140 scfm) = 12,840 scfm

iv. Firm Blower Capacity with Largest Unit out of Service*
(5)(2,140 scfm) = 10,700 scfm

*The proposed blower will be the common spare blower for the process and air solids air blower banks. This proposed blower is the same proposed blower noted below. There are 7 total blowers at Plant No. 1 (Existing North Kuehler).

Plant No. 1 (Existing North Kuehler) Solids Air

i. Existing Blower Capacity
(1)(2,140 scfm) = 2,140 scfm

ii. Proposed Blower Capacity*
(1)(2,140 scfm) = 2,140 scfm

iii. Total Blower Capacity
(2)(2,140 scfm) = 4,280 scfm

iv. Firm Blower Capacity with Largest Unit out of Service*
(1)(2,140 scfm) = 2,140 scfm

*The proposed blower will be the common spare blower for the process air and solids air blower banks. This proposed blower is the same proposed blower noted above There are 7 total blowers at Plant No. 1 (Existing North Kuehler).

Plant No. 2 (Existing South Kuehler) Process Air

i. Proposed Blower Capacity
(5)(4,000 scfm) = 20,000 scfm

ii. Firm Blower Capacity with Largest Unit out of Service
(4)(4,000 scfm) = 16,000 scfm

Plant No. 2 (Existing South Kuehler) Solids Air

i. Existing Blower Capacity
(2)(2,190 scfm) = 4,380 scfm

ii. Firm Blower Capacity with Largest Unit out of Service
(1)(2,190 scfm) = 2,190 scfm

Plant No. 3 Process Air

i. Proposed Blower Capacity
(2)(4,000 scfm) = 8,000 scfm

ii. Firm Blower Capacity with Largest Unit out of Service
(1)(4,000 scfm) = 4,000 scfm

Plant No. 3 Solids Air

i. Proposed Blower Capacity
(4)(3,150 scfm) = 12,600 scfm

ii. Firm Blower Capacity with Largest Unit out of Service
(3)(3,150 scfm) = 9,450 scfm

PHASE III – 15.4 MGD

I. SCOPE

The proposed Phase III facility will be a permanent concrete plant with suspended growth activated sludge process with biological nutrient removal and single stage nitrification. The facility will include all of the existing treatment units form the 9.3 MGD Phase II facility. The existing screening structure will house a new additional screen, the existing lift station will house new pumps, the existing UV disinfection basin will house new additional UV modules, and the existing house a new additional belt press. New process units include anaerobic basins, anoxic basins, aeration basins, secondary clarifiers, tertiary dual media filters, aerobic digesters, and positive displacement blowers.

II. WASTEWATER TREATMENT PLANT DESIGN

A. DESIGN CRITERIA

1. Daily Effluent Limits

a. BOD_5 = 10 mg/L

b. TSS = 15 mg/L

c. NH_3-N = 3 mg/L

d. Total Phosphorus = 1 mg/L

e. DO = 4 mg/L

f. *E Coli* = 126 number colonies/100 mL

2. Process Criteria

The criteria used for the constructed aeration basins was based on TCEQ Chapter 217 criteria and more conservative measures requested by the client.

a. Minimum Hydraulic Detention Time for Aerated Grit Chamber (minutes) = 3.0

b. Maximum Aeration Basin Organic Loading (lbs BOD_5/day/1,000 ft^3) = 35

c. Maximum Clarifier Surface Loading at Peak Flow (gal/day/ft^2) = 1,200

d. Minimum Clarifier Detention Time (hours) = 1.8

e. Maximum Clarifier Weir Loading at Peak Flow (gal/day/ft) = 30,000

f. Maximum Dual Media Filter Flux Rate at Peak Flow (gal/min/ft^2) = 4

g. Maximum Filtration Rate at Peak Flow w/ One Filter Out of Service = 5 (gal/min/ft^2)

h. Minimum Solids Retention Time in Aerobic Digester* (days) = 28*

i. Minimum Air Required for Digester (scfm/1,000 ft^3) = 30

j. Minimum Oxygen Required for Aeration Basins = 2.2 (lbs O_2/1 lb BOD_5)

*28-day SRT utilized instead of a 40-day SRT for use of a multi-stage digester per EPA publication "Control of Pathogens and Vector Attraction in Sewage Sludge."

B. TREATMENT FACILITIES

1. Flow

a. Average (Design) = 1.0Q = 15,400,000 gpd = 10,694 gpm

b. Peak (2-hour) = 3.0Q = 46,200,000 gpd = 32,083 gpm

2. Influent Composition

The following influent wastewater compositions are based on composite samples collected at the existing headworks over a 1 year period. The design values for BOD_5, TSS, and NH_3-N are calculated by adding one (1) standard deviation to the average.

a. BOD_5 = 310 mg/L

b. TSS = 350 mg/L

c. NH_3-N = 50 mg/L

d. TP = 8 mg/L

3. Organic Loadings

a. BOD_5 = (15.40 MGD)(8.34)(310 mg/L)* = 39,815 lbs BOD_5/day

b. TSS = (15.40 MGD)(8.34)(350 mg/L) = 44,953 lbs TSS/day

c. NH_3-N = (15.40 MGD)(8.34)(50 mg/L) = 6,422 lbs NH_3-N/day

d. Total P = (15.40 MGD)(8.34)(8 mg/L) = 1,284 lbs P/day

4. Process Basins and Equipment

   a. Screening. A third mechanical screen will be installed in this phase. All three screens, two existing and one proposed will have a minimum hydraulic capacity of 23.1 MGD. Two screens will be able to handle the design peak flow of the facility, and the third screen will be a spare. The screening channels will be covered, equipment enclosed, and connected to an odor control system.

   b. Grit Chamber. The existing aerated grit chambers will be remain in this phase. The grit chambers will be covered and connected to an odor control system.

      i. Required Volume at Peak Flow
      (32,083 gpm)(3 min)/(7.48gal/ft^3) = 12,868 ft^3

      ii. Existing Volume
      $2[(27\ ft)^2(8.03\ ft)+((27\ ft)^2(12.5\ ft)/3)]$ = 17,783 ft^3

      iii. Actual Detention Time at Peak Flow
      (17,783 ft^3)(7.48)/(32,083 gpm) = 4.1 minutes

   c. Lift Station. The existing wet well will remain in this phase. A total of six new pumps, five duty and one standby, will be installed with a minimum firm hydraulic pumping capacity of 46.2 MGD, the design peak flow of the facility. The lift station will be covered and connected to an odor control system.

   d. Elevated Flow Splitter. The existing elevated flow splitter will remain in this phase. The weir gates will be modified to proportionately send flow to four secondary treatment plants based on the following splits.

      i. Plant No. 1 (Existing North Kuehler) – 3.10 MGD

      ii. Plant No. 2 (Existing South Kuehler) – 4.10 MGD

      iii. Plant No. 3 – 4.10 MGD

      iv. Plant No. 4 – 4.10 MGD

   e. Secondary Treatment.

   Plant No. 1 (Existing North Kuehler) – 3.10 MGD This secondary treatment train consists of aeration basins and secondary clarifiers operating as a conventional activated sludge process with single stage nitrification. Phosphorous is removed using alum added upstream of the clarifiers. Alum addition for chemical phosphorous removal exists today and was previously approved by TCEQ. This process will be retained. No modifications or changes will be made to the secondary treatment facilities from those described in the 9.3 MGD Phase II report. Refer to that report for all sizing calculations.

Plant No. 2 (Existing South Kuehler) – 4.10 MGD. This secondary treatment train consists of aeration basins and secondary clarifiers operating as a conventional activated sludge process with single stage nitrification. Phosphorous is removed using alum added upstream of the clarifiers. Alum addition for chemical phosphorous removal exists today and was previously approved by TCEQ. This process will be retained. No modifications or changes will be made to the secondary treatment facilities from those described in the 9.3 MGD Phase II report. Refer to that report for all sizing calculations.

Plant No. 3 – 4.10 MGD. This secondary treatment train consists of an anaerobic basin, anoxic basin, aeration basin, and secondary clarifier operating as a biological nutrient removal, conventional activated sludge process with single stage nitrification. Phosphorous is removed with the biological nutrient removal process with alum addition as a secondary treatment method. Nitrogen removal is limited to treatment of the return activated sludge side stream. The intent of the partial nitrogen removal is only to help promote the biological phosphorous removal process by reducing the amount of nitrates in the process. The anoxic basin and nitrogen removal is not required for TPDES discharge permit compliance. The existing Plant No. 3 will be expanded to add a second train.

Anaerobic Basin

i. Required Volume at Average Daily Flow
(4,100,000 gal/day)(1.5 hr)/(24 hr/day)/(7.48gal/ft^3) = 34,258 ft^3

ii. Existing Volume
(20 ft)(48 ft)(19 ft) = 18,240 ft^3

iii. Proposed Volume
(20 ft)(48 ft)(19 ft) = 18,240 ft^3

iv. Total Volume
18,240 ft^3 + 18,240 ft^3 = 36,480 ft^3

v. Actual Hydraulic Retention Time at Average Daily Flow
(36,480 ft^3)(7.48gal/ft^3)(24 hr/day)/(4,100,000 gal/day) = 1.6 hrs

Aeration Basin

i. Required Volume Using Traditional Design Method
(4.10 MGD)(8.34)(310 mg/L)/(35 lb BOD$_5$/1000 ft^3) = 302,861 ft^3

ii. Existing Volume
(20 ft)(82 ft)(120 ft) = 196,800 ft^3

iii. Proposed Volume
(20 ft)(82 ft)(120 ft) = 196,800 ft^3

iv. Total Volume
196,800 ft^3 + 196,800 ft^3 = 393,600 ft^3

v. Actual Organic Loading
10,600 lb/day/(393,600 ft^3)(1,000 ft^3) = 26.9lb BOD$_5$/ 1000 ft^3

Anoxic Selector Basin for RAS Side Stream

i. Required Volume at Average Daily Flow
(4,920,000 gal/day)(0.5 hr)/(24 hr/day)/(7.48gal/ft^3) = 13,703 ft^3

ii. Existing Volume
(20 ft)(19 ft)(19 ft) = 7,220 ft^3

iii. Proposed Volume
(20 ft)(19 ft)(19 ft) = 7,220 ft^3

iv. Total Volume
7,220 ft^3 + 7,220 ft^3 = 14,440 ft^3

v. Actual Hydraulic Retention Time
(14,440 ft^3)(7.48gal/ft^3)(24 hr/day)/(4,920,000 gal/day) = 0.53 hrs

Secondary Clarifiers

i. Required Surface Area At Peak Flow
(12.3 MGD)(1,000,000 gal/MG)/1200 gal/day/ft^2 = 10,250 ft^2

ii. Existing Surface Area
(80 ft)^2(π)/(4) = 5,026 ft^2

iii. Proposed Surface Area
(80 ft)^2(π)/(4) = 5,026 ft^2

iv. Total Surface Area
5,026 ft^2 + 5,026 ft^2 = 10,052 ft^2

v. Proposed Surface Loading at Peak Flow
(12,300,000 gpd)/(10,052 ft^2) = 1,224 gpd/ft^2

The proposed surface loading at peak flow exceed the TCEQ value. A variance will be requested from TCEQ for the proposed clarifier. The slightly increased loading rate at peak flow is acceptable for performance since there are tertiary filters following the clarifiers. By installing an 80 ft diameter clarifier, it allows NBU to match the diameter of all its existing 5 clarifiers, which is beneficial for maintenance and operation of the clarifiers.

vi. Proposed Clarifier Side Water Depth = 13.0 ft

vii. Proposed Hydraulic Detention Time at Peak Flow
(10,052 ft^2)(13.0 ft)(7.48 gal/ft^3)(24 hr/day)/
(1,000,000 gallons/MG)(12.30 MGD) = 1.91 hours

viii. The proposed clarifier will not utilize traditional weirs and baffles. It will utilize a submerged effluent launder system, which consists of a full perimeter submerged launder with submerged ports sized to control the inlet rate into the submerged launder. This will maintain equal distribution of flow from the center of the clarifier outwards to the launder. The Submerged Effluent Launder system design is a proprietary designed and manufactured by Ovivo USA, LLC.

Plant No. 4 – 4.10 MGD. This secondary treatment train consists of an anaerobic basin, anoxic basin, aeration basin, and secondary clarifier operating as a biological nutrient removal, conventional activated sludge process with single stage nitrification. Phosphorous is removed with the biological nutrient removal process with alum addition as a secondary treatment method. Nitrogen removal is limited to treatment of the return activated sludge side stream. The intent of the partial nitrogen removal is only to help promote the biological phosphorous removal process by reducing the amount of nitrates in the process. The anoxic basin and nitrogen removal is not required for TPDES discharge permit compliance.

Anaerobic Basin

i. Required Volume at Average Daily Flow
(4,100,000 gal/day)(1.5 hr)/(24 hr/day)/(7.48gal/ft^3) = 34,258 ft^3

ii. Proposed Volume
(2)(20 ft)(48 ft)(19 ft) = 36,480 ft^3

iii. Actual Hydraulic Retention Time at Average Daily Flow
(36,480 ft^3)(7.48gal/ft^3)(24 hr/day)/(4,100,000 gal/day) = 1.6 hrs

Aeration Basin

i. Required Volume Using Traditional Design Method
(4.10 MGD)(8.34)(310 mg/L)/(35 lb BOD$_5$/1000 ft^3) = 302,861 ft^3

ii. Proposed Volume
(2)(20 ft)(82 ft)(120 ft) = 393,600 ft^3

iii. Actual Organic Loading
10,600 lb/day/(393,600 ft^3)(1,000 ft^3) = 26.9lb BOD$_5$/ 1000 ft^3

Anoxic Selector Basin for RAS Side Stream

i. Required Volume at Average Daily Flow
(4,920,000 gal/day)(0.5 hr)/(24 hr/day)/(7.48gal/ft^3) = 13,703 ft^3

ii. Proposed Volume
(2)(20 ft)(19 ft)(19 ft) = 14,440 ft^3

iii. Actual Hydraulic Retention Time
(14,440 ft^3)(7.48gal/ft^3)(24 hr/day)/(4,920,000 gal/day) = 0.53 hrs

Secondary Clarifiers

i. Required Surface Area At Peak Flow
(12.3 MGD)(1,000,000 gal/MG)/1200 gal/day/ft^2 = 10,250 ft^2

ii. Proposed Surface Area
(2)(80 ft)^2(π)/(4) = 10,052 ft^2

iii. Proposed Surface Loading at Peak Flow
(12,300,000 gpd)/(10,052 ft^2) = 1,224 gpd/ft^2

The proposed surface loading at peak flow exceed the TCEQ value. A variance will be requested from TCEQ for the proposed clarifier. The slightly increased loading rate at peak flow is acceptable for performance since there are tertiary filters following the clarifiers. By installing an 80 ft diameter clarifier, it allows NBU to match the diameter of all its existing 5 clarifiers, which is beneficial for maintenance and operation of the clarifiers.

iv. Proposed Clarifier Side Water Depth = 13.0 ft

v. Proposed Hydraulic Detention Time at Peak Flow
(10,052 ft^2)(13.0 ft)(7.48 gal/ft^3)(24 hr/day)/
(1,000,000 gallons/MG)(12.30 MGD) = 1.91 hours

vi. The proposed clarifiers will not utilize traditional weirs and baffles. It will utilize a submerged effluent launder system, which consists of a full perimeter submerged launder with submerged ports sized to control the inlet rate into the submerged launder. This will maintain equal distribution of flow from the center of the clarifier outwards to the launder. The Submerged Effluent Launder system design is a proprietary designed and manufactured by Ovivo USA, LLC.

f. Tertiary Intermittently Backwashed, Granular Dual Media Filters. Flow from all four parallel secondary treatment trains will flow to the tertiary intermittently backwashed, granular dual media filters. The existing filter beds will remain and additional filter beds will be added. Each filter will consist of dual media.

i. Required Surface Area at Peak Flow
(32,083 gpm)/(4 gpm/ ft^2) = 8,021 ft^2

ii. Existing Surface Area
(4)(16 ft)(84 ft) = 5,376 ft^2

iii. Proposed Surface Area
(2)(16 ft)(84 ft) = 2,688 ft^2

iv. Total Surface Area
5,376 ft^2 + 2,688 ft^2 = 8,064 ft^2

v. Actual Filtration Rate at Peak Flow
(32,083 gpm)/(8,064 ft^2) = 3.98 gpm/ft^2

vi. Actual Filtration Rate at Peak Flow with One Filter Out of Service
(32,083 gpm)/(6,720 ft^2) = 4.77 gpm/ft^2

g. Ultraviolet Disinfection. The existing structure will remain and all existing UV modules will remain. The fourth channel, constructed but not used in the 9.3 MGD Phase II, will be used with new UV modules added in it. Flow will pass through four parallel channels containing ultraviolet (UV) treatment modules. The UV modules will be a low-pressure high-output type and utilizing 254 nm wavelength light with an assumed 65% minimum transmittance and 20 mJ/cm^2 UV dose rate. Three channels will be required to treat the full peak flow of 46.2 MGD, with each channel capable of treatment 15.4 MGD. The third channel will be a redundant 15.4 MGD treatment channel. A minimum UV contact time of 20 seconds will be provided at peak flow, with one channel out of service.

h. Post Aeration. Flow will pass through a post aeration basin that will include coarse bubble aeration to provide oxygen to the wastewater. The air demand is included in the Air Requirements section of this report.

i. Aerobic Digesters. All basins from the 9.3 MGD Phase II will remain. Additional digester basins will be added for the additional flow. All sludge will flow to a common digester that will feed the existing belt press dewatering facility. The digester sizing assumes one pound of solids produced per pound of BOD_5 applied plus alum sludge from the chemical phosphorous removal, solids are 70% volatile organics, 38% of the volatiles are destroyed during digestion, and the average MLSS concentration in the digesters is 30,000 mg/l.

i. Solids Production
(39,815 lbs BOD_5 /day)(1 lb solids/1 lb BOD_5) = 39,815 lbs solids/day

ii. Digested Solids Production
(39,815 lbs solids/day)(1-(0.38)(0.7)) = 29,224 lbs solids/day

iii. Average Digested Solids Production
(39,815 lbs solids/day + 29,224 lbs solids/day)/2 = 34,520 lbs solids/day

iv. Alum Sludge Production
619 lbs solids/day+819 lbs solids/day+(2)223 lbs solids/day = 1,884 lbs solids/day

v. Total Average Solids Production
34,520 lbs solids/day + 1,884 lbs solids/day = 36,404 lbs solids/day

vi. Total Solids in Digester for 28-day SRT*
(36,404 lbs solids/day)(28 days) = 1,019,312 lbs solids

vii. Required Volume
(1,019,312 lbs solids)(10^6)/(8.34)/(30,000 mg/l MLSS)/(7.48)= 544,651 ft^3

viii. Existing Volume
43,156 ft^3 + 61,473 ft^3 + 287,000 ft^3 = 391,629 ft^3

ix. Proposed Volume
(3)(20 ft)(60 ft)(70 ft) = 252,000 ft^3

x. Total Volume
391,629 ft^3 + 252,000 ft^3 = 643,629 ft^3

xi. Actual Solids Residence Time
(643,629 ft^3)(7.48)(8.34)(30,000 mg/l)/(10^6)/(36,404 lbs/day)=33.1 days

*28-day SRT utilized instead of 40-day SRT for use of a two stage digester per EPA publication "Control of Pathogens and Vector Attraction in Sewage Sludge".

j. Sludge Thickening. The existing aerobic digesters at the North Kuehler WWTP and South Kuehler WWTP contain a combination of gravity thickeners and submerged membranes that are used to thicken sludge. These sludge thickening components will be retained with the expansion. Also, additional submerged membranes will be added with the proposed digester volume to maintain an average MLSS concentration in the digesters of 30,000 mg/l.

k. Sludge Dewatering. All sludge from both the existing North Kuehler WWTP and South Kuehler WWTP is pumped to the exiting belt press sludge dewatering facility. The existing facility will be expanded to accommodate the increased sludge production from the expansion. The belt press sizing assumes operation 8 hours per day and 6 days per week, and a maximum feed rate of 75 gpm/meter and 750 lbs of solids per hour per meter, a sludge feed rate of 30,000 mg/l. In the event a belt press is out of service, the remaining belt presses can be operated for longer durations to maintain sludge processing capabilities.

i. Total Belt Width Required Based on Hydraulic Capacity
(142,642 gal/d)(7/6)/(480 op min/d)/(75 gal/min/m) = 4.6 m belt width

ii. Total Belt Width Required Based on Solids Capacity
(36,403 lbs solids/d)(7/6)/(8 op hr/d)/(750 lbs solids/hr/m) = 7.1 m belt width

iii. Existing Belt Width
(3)(2 meter belt presses) = 6 meters belt width

iv. Proposed Belt Width
(1)(2 meter belt press) = 2 meters belt width

v. Total Belt Width
6 meters + 2 meters = 8 meters belt width

l. Air Requirements. The existing North Kuehler WWTP will be served by two blower banks, one each for process air and solids handling air, with a common spare blower connected with valves and piping. The existing South Kuehler WWTP will be served by two separate blower banks, one each for process air and solids handling air. Each bank will have its own spare blower. The blower banks at the existing North Kuehler WWTP and South Kuehler WWTP will not be modified in this expansion. The proposed treatment units for both Plant No. 3 & Plant No. 4 will be served by two separate blower banks, one each for process air and solids handling air. Each bank will have its own spare blower.

Plant No. 1 (Existing North Kuehler) Process Air. No changes are being made to this treatment system air demand or blower system. Refer to the 9.3 MGD Phase II report for details on the air demand for this system.

Plant No. 1 (Existing North Kuehler) Solids Air. No changes are being made to this treatment system air demand or blower system. Refer to the 9.3 MGD Phase II report for details on the air demand for this system.

Plant No. 2 (Existing South Kuehler) Process Air. No changes are being made to this treatment system air demand or blower system. Refer to the 9.3 MGD Phase II report for details on the air demand for this system.

Plant No. 2 (Existing South Kuehler) Solids Air. No changes are being made to this treatment system air demand or blower system. Refer to the 9.3 MGD Phase II report for details on the air demand for this system.

Plant No. 3 & Plant No. 4 Process Air

i. Plant No. 3 Aeration Basin

1. Air Required for Treatment

$$\frac{(1.2)(310 \text{ mg/L } BOD_5) + (4.3)(50 \text{ mg/L } NH_3\text{-}N)}{(310 \text{ mg/L } BOD_5)} = 1.9 \text{ lb } O_2/ \text{ lb } BOD_5{*}$$

*TCEQ Chapter 217.155(a)(3) requires using a minimum of 2.2 lb O_2/lb BOD_5 if the system is intended to nitrify, which is used below for calculations.

2. Fine Bubble Requirements

$$\frac{(310 \text{ mg/L } BOD_5)(8.34)(4.10 \text{ MGD})(2.2 \text{ lb } O_2/\text{lb } BOD_5)(0.685)}{(10.8\%)(0.075)(0.23)(1{,}440)} = 5{,}955 \text{ scfm}$$

* TCEQ Wastewater Oxygen Transfer Efficiency for Coarse Bubble (2.0%/ft. x 12 ft of submergence x 0.45)

** TCEQ Chapter 217 Table F.5 Submergence Correction Factor for 19' Submergence

ii. Plant No. 4 Aeration Basin

3. Air Required for Treatment

$$\frac{(1.2)(310 \text{ mg/L } BOD_5) + (4.3)(50 \text{ mg/L } NH_3\text{-}N)}{(310 \text{ mg/L } BOD_5)} = 1.9 \text{ lb } O_2/ \text{ lb } BOD_5{*}$$

*TCEQ Chapter 217.155(a)(3) requires using a minimum of 2.2 lb O_2/lb BOD_5 if the system is intended to nitrify, which is used below for calculations.

4. Fine Bubble Requirements

$$\frac{(310\text{ mg/L BOD}_5)(8.34)(4.10\text{ MGD})(2.2\text{ lb O}_2\text{/lb BOD}_5)(0.685)}{(10.8\%)(0.075)(0.23)(1{,}440)} = 5{,}955\text{ scfm}$$

* TCEQ Wastewater Oxygen Transfer Efficiency for Coarse Bubble (2.0%/ft. x 12 ft of submergence x 0.45)
** TCEQ Chapter 217 Table F.5 Submergence Correction Factor for 19' Submergence

iii. Plant No. 3 & Plant No. 4 Return Sludge Air Lifts
(4)(160 scfm) + (4)(160 scfm) = 1,280 scfm

iv. Post Aeration Basin
($3,200\ ft^3$)($30\ scfm/1000\ ft^3$) = 96 scfm

v. Plant No. 3 & Plant No. 4 Clarifier Loading Zones
[(2)($3,800\ ft^3$) + (2) 2)($3,800\ ft^3$)]($30\ scfm/1000\ ft^3$) = 456 scfm

vi. Total Process Air Requirement = 13,742 scfm

Plant No. 3 & Plant No. 4 Solids Air

i. Aerobic Digester
($539,000\ ft^3$)($30\ scfm/1000\ ft^3$) = 16,170 scfm

ii. Sludge Transfer Air Lifts
(8)(40 scfm) = 320 scfm

iii. Aerated Grit Chamber
($17,783\ ft^3$)($30\ scfm/1000\ ft^3$) = 533 scfm

iv. Total Solids Air Requirement = 17,023 scfm

m. Blower Capacities

Plant No. 1 (Existing North Kuehler) Process Air. No changes are being made to this treatment system air demand or blower system. Refer to the 9.3 MGD Phase II report for details on the existing blower system.
Plant No. 1 (Existing North Kuehler) Solids Air. No changes are being made to this treatment system air demand or blower system. Refer to the 9.3 MGD Phase II report for details on the existing blower system.

Plant No. 2 (Existing South Kuehler) Process Air. No changes are being made to this treatment system air demand or blower system. Refer to the 9.3 MGD Phase II report for details on the existing blower system.

Plant No. 2 (Existing South Kuehler) Solids Air. No changes are being made to this treatment system air demand or blower system. Refer to the 9.3 MGD Phase II report for details on the existing blower system.

Plant No. 3 & Plant No. 4 Process Air

i. Existing Blower Capacity
(2)(4,000 scfm) = 8,000 scfm

ii. Proposed Blower Capacity
(3)(4,000 scfm) = 8,000 scfm

iii. Total Blower Capacity
(5)(4,000 scfm) = 20,000 scfm

iv. Firm Blower Capacity with Largest Unit out of Service
(4)(4,000 scfm) = 16,000 scfm

Plant No. 3 & Plant No. 4 Solids Air

i. Existing Blower Capacity
(4)(3,150 scfm) = 12,600 scfm

ii. Proposed Blower Capacity
(3)(3,150 scfm) = 9,450 scfm

iii. Total Blower Capacity
(7)(3,150 scfm) = 22,050 scfm

iv. Firm Blower Capacity with Largest Unit out of Service
(6)(3,150 scfm) = 18,900 scfm

ATTACHMENT I

FLOW SCHEMATICS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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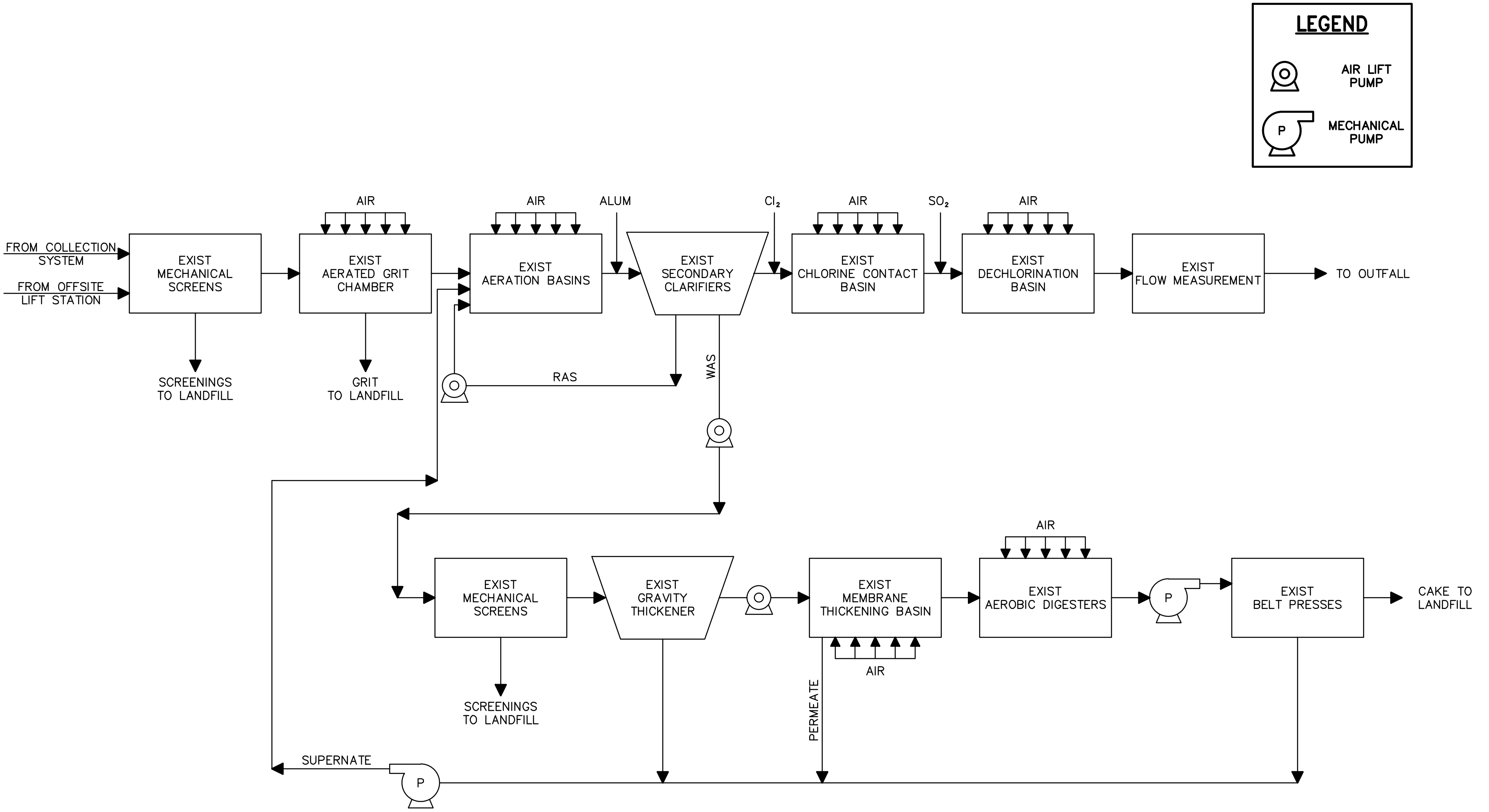
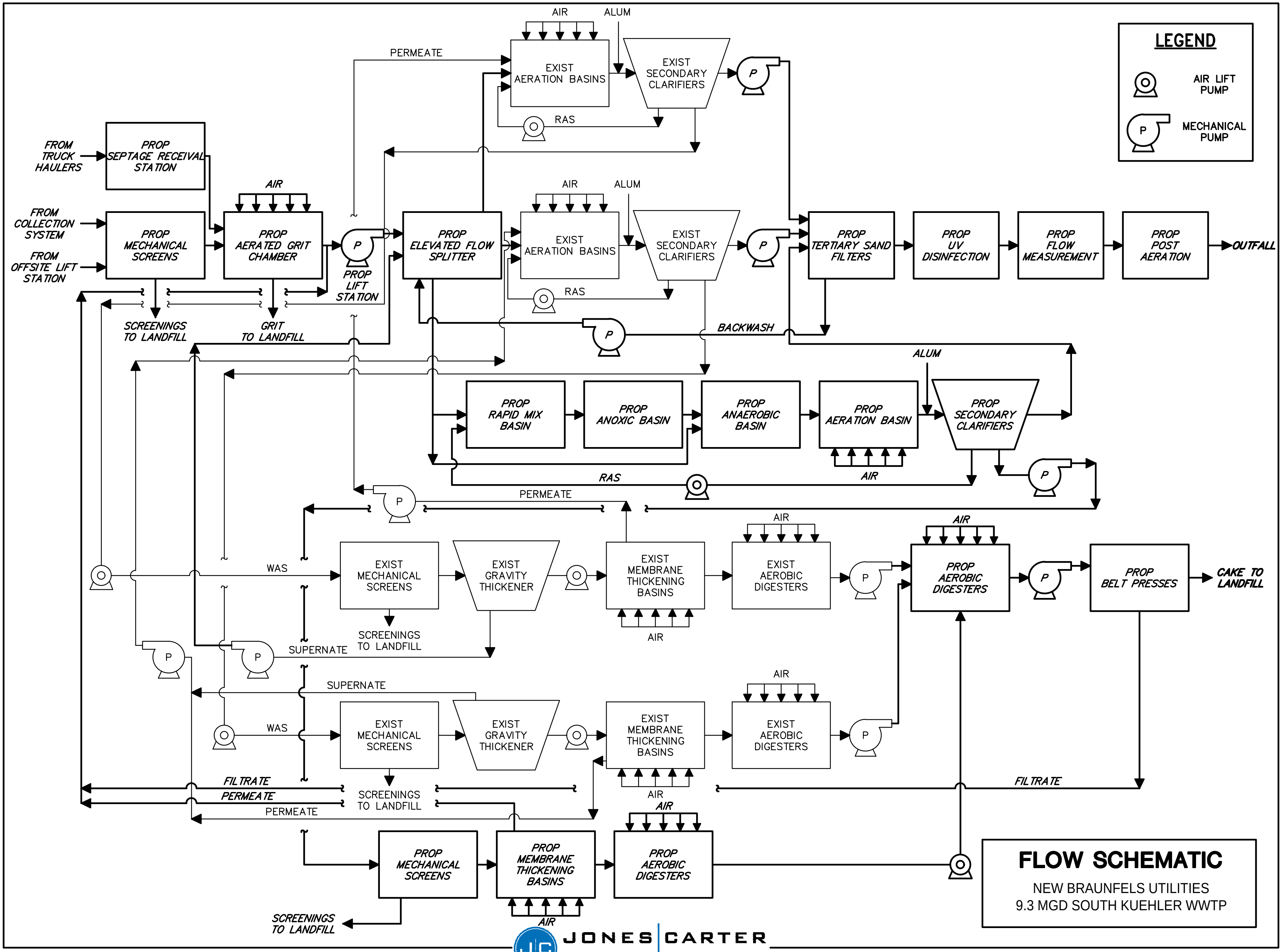


FLOW SCHEMATIC

NEW BRAUNFELS UTILITIES
4.2 MGD SOUTH KUEHLER WWTP



FLOW SCHEMATIC

NEW BRAUNFELS UTILITIES
9.3 MGD SOUTH KUEHLER WWTP

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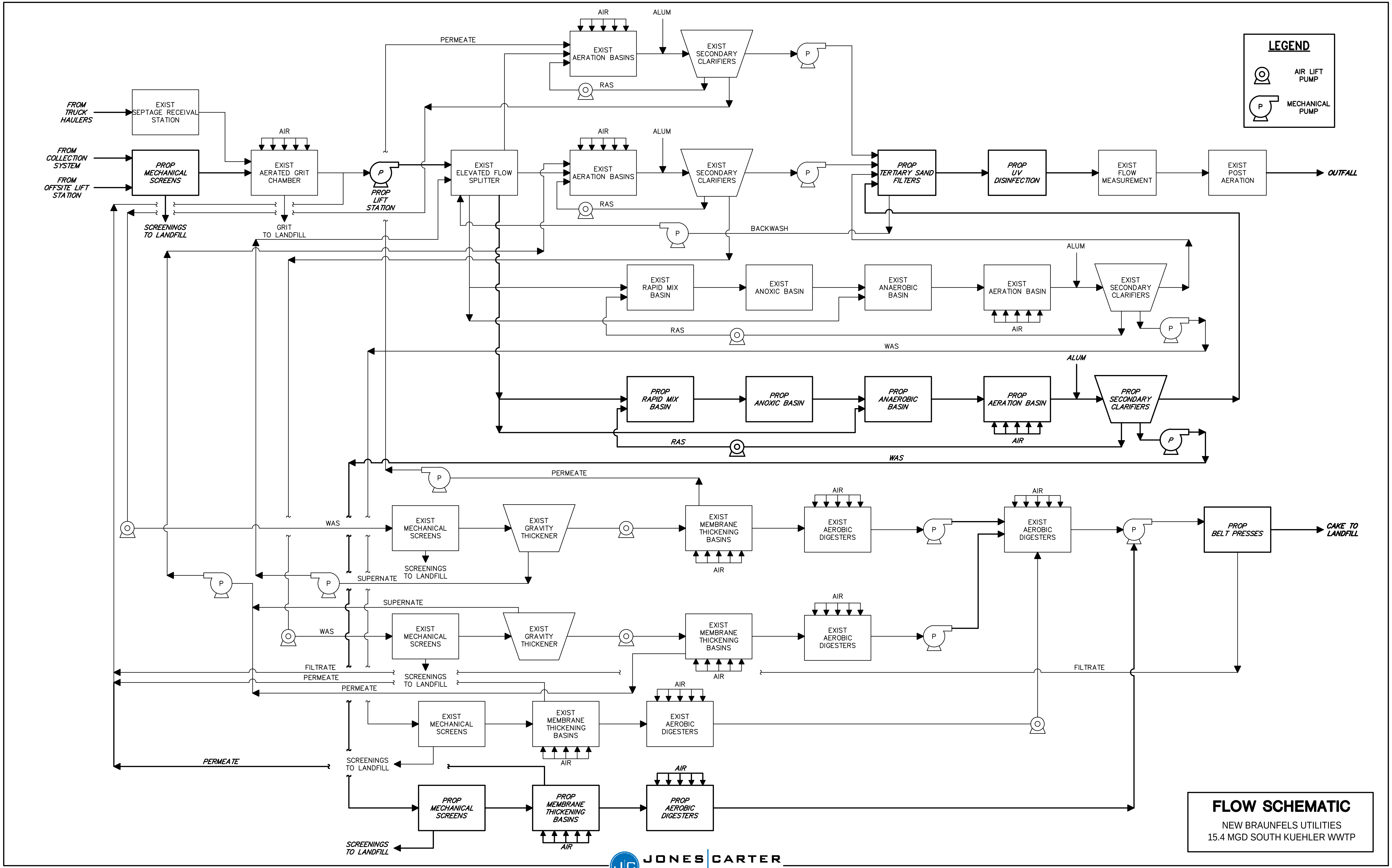

FLOW SCHEMATIC

NEW BRAUNFELS UTILITIES
15.4 MGD SOUTH KUEHLER WWTP

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ATTACHMENT J

SITE DRAWING

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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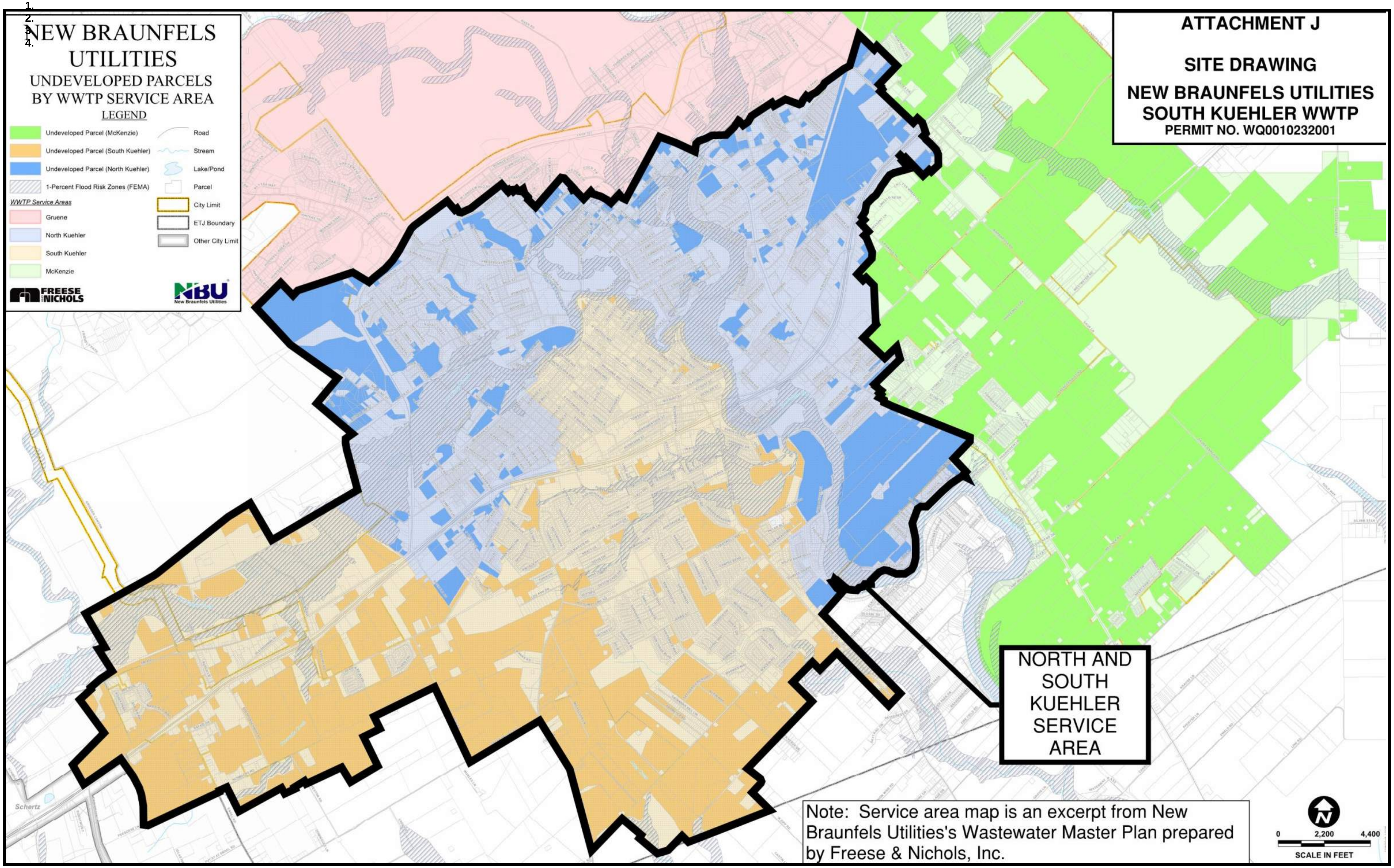
1.
2.
3.
4.

ATTACHMENT J

SITE DRAWING

NEW BRAUNFELS UTILITIES SOUTH KUEHLER WWTP

PERMIT NO. WQ0010232001



Note: Service area map is an excerpt from New Braunfels Utilities's Wastewater Master Plan prepared by Freese & Nichols, Inc.

ATTACHMENT K

JUSTIFICATION FOR PLANT EXPANSION

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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JUSTIFICATION FOR PLANT EXPANSION
NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

The New Braunfels Utilities ("NBU") South Kuehler Wastewater Treatment Plant serves the central and southwest portions of the City of New Braunfels. While not all inclusive, this generally includes areas south of IH-35 and west of State Highway 46.

Expansion of the wastewater treatment plant will be necessary to provide service to undeveloped areas within the North and South Kuehler service areas within the City of New Braunfels. As part of this expansion, all flow that currently flows to the existing North Kuehler WWTP will now go to the South Kuehler WWTP. This diversion of flow will occur with the next proposed expansion phase. This is reflected in the flow projections. The existing North Kuehler TPDES discharge permit will expire upon completion of the next proposed expansion phase South Kuehler WWTP. At this point, the existing North Kuehler WWTP will no longer discharge from its existing, permitted outfall, which will be abandoned. Additionally, upon completion of the next expansion phase, the existing South Kuehler WWTP will no longer discharge from its existing, permitted outfall, which will be abandoned. As part of the expansion, the existing South Kuehler outfall will be relocated a slightly upstream and used for all future phases. Also, the proposed expansion will incorporate the existing North Kuehler WWTP treatment units as part of the expanded South Kuehler WWTP.

At build out, there will be approximately 47,212 residential connections, 5,215 apartment units, 1,640 commercial connections and 327 other connections. For design purposes, the wastewater flow for residential, apartment, commercial and other connections is 240 gallons per day per connection (gpd/conn.), 150 gpd/conn, 1,000 gpd/conn, and 5,000 gpd/conn., respectively. The next page shows the connection and flow projection for the NBU South Kuehler WWTP to complete build out.

Following is the construction schedule for the current and final plant phases:

Proposed flow	Phase I	Phase II	Phase III
Design Flow (MGD)	4.20	9.30	15.40
2-Hr Peak Flow (MGD)	12.60	27.9	46.20
Date construction to commence	--	8/2020	1/2026
Date construction completed and discharge begins	--	7/2023	12/2029

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT
CONNECTION AND FLOW PROJECTION

Month / yr	**Single family residential**		**Apartment**		**Commercial**		**Other**		**Total**	
	connections	**flow (gpd)**	**units**	**flow (gpd)**	**connections**	**flow (gpd)**	**connections**	**flow (gpd)**	**connections**	**flow (gpd)**
Jan-20	9,685	2,324,400	1,259	188,850	374	374,000	19	95,000	11,337	2,982,250
Jan-21	10,086	2,420,640	1,319	197,850	398	398,000	31	155,000	11,834	3,171,490
Jan-22	10,502	2,520,480	1,379	206,850	422	422,000	43	215,000	12,346	3,364,330
Jan-23	10,937	2,624,880	1,439	215,850	446	446,000	55	275,000	12,877	3,561,730
Jan-24	20,882	5,011,680	2,235	335,250	644	644,000	70	350,000	23,831	6,340,930
Jan-25	21,739	5,217,360	2,331	349,650	680	680,000	82	410,000	24,832	6,657,010
Jan-30	26,574	6,377,760	2,879	431,850	860	860,000	142	710,000	30,455	8,379,610
Jan-35	32,477	7,794,480	3,546	531,900	1,086	1,086,000	202	1,010,000	37,311	10,422,380
Jan-40	39,554	9,492,960	4,348	652,200	1,352	1,352,000	261	1,305,000	45,515	12,802,160
Jan-44	46,276	11,106,240	5,107	766,050	1,604	1,604,000	315	1,575,000	53,302	15,051,290
Jul-44	47,212	11,330,880	5,215	782,250	1,640	1,640,000	327	1,635,000	54,394	15,400,000

ATTACHMENT L

SEWAGE SLUDGE MANAGEMENT PLANS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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SLUDGE MANAGEMENT AND DISPOSAL PLAN
NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT
JULY 2019

INTRODUCTION

This sludge management and disposal plan is being submitted as an attachment to the TPDES permit amendment application for New Braunfels Utilities South Kuehler Wastewater Treatment Plant.

The current phase for New Braunfels Utilities South Kuehler Wastewater Treatment Plant is a 4.20 MGD single stage nitrification activated sludge plant with effluent limits of 10 mg/l BOD and 15 mg/l TSS. The plant will also remove Total Phosphorus by alum precipitation.

DIMENSIONS AND CAPACITIES

Excess solids generated from the activated plant will be wasted to an aerobic digester for further treatment. The liquid stabilized sludge will then be hauled away to a TCEQ permitted land application site for disposal by a licensed sludge hauler. The digester has a volume of 61,473 cu. ft.

SOLIDS GENERATION

Solids to be wasted from the activated sludge process is based on an influent BOD concentration of 310 mg/l and 1.0 pounds of TSS produced per pound of BOD applied. Following is the amount of solids generated by the wastewater treatment plant at design flow and at 75 percent, 50 percent and 25 percent of design flow:

Percent of Design Flow	Flow (MGD)	Waste Sludge Generated (lb/day)
25	1.05	2,715
50	2.10	5,430
75	3.15	8,145
100	4.20	10,860

OPERATING PARAMETERS

The single stage nitrification activated sludge process works best between mixed liquor suspended solids (MLSS) concentrations of 2,000 – 6,000 mg/l. The operator will determine the mixed liquor concentration that produces the highest quality effluent taking into consideration factors such as hydraulic and organic loading, available air capacity, and solids handling. Field testing and laboratory analysis will be done to monitor the MLSS and maintain the appropriate solids concentration.

SOLIDS REMOVAL PROCEDURE

Laboratory analysis and field testing will be conducted to determine the solids concentration in the aeration basin. To maintain an appropriate solids inventory, the amount of solids to be wasted per day is equal to the amount of solids generated per day. This amount is stated in the SOLIDS GENERATION section of this plan. Excess solids will then be wasted from the bottom of the clarifier directly to the aerobic digester to maintain the appropriate solids concentration in the aeration basin.

SOLIDS REMOVAL SCHEDULE

It is assumed that 70% of the solids wasted to the digester are volatile solids and the volatile solids reduction is 38%. For every pound of solids wasted to the digester, 0.73 pounds of solids will need to be disposed of by land application. The average of the waste sludge produced and the remaining digested sludge plus alum sludge generated from phosphorus removal results in Total Solids Disposed per day. In addition, it is assumed that the solids can be thickened to 30,000 mg/l in the digester. At this concentration, a 61,473 cu. ft. digester will hold 115,046 pounds of solids. The capacity of the digester divided by the pounds per day of solids to be disposed of will give the sludge hauling schedule.

Percent of Design Flow	Digested Sludge Production (lb/day)	Avg.Digested Sludge Production (lb/day)	Alum Sludge lbs/day	Total Solids Disposed (lb/day)	Hauling schedule (days)
25	1,993	2,354	210	2,563	45
50	3,985	4,707	420	5,127	22
75	5,978	7,061	629	7,690	15
100	7,970	9,414	839	10,253	11

ULTIMATE SLUDGE DISPOSAL

Sludge will be liquid hauled from the plant by a TCEQ registered sludge transporter to a TCEQ permitted landfill.

A manifest will be issued with each load of sludge that is hauled from the plant. The following information will be on the manifest to document ultimate disposal of the sludge:

1. Date of sludge hauling
2. Generator Name
3. Generator’s address
4. Volume of sludge hauled
5. Name of transporter
6. TCEQ transporter registration number
7. Driver’s name
8. Name of disposal site
9. TCEQ Site permit number
10. Date of disposal
11. Volume of sludge disposed

This information, along with laboratory and field data will be used to determine the amount of solids disposed of in dry weight form.

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JULY 2019

INTRODUCTION

This sludge management and disposal plan is being submitted as an attachment to the TPDES permit amendment application for New Braunfels Utilities South Kuehler Wastewater Treatment Plant.

The next phase for New Braunfels Utilities South Kuehler Wastewater Treatment Plant is a 9.30 MGD single stage nitrification activated sludge plant with effluent limits of 10 mg/l CBOD, 15 mg/l TSS, 3 mg/l NH3-N, and 1.0 mg/l Total Phosphorus. The plant will remove Total Phosphorus by alum precipitation.

DIMENSIONS AND CAPACITIES

Excess solids generated from the activated plant will be wasted to an aerobic digester for further treatment. The liquid stabilized sludge will then be hauled away to a TCEQ permitted land application site for disposal by a licensed sludge hauler. The digester will have a volume of at least 391,629 cu. ft.

SOLIDS GENERATION

Solids to be wasted from the activated sludge process is based on an influent BOD concentration of 310 mg/l and 1.0 pounds of TSS produced per pound of BOD applied. Following is the amount of solids generated by the wastewater treatment plant at design flow and at 75 percent, 50 percent and 25 percent of design flow:

Percent of Design Flow	Flow (MGD)	Waste Sludge Generated (lb/day)
25	2.33	6,011
50	4.66	12,022
75	6.98	18,033
100	9.30	24,044

OPERATING PARAMETERS

The single stage nitrification activated sludge process works best between mixed liquor suspended solids (MLSS) concentrations of 2,000 – 6,000 mg/l. The operator will determine the mixed liquor concentration that produces the highest quality effluent taking into consideration factors such as hydraulic and organic loading, available air capacity, and solids handling. Field testing and laboratory analysis will be done to monitor the MLSS and maintain the appropriate solids concentration.

SOLIDS REMOVAL PROCEDURE

Laboratory analysis and field testing will be conducted to determine the solids concentration in the aeration basin. To maintain an appropriate solids inventory, the amount of solids to be wasted per day is equal to the amount of solids generated per day. This amount is stated in the SOLIDS GENERATION section of this plan. Excess solids will then be wasted from the bottom of the clarifier directly to the aerobic digester to maintain the appropriate solids concentration in the aeration basin.

SOLIDS REMOVAL SCHEDULE

It is assumed that 70% of the solids wasted to the digester are volatile solids and the volatile solids reduction is 38%. For every pound of solids wasted to the digester, 0.73 pounds of solids will need to be disposed of by land application. The average of the waste sludge produced and the remaining digested sludge plus alum sludge generated from phosphorus removal results in Total Solids Disposed per day. In addition, it is assumed that the solids can be thickened to 30,000 mg/l in the digester. At this concentration, a 391,629 cu. ft. digester will hold 732,932 pounds of solids. The capacity of the digester divided by the pounds per day of solids to be disposed of will give the sludge hauling schedule.

Percent of Design Flow	Digested Sludge Production (lb/day)	Avg.Digested Sludge Production (lb/day)	Alum Sludge lbs/day	Total Solids Disposed (lb/day)	Hauling schedule (days)
25	4,412	5,212	388	5,600	131
50	8,824	10,423	776	11,199	65
75	13,236	15,635	1,164	16,799	44
100	17,648	20,846	1,552	22,398	33

ULTIMATE SLUDGE DISPOSAL

Sludge will be liquid hauled from the plant by a TCEQ registered sludge transporter to a TCEQ permitted landfill.

A manifest will be issued with each load of sludge that is hauled from the plant. The following information will be on the manifest to document ultimate disposal of the sludge:

1. Date of sludge hauling
2. Generator Name
3. Generator's address
4. Volume of sludge hauled
5. Name of transporter
6. TCEQ transporter registration number
7. Driver's name
8. Name of disposal site
9. TCEQ Site permit number
10. Date of disposal
11. Volume of sludge disposed

This information, along with laboratory and field data will be used to determine the amount of solids disposed of in dry weight form.

SLUDGE MANAGEMENT AND DISPOSAL PLAN
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JULY 2019

INTRODUCTION

This sludge management and disposal plan is being submitted as an attachment to the TPDES permit amendment application for New Braunfels Utilities South Kuehler Wastewater Treatment Plant.

The final phase for New Braunfels Utilities South Kuehler Wastewater Treatment Plant is a 9.30 MGD single stage nitrification activated sludge plant with effluent limits of 10 mg/l CBOD, 15 mg/l TSS, 3 mg/l NH3-N, and 1.0 mg/l Total Phosphorus. The plant will remove Total Phosphorus by alum precipitation.

DIMENSIONS AND CAPACITIES

Excess solids generated from the activated plant will be wasted to an aerobic digester for further treatment. The liquid stabilized sludge will then be hauled away to a TCEQ permitted land application site for disposal by a licensed sludge hauler. The digester will have a volume of at least 643,629 cu. ft.

SOLIDS GENERATION

Solids to be wasted from the activated sludge process is based on an influent BOD concentration of 310 mg/l and 1.0 pounds of TSS produced per pound of BOD applied. Following is the amount of solids generated by the wastewater treatment plant at design flow and at 75 percent, 50 percent and 25 percent of design flow:

Percent of Design Flow	Flow (MGD)	Waste Sludge Generated (lb/day)
25	3.85	9,954
50	7.70	19,908
75	11.55	29,861
100	15.40	39,815

OPERATING PARAMETERS

The single stage nitrification activated sludge process works best between mixed liquor suspended solids (MLSS) concentrations of 2,000 – 6,000 mg/l. The operator will determine the mixed liquor concentration that produces the highest quality effluent taking into consideration factors such as hydraulic and organic loading, available air capacity, and solids handling. Field testing and laboratory analysis will be done to monitor the MLSS and maintain the appropriate solids concentration.

SOLIDS REMOVAL PROCEDURE

Laboratory analysis and field testing will be conducted to determine the solids concentration in the aeration basin. To maintain an appropriate solids inventory, the amount of solids to be wasted per day is equal to the amount of solids generated per day. This amount is stated in the SOLIDS GENERATION section of this plan. Excess solids will then be wasted from the bottom of the clarifier directly to the aerobic digester to maintain the appropriate solids concentration in the aeration basin.

SOLIDS REMOVAL SCHEDULE

It is assumed that 70% of the solids wasted to the digester are volatile solids and the volatile solids reduction is 38%. For every pound of solids wasted to the digester, 0.73 pounds of solids will need to be disposed of by land application. The average of the waste sludge produced and the remaining digested sludge plus alum sludge generated from phosphorus removal results in Total Solids Disposed per day. In addition, it is assumed that the solids can be thickened to 30,000 mg/l in the digester. At this concentration, a 643,629 cu. ft. digester will hold 1,204,549 pounds of solids. The capacity of the digester divided by the pounds per day of solids to be disposed of will give the sludge hauling schedule.

Percent of Design Flow	Digested Sludge Production (lb/day)	Avg.Digested Sludge Production (lb/day)	Alum Sludge lbs/day	Total Solids Disposed (lb/day)	Hauling schedule (days)
25	7,306	8,630	471	9,101	81
50	14,612	17,260	942	18,201	40
75	21,918	25,890	1,412	27,302	27
100	29,224	34,520	1,883	36,403	20

ULTIMATE SLUDGE DISPOSAL

Sludge will be liquid hauled from the plant by a TCEQ registered sludge transporter to a TCEQ permitted landfill.

A manifest will be issued with each load of sludge that is hauled from the plant. The following information will be on the manifest to document ultimate disposal of the sludge:

1. Date of sludge hauling
2. Generator Name
3. Generator's address
4. Volume of sludge hauled
5. Name of transporter
6. TCEQ transporter registration number
7. Driver's name
8. Name of disposal site
9. TCEQ Site permit number
10. Date of disposal
11. Volume of sludge disposed

This information, along with laboratory and field data will be used to determine the amount of solids disposed of in dry weight form.

ATTACHMENT M

FINAL EFFLUENT ANALYSIS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
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Report of Sample Analysis

Client Information

Trish Soechting
New Braunfels Utilities
P.O. Box 310289
New Braunfels, TX 78131-0289

Sample Information

Project Name: SK WWTP IPP Annual
Sample ID: Eff Grab #1
Matrix: Non-Potable Water
Date/Time Taken: 04/01/2019 1015

Laboratory Information

PCS Sample #: 548260 **Page 1 of 1**
Date/Time Received: 04/02/2019 11:51
Report Date: 04/17/2019
Approved by: Chuck Wallgren
Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #1 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1015	**PCS Sample #: 548261** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren W Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Phenolics	+	See Attached					Pace Analytical Services - Dallas

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POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #2 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1551	**PCS Sample #: 548262** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren cw Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

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POLLUTION CONTROL SERVICES

NELAP ACCREDITED TNI LABORATORY

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #2 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1551	**PCS Sample #: 548263** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren JW Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Phenolics	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

\+ *Subcontract Work - NELAP Certified Lab*

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RL = Reporting Limits

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POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #3 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 2157	**PCS Sample #: 548264** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren cw Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

\+ *Subcontract Work - NELAP Certified Lab*

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RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #3 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 2157	**PCS Sample #: 548265** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren cw Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Phenolics	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

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RL = Reporting Limits

POLLUTION CONTROL SERVICES

NELAP ACCREDITED TNI LABORATORY

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #4 Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0535	**PCS Sample #: 548266** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren

Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

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POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #4 Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0535	**PCS Sample #: 548267** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Phenolics	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

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POLLUTION CONTROL SERVICES

NELAP ACCREDITED TNI LABORATORY

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1015	**PCS Sample #: 548268** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren W Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Volatiles 624	See Attached					Pace Analytical Services - Dallas

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

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POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548269** **Page 1 of 4** Date/Time Received: 04/02/2019 11:51 Report Date: 04/19/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Chloride	172	mg/L	1	04/04/2019 14:51	EPA 300.0	PLP
Nitrate-N	28.8	mg/L	0.1	04/03/2019 04:55	EPA 300.0	PLP
Sulfate	100	mg/L	1	04/04/2019 14:51	EPA 300.0	PLP
Fluoride	0.70	mg/L	0.10	04/03/2019 04:55	EPA 300.0	PLP
Kjeldahl-N, Total	3	mg/L	1	04/18/2019 09:00	SM 4500-N B/E	CRM
Alkalinity, Total	132	mg/L	10	04/03/2019 15:00	SM 2320 B	CRM
Arsenic/ICP MS	0.0006	mg/L	0.0005	04/10/2019 11:15	EPA 200.8	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Chloride	<1	10	92	99	99	102	107	85 - 115
Nitrate-N	<1	20	70	99	99	130	103	85 - 115
Sulfate	2	10	93	98	96	102	108	85 - 115
Fluoride	<1	10	83	98	99	108	102	85 - 115
Kjeldahl-N, Total	<1	10	92	97	97	109	106	85 - 115
Alkalinity, Total	<1	10	95	100	100	107	102	85 - 115
Arsenic/ICP MS	2	20	70	100	99	130	97	85 - 115

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QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548269** **Page 2 of 4** Date/Time Received: 04/02/2019 11:51 Report Date: 04/19/2019

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Barium/ICP (Total)	0.018	mg/L	0.003	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Cadmium/ICP (Total)	<0.001	mg/L	0.001	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Chromium/ICP (Total)	<0.003	mg/L	0.003	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Copper/ICP (Total)	0.008	mg/L	0.002	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Lead/ICP MS	<0.0005	mg/L	0.0005	04/10/2019 11:15	EPA 200.8	DJL
Aluminum/ICP (Total)	0.130	mg/L	0.0025	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Beryllium/ICP (Total)	<0.0005	mg/L	0.0005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Barium/ICP (Total)	1	20	75	96	95	125	110	85 - 115
Cadmium/ICP (Total)	1	20	75	100	99	125	105	85 - 115
Chromium/ICP (Total)	<1	20	75	96	96	125	110	85 - 115
Copper/ICP (Total)	<1	20	75	97	97	125	105	85 - 115
Lead/ICP MS	<1	20	70	108	108	130	106	85 - 115
Aluminum/ICP (Total)	<1	20	75	101	101	125	105	85 - 115
Beryllium/ICP (Total)	<1	20	75	100	100	125	110	85 - 115

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All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548269** **Page 3 of 4** Date/Time Received: 04/02/2019 11:51 Report Date: 04/19/2019

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Molybdenum/ICP (Total)		<0.010	mg/L	0.010	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Hexavalent Chrome	R	<0.003	mg/L	0.003	04/02/2019 16:43	SM 3500-Cr D	DJL
Antimony/ICP (Total)		<0.005	mg/L	0.005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Nickel/ICP (Total)		0.002	mg/L	0.002	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Silver/ICP (Total)		<0.0005	mg/L	0.0005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Zinc/ICP (Total)		0.071	mg/L	0.005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Selenium/ICP (Total)		<0.005	mg/L	0.005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL

	Quality Assurance Summary							
Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Molybdenum/ICP (Total)	1	20	75	100	99	125	105	85 - 115
Hexavalent Chrome	<1	20	75	*55	*55	125	101	85 - 115
Antimony/ICP (Total)	<1	20	75	100	100	125	105	85 - 115
Nickel/ICP (Total)	<1	20	75	92	92	125	105	85 - 115
Silver/ICP (Total)	1	20	75	89	90	125	110	85 - 115
Zinc/ICP (Total)	<1	20	75	95	95	125	105	85 - 115
Selenium/ICP (Total)	<1	20	75	100	100	125	105	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

R *Spike recovery outside control limits due to matrix effect - LCS within limits*
* *Approved for release per QA Plan, Exception to Limits - QAM Section 13-4*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

NELAP ACCREDITED TNI LABORATORY

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548269** **Page 4 of 4** Date/Time Received: 04/02/2019 11:51 Report Date: 04/19/2019

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Thallium/ICP MS	<0.0005	mg/L	0.0005	04/10/2019 11:15	EPA 200.8	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Thallium/ICP MS	<1	20	70	106	107	130	104	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548270** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Pesticides 617	See Attached					Pace Analytical Services - Dallas
604.1 Hexachlorophene	See Attached					Pace Analytical Services - Dallas
Semi Volatiles 625	See Attached					Pace Analytical Services - Dallas
Pesticides 608	See Attached					Pace Analytical Services - Dallas
Pesticides 632	See Attached					Pace Analytical Services - Dallas
Pesticide 1657	See Attached					Pace Analytical Services - Dallas
Herbicides 615	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

POLLUTION CONTROL SERVICES

NELAP ACCREDITED TNI LABORATORY

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548271** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/12/2019 Approved by: Chuck Wallgren CW Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Mercury/CVAFS	<0.000005	mg/L	0.000005	04/05/2019 12:54	EPA 245.7	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Mercury/CVAFS	4	20	70			130		

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Chain of Custody Number
5 4 8 2 6 0

MULTIPLE SAMPLE ANALYSIS REQUEST AND CHAIN OF CUSTODY FORM

Page 1/2

Stamp 1st sample and COC as same number

CUSTOMER INFORMATION	REPORT INFORMATION		
Name: New Braunfels Utilites	Attention: Trish Soechting	Phone: (830) 608-8900	Fax: (830) 626-1361

SAMPLE INFORMATION

Project Information:
IPP SK WWTP Annual
Report "Soils" ☐ As Is ☐ Dry Wt.

Collected By: KM

Requested Analysis

Instructions/Comments:

Client / Field Sample ID	Collected Date	Collected Time	Field Chlorine Residual mg/L	Composite or Grab	Matrix (DW-Drinking Water; NPW-Non-potable water; WW-Wastewater; LW-Liquid Waste)	Container Type	Container Number	Preservative	CN-A335.1	Phenols							PCS Sample Number
Eff Grab #1 04011934	Start: 4-1-19 End:	Start: 1015 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐	X								5 4 8 2 6 0 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #1 04011930	Start: 4-1-19 End:	Start: 1015 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐		X							5 4 8 2 6 1 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #2 04011935	Start: 4-1-19 End:	Start: 1551 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐	X								5 4 8 2 6 2 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #2 04011931	Start: 4-1-19 End:	Start: 1551 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐		X							5 4 8 2 6 3 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #3 04011936	Start: 4-1-19 End:	Start: 2157 End:		☐ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐	X								5 4 8 2 6 4 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #3 04011932	Start: 4-1-19 End:	Start: 2157 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐		X							5 4 8 2 6 5 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #4 04021937	Start: 4-2-19 End:	Start: 0535 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐	X								5 4 8 2 6 6 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #4 04021933	Start: 4-2-19 End:	Start: 0535 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐		X							5 4 8 2 6 7 ☐S ☐B ☐N ☐HEM Other:

Required Turnaround: ☒ Routine (6-10 days) *EXPEDITE:* (See Surcharge Schedule) ☐ < 8 Hrs. ☐ < 16 Hrs. ☐ < 24 Hrs. ☐ 5 days ☐ Other: ________ *Rush Charges Authorized by:*

Sample Archive/Disposal: ☐ Laboratory Standard ☐ Hold for client pick up **Container Type:** P = Plastic, G = Glass, O = Other Carrier ID: ________

Relinquished By:		Date:	4-2-19	Time:	1151	Received By:		Date:	4/2/19	Time:	151
Relinquished By:		Date:		Time:		Received By:		Date:		Time:	

Rev. Multiple Sample COC 20120201

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POLLUTION CONTROL SERVICES

Chain of Custody Number

MULTIPLE SAMPLE ANALYSIS REQUEST AND CHAIN OF CUSTODY FORM

Page 2/2

Stamp 1st sample and COC as same number

CUSTOMER INFORMATION

Name: New Braunfels Utilities

REPORT INFORMATION

Attention: Trish Soechting

Phone: (830) 608-8900

Fax: (830) 626-1361

SAMPLE INFORMATION

Project Information:

IPP SK WWTP Annual

Report "Soils" ☐ As Is ☐ Dry Wt.

Collected By:

Requested Analysis

Instructions/Comments:

Client / Field Sample ID	Collected Date	Collected Time	Field Chlorine Residual mg/L	Composite or Grab	Matrix (DW-Drinking Water; NPW-Non-potable water; WW-Wastewater; LW-Liquid Waste)	Container Type	Container Number	Preservative	VOC 624	Metals Table 3	Hex Cr, F, NO3N	Pest 608, Pest 632	SVOC 625, Herb 615	Hex 604.1, Pest 617, Pest 1657	Hg Low Level		PCS Sample Number
Eff Grab 04011938	Start: 040119 End:	Start: 1015 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐	X								548268 ☐S ☐B ☐N ☐HEM Other:
Eff Grab 04011939	Start: [illegible] End:	Start: 1551 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐	X								☐S ☐B ☐N ☐HEM Other:
Eff Grab 0401940	Start: 4-1-19 End:	Start: 2200 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐	X								☐S ☐B ☐N ☐HEM Other:
Eff Grab 04021941	Start: 4-2-19 End:	Start: 0535 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐	X								☐S ☐B ☐N ☐HEM Other:
Eff Comp 04021942	Start: 4.1.19 End: 4.2.19	Start: 1000 End: 0800		☒ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	2	☐ H_2SO_4 ☒ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐		X	X						548269 ☐S ☐B ☒N ☐HEM Other:
Eff Comp 04021943	Start: 4.1.19 End: 4.2.19	Start: 1000 End: 0800		☒ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	7	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐				X	X	X			548270 ☐S ☐B ☐N ☐HEM Other:
Eff Grab 04021944	Start: 4.1.19 End: 4.2.19	Start: 1000 End: 0800		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	3	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☒ HCL							X		548271 ☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐ C ☐ G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐									☐S ☐B ☐N ☐HEM Other:

Required Turnaround: ☒ Routine (6-10 days) *EXPEDITE:* (See Surcharge Schedule) ☐ < 8 Hrs. ☐ < 16 Hrs. ☐ < 24 Hrs. ☐ 5 days ☐ Other: ________ *Rush Charges Authorized by:*

Sample Archive/Disposal: ☐ Laboratory Standard ☐ Hold for client pick up **Container Type:** P = Plastic, G = Glass, O = Other Carrier ID:

Relinquished By:		Date:	4.2.19	Time:	1151	Received By:		Date:	4/2/19	Time:	1151
Relinquished By:		Date:		Time:		Received By:		Date:		Time:	

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Allen, TX 75013
(972)727-1123

April 17, 2019

Chuck Wallgren
Pollution Control Services
1532 Universal City Blvd. #100
Universal City, TX 78148

RE: Project: 548260
Pace Project No.: 75105824

Dear Chuck Wallgren:

Enclosed are the analytical results for sample(s) received by the laboratory on April 03, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Melissa Mc Cullough

Melissa McCullough
melissa.mccullough@pacelabs.com
(972)727-1123
Project Manager

Enclosures

cc: Michael Klang

CERTIFICATIONS

Project:	548260
Pace Project No.:	75105824

Dallas Certification IDs:

400 West Bethany Dr Suite 190, Allen, TX 75013
Florida Certification #: E871118
EPA# TX00074
Texas T104704232-18-26
Texas Certification #: T104704232-18-26

Kansas Certification #: E-10388
Arkansas Certification #: 88-0647
Oklahoma Certification #: 8727
Louisiana Certification #: 30686
Iowa Certification #: 408

SAMPLE SUMMARY

Project: 548260
Pace Project No.: 75105824

Lab ID	Sample ID	Matrix	Date Collected	Date Received
75105824001	548260	Water	04/01/19 10:15	04/03/19 10:50
75105824002	548261	Water	04/01/19 10:15	04/03/19 10:50
75105824003	548262	Water	04/01/19 15:51	04/03/19 10:50
75105824004	548263	Water	04/01/19 15:51	04/03/19 10:50
75105824005	548264	Water	04/01/19 21:57	04/03/19 10:50
75105824006	548265	Water	04/01/19 21:57	04/03/19 10:50
75105824007	548266	Water	04/02/19 05:35	04/03/19 10:50
75105824008	548267	Water	04/02/19 05:35	04/03/19 10:50
75105824009	548268	Water	04/01/19 10:15	04/03/19 10:50
75105824010	548270	Water	04/02/19 08:00	04/03/19 10:50

SAMPLE ANALYTE COUNT

Project: 548260
Pace Project No.: 75105824

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
75105824001	**548260**	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D
75105824003	**548262**	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D
75105824005	**548264**	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D
75105824007	**548266**	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D
75105824009	**548268**	EPA 624 Low	NSR	37	PASI-D
75105824010	**548270**	EPA 608	JL	28	PASI-D
		EPA 615	DAT	3	PASI-D
		EPA 604.1	XLY	2	PASI-D
		EPA 632	XLY	3	PASI-D
		EPA 625	XLY	69	PASI-D

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548260 **Lab ID: 75105824001** Collected: 04/01/19 10:15 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C								
Cyanide	ND	ug/L	10.0	4.0	1	04/12/19 12:27	04/12/19 15:46	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C								
Amenable Cyanide	ND	ug/L	10.0	4.0	1	04/15/19 08:38	04/15/19 08:39	57-12-5	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548262 **Lab ID: 75105824003** Collected: 04/01/19 15:51 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C								
Cyanide	ND	ug/L	10.0	4.0	1	04/12/19 12:27	04/12/19 15:48	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C								
Amenable Cyanide	ND	ug/L	10.0	4.0	1	04/15/19 08:38	04/15/19 08:39	57-12-5	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548264 **Lab ID: 75105824005** Collected: 04/01/19 21:57 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C								
Cyanide	ND	ug/L	10.0	4.0	1	04/12/19 12:27	04/12/19 15:48	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C								
Amenable Cyanide	ND	ug/L	10.0	4.0	1	04/15/19 08:38	04/15/19 08:39	57-12-5	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548266 **Lab ID: 75105824007** Collected: 04/02/19 05:35 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C								
Cyanide	ND	ug/L	10.0	4.0	1	04/12/19 12:27	04/12/19 15:48	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C								
Amenable Cyanide	ND	ug/L	10.0	4.0	1	04/15/19 08:38	04/15/19 08:39	57-12-5	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548268 **Lab ID: 75105824009** Collected: 04/01/19 10:15 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
624 Volatile Organics	Analytical Method: EPA 624 Low								
Acrolein	ND	ug/L	50.0	7.9	1		04/03/19 23:24	107-02-8	
Acrylonitrile	ND	ug/L	50.0	6.0	1		04/03/19 23:24	107-13-1	
Benzene	ND	ug/L	10.0	0.49	1		04/03/19 23:24	71-43-2	
Bromoform	ND	ug/L	10.0	7.5	1		04/03/19 23:24	75-25-2	
Carbon tetrachloride	ND	ug/L	2.0	1.1	1		04/03/19 23:24	56-23-5	
Chlorobenzene	ND	ug/L	10.0	0.37	1		04/03/19 23:24	108-90-7	
Dibromochloromethane	ND	ug/L	10.0	0.40	1		04/03/19 23:24	124-48-1	
Chloroethane	ND	ug/L	50.0	0.95	1		04/03/19 23:24	75-00-3	
2-Chloroethylvinyl ether	ND	ug/L	10.0	3.2	1		04/03/19 23:24	110-75-8	
Chloroform	**34.2**	ug/L	10.0	1.2	1		04/03/19 23:24	67-66-3	
Bromodichloromethane	**18.5**	ug/L	10.0	0.50	1		04/03/19 23:24	75-27-4	
1,1-Dichloroethane	ND	ug/L	5.0	1.2	1		04/03/19 23:24	75-34-3	
1,4-Dichlorobenzene	ND	ug/L	10.0	0.40	1		04/03/19 23:24	106-46-7	
1,3-Dichlorobenzene	ND	ug/L	10.0	0.43	1		04/03/19 23:24	541-73-1	
1,2-Dichlorobenzene	ND	ug/L	10.0	0.37	1		04/03/19 23:24	95-50-1	
1,2-Dibromoethane (EDB)	ND	ug/L	10.0	0.45	1		04/03/19 23:24	106-93-4	
1,2-Dichloroethane	ND	ug/L	10.0	1.1	1		04/03/19 23:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	10.0	1.1	1		04/03/19 23:24	75-35-4	
1,2-Dichloropropane	ND	ug/L	10.0	0.49	1		04/03/19 23:24	78-87-5	
Total 1,3-Dichloropropene	ND	ug/L	10.0	3.7	1		04/03/19 23:24	542-75-6	N2
Ethylbenzene	ND	ug/L	10.0	0.46	1		04/03/19 23:24	100-41-4	
Bromomethane	ND	ug/L	50.0	1.2	1		04/03/19 23:24	74-83-9	
Chloromethane	ND	ug/L	50.0	1.1	1		04/03/19 23:24	74-87-3	
2-Butanone (MEK)	ND	ug/L	50.0	4.9	1		04/03/19 23:24	78-93-3	L2
Methylene Chloride	ND	ug/L	20.0	10.0	1		04/03/19 23:24	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	1.5	1		04/03/19 23:24	79-34-5	
Tetrachloroethene	ND	ug/L	10.0	1.5	1		04/03/19 23:24	127-18-4	
Toluene	ND	ug/L	10.0	1.3	1		04/03/19 23:24	108-88-3	
trans-1,2-Dichloroethene	ND	ug/L	10.0	1.2	1		04/03/19 23:24	156-60-5	
1,1,1-Trichloroethane	ND	ug/L	10.0	0.69	1		04/03/19 23:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	10.0	1.3	1		04/03/19 23:24	79-00-5	
Trichloroethene	ND	ug/L	10.0	0.60	1		04/03/19 23:24	79-01-6	
Vinyl chloride	ND	ug/L	10.0	0.93	1		04/03/19 23:24	75-01-4	
Total Trihalomethanes (Calc.)	**59.9**	ug/L	10.0	3.4	1		04/03/19 23:24		
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		1		04/03/19 23:24	460-00-4	
Toluene-d8 (S)	99	%	70-130		1		04/03/19 23:24	2037-26-5	
1,2-Dichloroethane-d4 (S)	108	%	70-130		1		04/03/19 23:24	17060-07-0	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548270 Lab ID: **75105824010** Collected: 04/02/19 08:00 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
608SF GCS Pesticides and PCBs	Analytical Method: EPA 608 Preparation Method: EPA 608 SF								
Aldrin	ND	ug/L	0.010	0.0071	1	04/09/19 11:15	04/10/19 12:32	309-00-2	
alpha-BHC	ND	ug/L	0.051	0.0061	1	04/09/19 11:15	04/10/19 12:32	319-84-6	
beta-BHC	ND	ug/L	0.051	0.011	1	04/09/19 11:15	04/10/19 12:32	319-85-7	
gamma-BHC (Lindane)	ND	ug/L	0.051	0.0051	1	04/09/19 11:15	04/10/19 12:32	58-89-9	
delta-BHC	ND	ug/L	0.051	0.0041	1	04/09/19 11:15	04/10/19 12:32	319-86-8	
Chlordane (Technical)	ND	ug/L	0.20	0.042	1	04/09/19 11:15	04/10/19 12:32	57-74-9	
4,4'-DDT	ND	ug/L	0.020	0.0051	1	04/09/19 11:15	04/10/19 12:32	50-29-3	
4,4'-DDE	ND	ug/L	0.10	0.0041	1	04/09/19 11:15	04/10/19 12:32	72-55-9	
4,4'-DDD	ND	ug/L	0.10	0.0061	1	04/09/19 11:15	04/10/19 12:32	72-54-8	
Dieldrin	ND	ug/L	0.020	0.0041	1	04/09/19 11:15	04/10/19 12:32	60-57-1	
Endosulfan I	ND	ug/L	0.010	0.0041	1	04/09/19 11:15	04/10/19 12:32	959-98-8	
Endosulfan II	ND	ug/L	0.020	0.0041	1	04/09/19 11:15	04/10/19 12:32	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.10	0.0041	1	04/09/19 11:15	04/10/19 12:32	1031-07-8	
Endrin	ND	ug/L	0.020	0.0041	1	04/09/19 11:15	04/10/19 12:32	72-20-8	
Endrin aldehyde	ND	ug/L	0.10	0.012	1	04/09/19 11:15	04/10/19 12:32	7421-93-4	
Heptachlor	ND	ug/L	0.010	0.0061	1	04/09/19 11:15	04/10/19 12:32	76-44-8	
Heptachlor epoxide	ND	ug/L	0.010	0.0041	1	04/09/19 11:15	04/10/19 12:32	1024-57-3	
Toxaphene	ND	ug/L	0.31	0.21	1	04/09/19 11:15	04/10/19 12:32	8001-35-2	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.20	0.11	1	04/09/19 11:15	04/10/19 12:32	53469-21-9	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.20	0.088	1	04/09/19 11:15	04/10/19 12:32	11097-69-1	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.20	0.14	1	04/09/19 11:15	04/10/19 12:32	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.20	0.18	1	04/09/19 11:15	04/10/19 12:32	11141-16-5	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.20	0.073	1	04/09/19 11:15	04/10/19 12:32	12672-29-6	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.20	0.15	1	04/09/19 11:15	04/10/19 12:32	11096-82-5	
PCB-1016 (Aroclor 1016)	ND	ug/L	0.20	0.12	1	04/09/19 11:15	04/10/19 12:32	12674-11-2	
PCB, Total	ND	ug/L	0.20	0.18	1	04/09/19 11:15	04/10/19 12:32	1336-36-3	
Surrogates									
Tetrachloro-m-xylene (S)	69	%.	47-135		1	04/09/19 11:15	04/10/19 12:32	877-09-8	
Decachlorobiphenyl (S)	87	%.	16-161		1	04/09/19 11:15	04/10/19 12:32	2051-24-3	
615 Chlorinated Herbicides	Analytical Method: EPA 615 Preparation Method: EPA 615								
2,4-D	ND	ug/L	0.70	0.18	1	04/09/19 22:30	04/15/19 15:48	94-75-7	
2,4,5-TP (Silvex)	ND	ug/L	0.30	0.16	1	04/09/19 22:30	04/15/19 15:48	93-72-1	
Surrogates									
2,4-DCAA (S)	53	%.	44-137		1	04/09/19 22:30	04/15/19 15:48	19719-28-9	
604.1 HPLC Hexachlorophene	Analytical Method: EPA 604.1 Preparation Method: EPA 604.1								
Hexachlorophene	ND	ug/L	10.0	3.2	1	04/09/19 14:05	04/11/19 06:31	70-30-4	N3
Surrogates									
Nitrobenzene (S)	48	%.	25-108		1	04/09/19 14:05	04/11/19 06:31		
632 HPLC Carbamates	Analytical Method: EPA 632 Preparation Method: EPA 632								
Carbaryl	ND	ug/L	4.0	0.61	1	04/09/19 14:05	04/11/19 06:31	63-25-2	
Diuron	ND	ug/L	0.080	0.020	1	04/09/19 14:05	04/11/19 06:31	330-54-1	N2
Surrogates									
Nitrobenzene (S)	48	%.	18-113		1	04/09/19 14:05	04/11/19 06:31		

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548270 **Lab ID: 75105824010** Collected: 04/02/19 08:00 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
625 MSSV	Analytical Method: EPA 625 Preparation Method: EPA 625								
Nonylphenol	ND	ug/L	333	2.9	1	04/05/19 09:10	04/06/19 21:49	25154-52-3	N2
2-Chlorophenol	ND	ug/L	10.0	0.82	1	04/05/19 09:10	04/06/19 21:49	95-57-8	
2,4-Dichlorophenol	ND	ug/L	10.0	0.82	1	04/05/19 09:10	04/06/19 21:49	120-83-2	
Cresols (Total)	ND	ug/L	10.0	1.5	1	04/05/19 09:10	04/06/19 21:49	1319-77-3	N2
2,4-Dimethylphenol	ND	ug/L	10.0	1.4	1	04/05/19 09:10	04/06/19 21:49	105-67-9	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.0	1.5	1	04/05/19 09:10	04/06/19 21:49	534-52-1	
2,4-Dinitrophenol	ND	ug/L	50.0	1.1	1	04/05/19 09:10	04/06/19 21:49	51-28-5	
2-Nitrophenol	ND	ug/L	20.0	1.7	1	04/05/19 09:10	04/06/19 21:49	88-75-5	
4-Nitrophenol	ND	ug/L	50.0	1.6	1	04/05/19 09:10	04/06/19 21:49	100-02-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.0	0.77	1	04/05/19 09:10	04/06/19 21:49		
4-Chloro-3-methylphenol	ND	ug/L	10.0	0.87	1	04/05/19 09:10	04/06/19 21:49	59-50-7	
Pentachlorophenol	ND	ug/L	5.0	2.1	1	04/05/19 09:10	04/06/19 21:49	87-86-5	
Phenol	ND	ug/L	10.0	0.97	1	04/05/19 09:10	04/06/19 21:49	108-95-2	
2,4,5-Trichlorophenol	ND	ug/L	50.0	1.9	1	04/05/19 09:10	04/06/19 21:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/L	10.0	1.8	1	04/05/19 09:10	04/06/19 21:49	88-06-2	
Acenaphthene	ND	ug/L	10.0	1.3	1	04/05/19 09:10	04/06/19 21:49	83-32-9	
Acenaphthylene	ND	ug/L	10.0	1.3	1	04/05/19 09:10	04/06/19 21:49	208-96-8	
Anthracene	ND	ug/L	10.0	1.1	1	04/05/19 09:10	04/06/19 21:49	120-12-7	
Benzidine	ND	ug/L	50.0	3.1	1	04/05/19 09:10	04/06/19 21:49	92-87-5	
Benzo(a)anthracene	ND	ug/L	5.0	0.93	1	04/05/19 09:10	04/06/19 21:49	56-55-3	
Benzo(a)pyrene	ND	ug/L	5.0	0.94	1	04/05/19 09:10	04/06/19 21:49	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	10.0	1.0	1	04/05/19 09:10	04/06/19 21:49	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	20.0	1.0	1	04/05/19 09:10	04/06/19 21:49	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	2.5	0.93	1	04/05/19 09:10	04/06/19 21:49	207-08-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.0	0.99	1	04/05/19 09:10	04/06/19 21:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	10.0	1.0	1	04/05/19 09:10	04/06/19 21:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/L	2.5	1.2	1	04/05/19 09:10	04/06/19 21:49	108-60-1	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.0	3.2	1	04/05/19 09:10	04/06/19 21:49	117-81-7	
4-Bromophenylphenyl ether	ND	ug/L	10.0	1.0	1	04/05/19 09:10	04/06/19 21:49	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.0	1.4	1	04/05/19 09:10	04/06/19 21:49	85-68-7	
2-Chloronaphthalene	ND	ug/L	10.0	1.4	1	04/05/19 09:10	04/06/19 21:49	91-58-7	
4-Chlorophenylphenyl ether	ND	ug/L	10.0	1.4	1	04/05/19 09:10	04/06/19 21:49	7005-72-3	
Chrysene	ND	ug/L	5.0	1.0	1	04/05/19 09:10	04/06/19 21:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	5.0	1.1	1	04/05/19 09:10	04/06/19 21:49	53-70-3	
3,3'-Dichlorobenzidine	ND	ug/L	5.0	2.7	1	04/05/19 09:10	04/06/19 21:49	91-94-1	
Diethylphthalate	ND	ug/L	10.0	0.92	1	04/05/19 09:10	04/06/19 21:49	84-66-2	
Dimethylphthalate	ND	ug/L	10.0	0.88	1	04/05/19 09:10	04/06/19 21:49	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.0	1.2	1	04/05/19 09:10	04/06/19 21:49	84-74-2	
2,4-Dinitrotoluene	ND	ug/L	10.0	2.7	1	04/05/19 09:10	04/06/19 21:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/L	10.0	1.8	1	04/05/19 09:10	04/06/19 21:49	606-20-2	
Di-n-octylphthalate	ND	ug/L	10.0	1.7	1	04/05/19 09:10	04/06/19 21:49	117-84-0	
1,2-Diphenylhydrazine	ND	ug/L	20.0	1.2	1	04/05/19 09:10	04/06/19 21:49	122-66-7	
Fluoranthene	ND	ug/L	10.0	1.1	1	04/05/19 09:10	04/06/19 21:49	206-44-0	
Fluorene	ND	ug/L	10.0	1.3	1	04/05/19 09:10	04/06/19 21:49	86-73-7	
Hexachlorobenzene	ND	ug/L	5.0	0.97	1	04/05/19 09:10	04/06/19 21:49	118-74-1	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1.8	1	04/05/19 09:10	04/06/19 21:49	87-68-3	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548270 **Lab ID: 75105824010** Collected: 04/02/19 08:00 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
625 MSSV	Analytical Method: EPA 625 Preparation Method: EPA 625								
Hexachlorocyclopentadiene	ND	ug/L	10.0	1.2	1	04/05/19 09:10	04/06/19 21:49	77-47-4	
Hexachloroethane	ND	ug/L	20.0	1.9	1	04/05/19 09:10	04/06/19 21:49	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/L	5.0	0.98	1	04/05/19 09:10	04/06/19 21:49	193-39-5	
Isophorone	ND	ug/L	10.0	1.8	1	04/05/19 09:10	04/06/19 21:49	78-59-1	
Naphthalene	ND	ug/L	10.0	2.0	1	04/05/19 09:10	04/06/19 21:49	91-20-3	
Nitrobenzene	ND	ug/L	10.0	1.2	1	04/05/19 09:10	04/06/19 21:49	98-95-3	
N-Nitrosodiethylamine	ND	ug/L	20.0	0.93	1	04/05/19 09:10	04/06/19 21:49	55-18-5	
N-Nitrosodimethylamine	ND	ug/L	50.0	0.65	1	04/05/19 09:10	04/06/19 21:49	62-75-9	
N-Nitroso-di-n-butylamine	ND	ug/L	20.0	0.74	1	04/05/19 09:10	04/06/19 21:49	924-16-3	
N-Nitroso-di-n-propylamine	ND	ug/L	20.0	1.1	1	04/05/19 09:10	04/06/19 21:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	20.0	0.83	1	04/05/19 09:10	04/06/19 21:49	86-30-6	
Phenanthrene	ND	ug/L	10.0	1.1	1	04/05/19 09:10	04/06/19 21:49	85-01-8	
Pentachlorobenzene	ND	ug/L	20.0	1.3	1	04/05/19 09:10	04/06/19 21:49	608-93-5	
Pyrene	ND	ug/L	10.0	1.2	1	04/05/19 09:10	04/06/19 21:49	129-00-0	
Pyridine	ND	ug/L	20.0	1.2	1	04/05/19 09:10	04/06/19 21:49	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	1.6	1	04/05/19 09:10	04/06/19 21:49	120-82-1	
1,2,4,5-Tetrachlorobenzene	ND	ug/L	20.0	1.3	1	04/05/19 09:10	04/06/19 21:49	95-94-3	
Surrogates									
Nitrobenzene-d5 (S)	67	%.	15-106		1	04/05/19 09:10	04/06/19 21:49	4165-60-0	
2-Fluorobiphenyl (S)	69	%.	26-102		1	04/05/19 09:10	04/06/19 21:49	321-60-8	
p-Terphenyl-d14 (S)	92	%.	10-120		1	04/05/19 09:10	04/06/19 21:49	1718-51-0	
Phenol-d6 (S)	28	%.	10-54		1	04/05/19 09:10	04/06/19 21:49	13127-88-3	
2-Fluorophenol (S)	38	%.	10-66		1	04/05/19 09:10	04/06/19 21:49	367-12-4	
2,4,6-Tribromophenol (S)	90	%.	29-132		1	04/05/19 09:10	04/06/19 21:49	118-79-6	

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115157
QC Batch Method: EPA 624 Low
Associated Lab Samples: 75105824009

Analysis Method: EPA 624 Low
Analysis Description: 624 MSV

METHOD BLANK: 518445
Matrix: Water
Associated Lab Samples: 75105824009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	10.0	0.69	04/03/19 11:54	
1,1,2,2-Tetrachloroethane	ug/L	ND	10.0	1.5	04/03/19 11:54	
1,1,2-Trichloroethane	ug/L	ND	10.0	1.3	04/03/19 11:54	
1,1-Dichloroethane	ug/L	ND	5.0	1.2	04/03/19 11:54	
1,1-Dichloroethene	ug/L	ND	10.0	1.1	04/03/19 11:54	
1,2-Dibromoethane (EDB)	ug/L	ND	10.0	0.45	04/03/19 11:54	
1,2-Dichlorobenzene	ug/L	ND	10.0	0.37	04/03/19 11:54	
1,2-Dichloroethane	ug/L	ND	10.0	1.1	04/03/19 11:54	
1,2-Dichloropropane	ug/L	ND	10.0	0.49	04/03/19 11:54	
1,3-Dichlorobenzene	ug/L	ND	10.0	0.43	04/03/19 11:54	
1,4-Dichlorobenzene	ug/L	ND	10.0	0.40	04/03/19 11:54	
2-Butanone (MEK)	ug/L	ND	50.0	4.9	04/03/19 11:54	
2-Chloroethylvinyl ether	ug/L	ND	10.0	3.2	04/03/19 11:54	
Acrolein	ug/L	ND	50.0	7.9	04/03/19 11:54	
Acrylonitrile	ug/L	ND	50.0	6.0	04/03/19 11:54	
Benzene	ug/L	ND	10.0	0.49	04/03/19 11:54	
Bromodichloromethane	ug/L	ND	10.0	0.50	04/03/19 11:54	
Bromoform	ug/L	ND	10.0	7.5	04/03/19 11:54	
Bromomethane	ug/L	ND	50.0	1.2	04/03/19 11:54	
Carbon tetrachloride	ug/L	ND	2.0	1.1	04/03/19 11:54	
Chlorobenzene	ug/L	ND	10.0	0.37	04/03/19 11:54	
Chloroethane	ug/L	ND	50.0	0.95	04/03/19 11:54	
Chloroform	ug/L	ND	10.0	1.2	04/03/19 11:54	
Chloromethane	ug/L	ND	50.0	1.1	04/03/19 11:54	
Dibromochloromethane	ug/L	ND	10.0	0.40	04/03/19 11:54	
Ethylbenzene	ug/L	ND	10.0	0.46	04/03/19 11:54	
Methylene Chloride	ug/L	ND	20.0	10.0	04/03/19 11:54	
Tetrachloroethene	ug/L	ND	10.0	1.5	04/03/19 11:54	
Toluene	ug/L	ND	10.0	1.3	04/03/19 11:54	
Total 1,3-Dichloropropene	ug/L	ND	10.0	3.7	04/03/19 11:54	N2
Total Trihalomethanes (Calc.)	ug/L	ND	10.0	3.4	04/03/19 11:54	
trans-1,2-Dichloroethene	ug/L	ND	10.0	1.2	04/03/19 11:54	
Trichloroethene	ug/L	ND	10.0	0.60	04/03/19 11:54	
Vinyl chloride	ug/L	ND	10.0	0.93	04/03/19 11:54	
1,2-Dichloroethane-d4 (S)	%.	103	70-130		04/03/19 11:54	
4-Bromofluorobenzene (S)	%.	103	70-130		04/03/19 11:54	
Toluene-d8 (S)	%.	99	70-130		04/03/19 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

LABORATORY CONTROL SAMPLE: 518446

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	19.9	21.5	108	52-162	
1,1,2,2-Tetrachloroethane	ug/L	20.1	17.1	85	46-157	
1,1,2-Trichloroethane	ug/L	19.9	18.5	93	52-150	
1,1-Dichloroethane	ug/L	20	20.3	101	59-155	
1,1-Dichloroethene	ug/L	19.8	22.0	111	1-234	
1,2-Dibromoethane (EDB)	ug/L	20	18.5	92	81-118	
1,2-Dichlorobenzene	ug/L	20	19.8	99	18-190	
1,2-Dichloroethane	ug/L	19.9	18.5	93	49-155	
1,2-Dichloropropane	ug/L	19.9	20.9	105	76-124	
1,3-Dichlorobenzene	ug/L	19.9	21.0	105	59-156	
1,4-Dichlorobenzene	ug/L	20	21.0	105	18-190	
2-Butanone (MEK)	ug/L	101	57.0	57	60-130	L2
2-Chloroethylvinyl ether	ug/L	20.1	15.8	78	1-305	
Acrolein	ug/L	200	120	60	49-138	
Acrylonitrile	ug/L	199	150	76	57-137	
Benzene	ug/L	20	21.7	108	37-151	
Bromodichloromethane	ug/L	19.9	19.9	100	35-155	
Bromoform	ug/L	19.8	18.2	92	45-169	
Bromomethane	ug/L	20	19.1J	95	1-242	
Carbon tetrachloride	ug/L	19.8	21.8	110	70-140	
Chlorobenzene	ug/L	19.8	20.7	104	37-160	
Chloroethane	ug/L	20.1	20.7J	103	14-230	
Chloroform	ug/L	19.8	19.6	99	51-138	
Chloromethane	ug/L	19.9	19.5J	98	1-273	
Dibromochloromethane	ug/L	19.8	18.4	93	53-149	
Ethylbenzene	ug/L	20.1	21.8	109	37-162	
Methylene Chloride	ug/L	20.4	19.8J	97	1-221	
Tetrachloroethene	ug/L	19.9	21.2	106	64-148	
Toluene	ug/L	20	21.3	106	47-150	
Total 1,3-Dichloropropene	ug/L	40.1	38.1	95	70-130	N2
Total Trihalomethanes (Calc.)	ug/L		76.1			
trans-1,2-Dichloroethene	ug/L	20	20.8	104	54-156	
Trichloroethene	ug/L	20	21.2	106	71-157	
Vinyl chloride	ug/L	20	20.5	102	1-251	
1,2-Dichloroethane-d4 (S)	%.			93	70-130	
4-Bromofluorobenzene (S)	%.			104	70-130	
Toluene-d8 (S)	%.			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 518447 518448

Parameter	Units	75105729002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	ND	1990	1990	2210	2100	111	106	52-162	5	20	
1,1,2,2-Tetrachloroethane	ug/L	ND	2010	2010	1940	1920	96	96	46-157	1	20	
1,1,2-Trichloroethane	ug/L	ND	1990	1990	2050	1990	103	100	52-150	3	20	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 518447 518448

Parameter	Units	75105729002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1-Dichloroethane	ug/L	ND	2000	2000	2080	1960	104	98	59-155	6	20	
1,1-Dichloroethene	ug/L	ND	1980	1980	2330	2170	118	110	1-234	7	20	
1,2-Dibromoethane (EDB)	ug/L	ND	2000	2000	2000	1970	100	98	77-122	2	20	
1,2-Dichlorobenzene	ug/L	ND	2000	2000	1980	1940	99	97	18-190	2	20	
1,2-Dichloroethane	ug/L	ND	1990	1990	1990	1900	100	96	49-155	4	20	
1,2-Dichloropropane	ug/L	ND	1990	1990	2130	2030	107	102	1-210	5	20	
1,3-Dichlorobenzene	ug/L	ND	1990	1990	1980	1910	99	96	59-156	4	20	
1,4-Dichlorobenzene	ug/L	ND	2000	2000	1990	1930	99	96	18-190	3	20	
2-Butanone (MEK)	ug/L	ND	10100	10100	10000	10600	100	105	62-131	5	20	
2-Chloroethylvinyl ether	ug/L	ND	2010	2010	1700	1710	84	85	40-140	1	20	
Acrolein	ug/L	ND	20000	20000	10300	9300	52	46	10-140	11	20	
Acrylonitrile	ug/L	ND	19900	19900	21400	21600	107	108	10-140	1	20	
Benzene	ug/L	ND	2000	2000	2200	2070	110	103	37-151	6	20	
Bromodichloromethane	ug/L	ND	1990	1990	1970	1890	99	95	35-155	4	20	
Bromoform	ug/L	ND	1980	1980	1890	1890	96	95	45-169	0	20	
Bromomethane	ug/L	ND	2000	2000	1460	1440	73	72	1-242	2	20	
Carbon tetrachloride	ug/L	ND	1980	1980	2210	2090	111	105	70-140	6	20	
Chlorobenzene	ug/L	ND	1980	1980	2030	1950	102	98	37-160	4	20	
Chloroethane	ug/L	ND	2010	2010	2230	2070	111	103	14-230	8	20	
Chloroform	ug/L	ND	1980	1980	2020	1920	102	97	51-138	5	20	
Chloromethane	ug/L	ND	1990	1990	2130	1970	107	99	10-273	7	20	
Dibromochloromethane	ug/L	ND	1980	1980	1860	1830	94	93	53-149	2	20	
Ethylbenzene	ug/L	ND	2010	2010	2180	2050	109	102	37-162	6	20	
Methylene Chloride	ug/L	ND	2040	2040	1980	1880	94	89	1-221		20	
Tetrachloroethene	ug/L	ND	1990	1990	2120	2030	106	102	64-148	4	20	
Toluene	ug/L	ND	2000	2000	2100	2000	105	100	47-150	5	20	
Total 1,3-Dichloropropene	ug/L	ND	4010	4010	3740	3660	93	91	70-130	2	20	N2
Total Trihalomethanes (Calc.)	ug/L	ND			7740	7540				3	20	
trans-1,2-Dichloroethene	ug/L	ND	2000	2000	2180	2030	109	102	54-156	7	20	
Trichloroethene	ug/L	ND	2000	2000	2170	2050	109	102	71-157	6	20	
Vinyl chloride	ug/L	ND	2000	2000	2260	2080	113	104	1-251	8	20	
1,2-Dichloroethane-d4 (S)	%.						103	103	70-130			
4-Bromofluorobenzene (S)	%.						100	101	70-130			
Toluene-d8 (S)	%.						100	101	70-130			

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115494
QC Batch Method: EPA 604.1
Associated Lab Samples: 75105824010

Analysis Method: EPA 604.1
Analysis Description: 604.1 HPLC Hexachlorophene

METHOD BLANK: 520111
Matrix: Water
Associated Lab Samples: 75105824010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Hexachlorophene	ug/L	ND	10.0	3.2	04/11/19 00:15	N3
Nitrobenzene (S)	%.	73	25-108		04/11/19 00:15	

LABORATORY CONTROL SAMPLE: 520112

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Hexachlorophene	ug/L	50	30.3	61	28-123	N3
Nitrobenzene (S)	%.			76	25-108	

MATRIX SPIKE SAMPLE: 520118

Parameter	Units	75105824010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Hexachlorophene	ug/L	ND	50	33.3	67	22-130	N3
Nitrobenzene (S)	%.				70	25-108	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115478
QC Batch Method: EPA 608 SF
Associated Lab Samples: 75105824010
Analysis Method: EPA 608
Analysis Description: 608 GCS Pest PCB

METHOD BLANK: 520023
Matrix: Water
Associated Lab Samples: 75105824010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	0.0060	04/10/19 11:34	
4,4'-DDE	ug/L	ND	0.10	0.0040	04/10/19 11:34	
4,4'-DDT	ug/L	ND	0.020	0.0050	04/10/19 11:34	
Aldrin	ug/L	ND	0.010	0.0070	04/10/19 11:34	
alpha-BHC	ug/L	ND	0.050	0.0060	04/10/19 11:34	
beta-BHC	ug/L	ND	0.050	0.011	04/10/19 11:34	
Chlordane (Technical)	ug/L	ND	0.20	0.041	04/10/19 11:34	
delta-BHC	ug/L	ND	0.050	0.0040	04/10/19 11:34	
Dieldrin	ug/L	ND	0.020	0.0040	04/10/19 11:34	
Endosulfan I	ug/L	ND	0.010	0.0040	04/10/19 11:34	
Endosulfan II	ug/L	ND	0.020	0.0040	04/10/19 11:34	
Endosulfan sulfate	ug/L	ND	0.10	0.0040	04/10/19 11:34	
Endrin	ug/L	ND	0.020	0.0040	04/10/19 11:34	
Endrin aldehyde	ug/L	ND	0.10	0.012	04/10/19 11:34	
gamma-BHC (Lindane)	ug/L	ND	0.050	0.0050	04/10/19 11:34	
Heptachlor	ug/L	ND	0.010	0.0060	04/10/19 11:34	
Heptachlor epoxide	ug/L	ND	0.010	0.0040	04/10/19 11:34	
PCB-1016 (Aroclor 1016)	ug/L	ND	0.20	0.12	04/10/19 11:34	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.20	0.13	04/10/19 11:34	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.20	0.18	04/10/19 11:34	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.20	0.11	04/10/19 11:34	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.20	0.072	04/10/19 11:34	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.20	0.086	04/10/19 11:34	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.20	0.14	04/10/19 11:34	
Toxaphene	ug/L	ND	0.30	0.21	04/10/19 11:34	
Decachlorobiphenyl (S)	%.	73	16-161		04/10/19 11:34	
Tetrachloro-m-xylene (S)	%.	84	47-135		04/10/19 11:34	

LABORATORY CONTROL SAMPLE: 520024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/L	0.5	0.53	106	31-141	
4,4'-DDE	ug/L	0.5	0.50	101	30-145	
4,4'-DDT	ug/L	0.5	0.51	101	10-160	
Aldrin	ug/L	0.5	0.45	89	42-142	
alpha-BHC	ug/L	0.5	0.51	101	37-134	
beta-BHC	ug/L	0.5	0.48	96	17-147	
delta-BHC	ug/L	0.5	0.40	81	19-140	
Dieldrin	ug/L	0.5	0.49	98	36-146	
Endosulfan I	ug/L	0.5	0.48	96	45-153	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

LABORATORY CONTROL SAMPLE: 520024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endosulfan II	ug/L	0.5	0.50	100	40-140	
Endosulfan sulfate	ug/L	0.5	0.48	96	26-144	
Endrin	ug/L	0.5	0.50	101	30-147	
Endrin aldehyde	ug/L	0.5	0.48	97	40-140	
gamma-BHC (Lindane)	ug/L	0.5	0.51	102	32-127	
Heptachlor	ug/L	0.5	0.45	90	34-141	
Heptachlor epoxide	ug/L	0.5	0.48	95	25-142	
Decachlorobiphenyl (S)	%.			71	16-161	
Tetrachloro-m-xylene (S)	%.			88	47-135	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 520025 520026

Parameter	Units	75106002001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
4,4'-DDD	ug/L	ND	0.5	0.5	0.56	0.54	111	109	24-177	2	40	
4,4'-DDE	ug/L	ND	0.5	0.5	0.47	0.47	95	94	22-161	1	40	
4,4'-DDT	ug/L	ND	0.5	0.5	0.53	0.53	106	105	10-180	1	40	
Aldrin	ug/L	ND	0.5	0.5	0.45	0.44	89	89	10-156	1	40	
alpha-BHC	ug/L	ND	0.5	0.5	0.50	0.51	100	102	71-143	2	40	
beta-BHC	ug/L	ND	0.5	0.5	0.50	0.47	99	95	72-149	5	40	
delta-BHC	ug/L	ND	0.5	0.5	0.42	0.41	85	83	44-151	2	40	
Dieldrin	ug/L	ND	0.5	0.5	0.55	0.54	110	108	33-166	2	40	
Endosulfan I	ug/L	ND	0.5	0.5	0.48	0.48	97	97	27-167	0	40	
Endosulfan II	ug/L	ND	0.5	0.5	0.52	0.51	104	102	37-173	2	40	
Endosulfan sulfate	ug/L	ND	0.5	0.5	0.52	0.51	104	101	33-167	3	40	
Endrin	ug/L	ND	0.5	0.5	0.53	0.52	107	105	39-173	2	40	
Endrin aldehyde	ug/L	ND	0.5	0.5	0.55	0.53	109	105	14-180	4	40	
gamma-BHC (Lindane)	ug/L	ND	0.5	0.5	0.53	0.52	107	105	69-139	2	40	
Heptachlor	ug/L	ND	0.5	0.5	0.46	0.46	93	91	48-141	2	40	
Heptachlor epoxide	ug/L	ND	0.5	0.5	0.49	0.48	98	96	28-164	2	40	
Decachlorobiphenyl (S)	%.						85	85	16-161			
Tetrachloro-m-xylene (S)	%.						84	87	47-135			

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115532
QC Batch Method: EPA 615
Associated Lab Samples: 75105824010

Analysis Method: EPA 615
Analysis Description: 615 GCS Herbicides

METHOD BLANK: 520324
Associated Lab Samples: 75105824010

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
2,4,5-TP (Silvex)	ug/L	ND	0.30	0.15	04/15/19 11:32	
2,4-D	ug/L	ND	0.70	0.17	04/15/19 11:32	
2,4-DCAA (S)	%.	45	44-137		04/15/19 11:32	

LABORATORY CONTROL SAMPLE: 520325

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-TP (Silvex)	ug/L	3	2.6	85	57-125	
2,4-D	ug/L	3	2.5	83	49-133	
2,4-DCAA (S)	%.			53	44-137	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 520326 520327

Parameter	Units	75106015001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
2,4,5-TP (Silvex)	ug/L	ND	3.1	3.1	2.8	2.7	90	89	44-134	2	40	
2,4-D	ug/L	ND	3.1	3.1	2.6	2.4	85	80	49-145	7	40	
2,4-DCAA (S)	%.						60	56	44-137			

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115297
QC Batch Method: EPA 625
Associated Lab Samples: 75105824010

Analysis Method: EPA 625
Analysis Description: 625 MSS

METHOD BLANK: 519256
Associated Lab Samples: 75105824010

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4,5-Tetrachlorobenzene	ug/L	ND	20.0	1.3	04/06/19 13:45	
1,2,4-Trichlorobenzene	ug/L	ND	10.0	1.6	04/06/19 13:45	
1,2-Diphenylhydrazine	ug/L	ND	20.0	1.2	04/06/19 13:45	
2,4,5-Trichlorophenol	ug/L	ND	50.0	1.9	04/06/19 13:45	
2,4,6-Trichlorophenol	ug/L	ND	10.0	1.8	04/06/19 13:45	
2,4-Dichlorophenol	ug/L	ND	10.0	0.82	04/06/19 13:45	
2,4-Dimethylphenol	ug/L	ND	10.0	1.4	04/06/19 13:45	
2,4-Dinitrophenol	ug/L	ND	50.0	1.1	04/06/19 13:45	
2,4-Dinitrotoluene	ug/L	ND	10.0	2.7	04/06/19 13:45	
2,6-Dinitrotoluene	ug/L	ND	10.0	1.8	04/06/19 13:45	
2-Chloronaphthalene	ug/L	ND	10.0	1.4	04/06/19 13:45	
2-Chlorophenol	ug/L	ND	10.0	0.82	04/06/19 13:45	
2-Nitrophenol	ug/L	ND	20.0	1.7	04/06/19 13:45	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	10.0	0.77	04/06/19 13:45	
3,3'-Dichlorobenzidine	ug/L	ND	5.0	2.7	04/06/19 13:45	
4,6-Dinitro-2-methylphenol	ug/L	ND	10.0	1.5	04/06/19 13:45	
4-Bromophenylphenyl ether	ug/L	ND	10.0	1.0	04/06/19 13:45	
4-Chloro-3-methylphenol	ug/L	ND	10.0	0.87	04/06/19 13:45	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	1.4	04/06/19 13:45	
4-Nitrophenol	ug/L	ND	50.0	1.6	04/06/19 13:45	
Acenaphthene	ug/L	ND	10.0	1.3	04/06/19 13:45	
Acenaphthylene	ug/L	ND	10.0	1.3	04/06/19 13:45	
Anthracene	ug/L	ND	10.0	1.1	04/06/19 13:45	
Benzidine	ug/L	ND	50.0	3.1	04/06/19 13:45	
Benzo(a)anthracene	ug/L	ND	5.0	0.93	04/06/19 13:45	
Benzo(a)pyrene	ug/L	ND	5.0	0.94	04/06/19 13:45	
Benzo(b)fluoranthene	ug/L	ND	10.0	1.0	04/06/19 13:45	
Benzo(g,h,i)perylene	ug/L	ND	20.0	1.0	04/06/19 13:45	
Benzo(k)fluoranthene	ug/L	ND	2.5	0.93	04/06/19 13:45	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	0.99	04/06/19 13:45	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	1.0	04/06/19 13:45	
bis(2-Chloroisopropyl) ether	ug/L	ND	2.5	1.2	04/06/19 13:45	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	3.2	04/06/19 13:45	
Butylbenzylphthalate	ug/L	ND	10.0	1.4	04/06/19 13:45	
Chrysene	ug/L	ND	5.0	1.0	04/06/19 13:45	
Cresols (Total)	ug/L	ND	10.0	1.5	04/06/19 13:45	N2
Di-n-butylphthalate	ug/L	ND	10.0	1.2	04/06/19 13:45	
Di-n-octylphthalate	ug/L	ND	10.0	1.7	04/06/19 13:45	
Dibenz(a,h)anthracene	ug/L	ND	5.0	1.1	04/06/19 13:45	
Diethylphthalate	ug/L	ND	10.0	0.92	04/06/19 13:45	
Dimethylphthalate	ug/L	ND	10.0	0.88	04/06/19 13:45	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

METHOD BLANK: 519256 Matrix: Water
Associated Lab Samples: 75105824010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoranthene	ug/L	ND	10.0	1.1	04/06/19 13:45	
Fluorene	ug/L	ND	10.0	1.3	04/06/19 13:45	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	1.8	04/06/19 13:45	
Hexachlorobenzene	ug/L	ND	5.0	0.97	04/06/19 13:45	
Hexachlorocyclopentadiene	ug/L	ND	10.0	1.2	04/06/19 13:45	
Hexachloroethane	ug/L	ND	20.0	1.9	04/06/19 13:45	
Indeno(1,2,3-cd)pyrene	ug/L	ND	5.0	0.98	04/06/19 13:45	
Isophorone	ug/L	ND	10.0	1.8	04/06/19 13:45	
N-Nitroso-di-n-butylamine	ug/L	ND	20.0	0.74	04/06/19 13:45	
N-Nitroso-di-n-propylamine	ug/L	ND	20.0	1.1	04/06/19 13:45	
N-Nitrosodiethylamine	ug/L	ND	20.0	0.93	04/06/19 13:45	
N-Nitrosodimethylamine	ug/L	ND	50.0	0.65	04/06/19 13:45	
N-Nitrosodiphenylamine	ug/L	ND	20.0	0.83	04/06/19 13:45	
Naphthalene	ug/L	ND	10.0	2.0	04/06/19 13:45	
Nitrobenzene	ug/L	ND	10.0	1.2	04/06/19 13:45	
Nonylphenol	ug/L	ND	333	2.9	04/06/19 13:45	N2
Pentachlorobenzene	ug/L	ND	20.0	1.3	04/06/19 13:45	
Pentachlorophenol	ug/L	ND	5.0	2.1	04/06/19 13:45	
Phenanthrene	ug/L	ND	10.0	1.1	04/06/19 13:45	
Phenol	ug/L	ND	10.0	0.97	04/06/19 13:45	
Pyrene	ug/L	ND	10.0	1.2	04/06/19 13:45	
Pyridine	ug/L	ND	20.0	1.2	04/06/19 13:45	
2,4,6-Tribromophenol (S)	%.	84	29-132		04/06/19 13:45	
2-Fluorobiphenyl (S)	%.	102	26-102		04/06/19 13:45	
2-Fluorophenol (S)	%.	53	10-66		04/06/19 13:45	
Nitrobenzene-d5 (S)	%.	97	15-106		04/06/19 13:45	
p-Terphenyl-d14 (S)	%.	122	10-120		04/06/19 13:45	S3
Phenol-d6 (S)	%.	41	10-54		04/06/19 13:45	

LABORATORY CONTROL SAMPLE: 519257

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4,5-Tetrachlorobenzene	ug/L	50	45.5	91	35-108	
1,2,4-Trichlorobenzene	ug/L	50	43.9	88	44-142	
1,2-Diphenylhydrazine	ug/L	50	47.7	95	62-114	
2,4,5-Trichlorophenol	ug/L	50	50.9	102	60-118	
2,4,6-Trichlorophenol	ug/L	50	49.7	99	37-144	
2,4-Dichlorophenol	ug/L	50	47.1	94	39-135	
2,4-Dimethylphenol	ug/L	50	34.5	69	32-119	
2,4-Dinitrophenol	ug/L	50	44.9J	90	1-191	
2,4-Dinitrotoluene	ug/L	50	52.9	106	39-139	
2,6-Dinitrotoluene	ug/L	50	52.2	104	50-158	
2-Chloronaphthalene	ug/L	50	48.5	97	60-118	
2-Chlorophenol	ug/L	50	42.9	86	23-134	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

LABORATORY CONTROL SAMPLE: 519257

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Nitrophenol	ug/L	50	50.7	101	29-182	
3&4-Methylphenol(m&p Cresol)	ug/L	50	38.8	78	33-110	
3,3'-Dichlorobenzidine	ug/L	100	112	112	1-262	
4,6-Dinitro-2-methylphenol	ug/L	50	48.2	96	1-181	
4-Bromophenylphenyl ether	ug/L	50	48.2	96	53-127	
4-Chloro-3-methylphenol	ug/L	50	49.5	99	22-147	
4-Chlorophenylphenyl ether	ug/L	50	48.7	97	25-158	
4-Nitrophenol	ug/L	50	36.3J	73	1-132	
Acenaphthene	ug/L	50	46.2	92	47-145	
Acenaphthylene	ug/L	50	47.5	95	33-145	
Anthracene	ug/L	50	48.1	96	27-133	
Benzidine	ug/L	100	81.6	82	10-140	
Benzo(a)anthracene	ug/L	50	44.5	89	33-143	
Benzo(a)pyrene	ug/L	50	49.5	99	17-163	
Benzo(b)fluoranthene	ug/L	50	51.2	102	24-159	
Benzo(g,h,i)perylene	ug/L	50	52.9	106	1-219	
Benzo(k)fluoranthene	ug/L	50	48.5	97	11-162	
bis(2-Chloroethoxy)methane	ug/L	50	45.4	91	33-184	
bis(2-Chloroethyl) ether	ug/L	50	43.8	88	12-158	
bis(2-Chloroisopropyl) ether	ug/L	50	42.9	86	36-166	
bis(2-Ethylhexyl)phthalate	ug/L	50	50.6	101	8-158	
Butylbenzylphthalate	ug/L	50	48.1	96	1-152	
Chrysene	ug/L	50	47.2	94	17-168	
Cresols (Total)	ug/L	100	78.7	79	36-110	N2
Di-n-butylphthalate	ug/L	50	49.4	99	1-118	
Di-n-octylphthalate	ug/L	50	53.2	106	4-146	
Dibenz(a,h)anthracene	ug/L	50	54.0	108	1-227	
Diethylphthalate	ug/L	50	49.7	99	1-114	
Dimethylphthalate	ug/L	50	49.7	99	1-112	
Fluoranthene	ug/L	50	50.4	101	26-137	
Fluorene	ug/L	50	48.2	96	59-121	
Hexachloro-1,3-butadiene	ug/L	50	44.5	89	24-116	
Hexachlorobenzene	ug/L	50	48.4	97	1-152	
Hexachlorocyclopentadiene	ug/L	50	47.8	96	12-121	
Hexachloroethane	ug/L	50	40.1	80	40-113	
Indeno(1,2,3-cd)pyrene	ug/L	50	53.7	107	1-171	
Isophorone	ug/L	50	48.1	96	21-196	
N-Nitroso-di-n-butylamine	ug/L	50	48.4	97	49-117	
N-Nitroso-di-n-propylamine	ug/L	50	46.4	93	1-230	
N-Nitrosodiethylamine	ug/L	50	43.9	88	40-140	
N-Nitrosodimethylamine	ug/L	50	29.3J	59	26-77	
N-Nitrosodiphenylamine	ug/L	50	52.0	104	67-115	
Naphthalene	ug/L	50	44.2	88	21-133	
Nitrobenzene	ug/L	50	45.7	91	35-180	
Nonylphenol	ug/L	50	47.3J	95	57-136	N2
Pentachlorobenzene	ug/L	50	48.0	96	40-140	
Pentachlorophenol	ug/L	50	31.8	64	14-176	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

LABORATORY CONTROL SAMPLE: 519257

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phenanthrene	ug/L	50	47.5	95	54-120	
Phenol	ug/L	50	20.4	41	5-112	
Pyrene	ug/L	50	50.5	101	52-115	
Pyridine	ug/L	50	23.9	48	12-110	
2,4,6-Tribromophenol (S)	%.			105	29-132	
2-Fluorobiphenyl (S)	%.			97	26-102	
2-Fluorophenol (S)	%.			57	10-66	
Nitrobenzene-d5 (S)	%.			93	15-106	
p-Terphenyl-d14 (S)	%.			100	10-120	
Phenol-d6 (S)	%.			44	10-54	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 519258 519259

Parameter	Units	75105745001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4,5-Tetrachlorobenzene	ug/L	ND	49.5	50	40.1	37.5	81	75	37-105	6	40	
1,2,4-Trichlorobenzene	ug/L	ND	49.5	50	38.8	35.8	78	72	44-142	8	40	
1,2-Diphenylhydrazine	ug/L	ND	49.5	50	45.0	43.9	91	88	43-124	2	40	
2,4,5-Trichlorophenol	ug/L	ND	49.5	50	48.1J	46.3J	97	93	50-121	4	40	
2,4,6-Trichlorophenol	ug/L	ND	49.5	50	47.4	45.0	96	90	37-144	5	40	
2,4-Dichlorophenol	ug/L	ND	49.5	50	45.1	41.7	91	83	39-135	8	40	
2,4-Dimethylphenol	ug/L	ND	49.5	50	42.4	39.4	86	79	32-119	7	40	
2,4-Dinitrophenol	ug/L	ND	49.5	50	48.5J	44.9J	98	90	1-191	8	40	
2,4-Dinitrotoluene	ug/L	ND	49.5	50	51.4	50.5	104	101	39-139	2	40	
2,6-Dinitrotoluene	ug/L	ND	49.5	50	49.7	48.0	100	96	50-158	4	40	
2-Chloronaphthalene	ug/L	ND	49.5	50	43.8	38.0	88	76	60-118	14	40	
2-Chlorophenol	ug/L	ND	49.5	50	39.8	36.9	80	74	23-134	7	40	
2-Nitrophenol	ug/L	ND	49.5	50	48.0	44.8	97	90	29-182	7	40	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	49.5	50	37.7	34.3	76	69	10-105	9	40	
3,3'-Dichlorobenzidine	ug/L	ND	99	100	40.3	36.4	41	36	1-262	10	40	
4,6-Dinitro-2-methylphenol	ug/L	ND	49.5	50	49.1	48.3	99	97	1-181	2	40	
4-Bromophenylphenyl ether	ug/L	ND	49.5	50	44.9	43.5	91	87	53-127	3	40	
4-Chloro-3-methylphenol	ug/L	ND	49.5	50	49.3	47.2	100	94	22-147	4	40	
4-Chlorophenylphenyl ether	ug/L	ND	49.5	50	45.8	44.0	92	88	25-158	4	40	
4-Nitrophenol	ug/L	ND	49.5	50	37.4J	35.1J	76	70	1-132	6	40	
Acenaphthene	ug/L	ND	49.5	50	42.7	40.8	86	82	47-145	4	40	
Acenaphthylene	ug/L	ND	49.5	50	43.3	40.9	87	82	33-145	6	40	
Anthracene	ug/L	ND	49.5	50	44.6	44.0	90	88	27-133	1	40	
Benzidine	ug/L	ND	99	100	3.9J	3.4J	4	3	10-74		40	M1
Benzo(a)anthracene	ug/L	ND	49.5	50	42.1	40.9	85	82	33-143	3	40	
Benzo(a)pyrene	ug/L	ND	49.5	50	44.5	43.8	90	88	17-163	2	40	
Benzo(b)fluoranthene	ug/L	ND	49.5	50	46.1	45.1	93	90	24-159	2	40	
Benzo(g,h,i)perylene	ug/L	ND	49.5	50	52.4	52.4	106	105	1-219	0	40	
Benzo(k)fluoranthene	ug/L	ND	49.5	50	43.7	43.5	88	87	11-162	0	40	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 519258 519259

Parameter	Units	75105745001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
bis(2-Chloroethoxy)methane	ug/L	ND	49.5	50	42.4	39.4	86	79	33-184	7	40	
bis(2-Chloroethyl) ether	ug/L	ND	49.5	50	42.0	39.2	85	78	12-158	7	40	
bis(2-Chloroisopropyl) ether	ug/L	ND	49.5	50	40.2	37.3	81	75	36-166	7	40	
bis(2-Ethylhexyl)phthalate	ug/L	ND	49.5	50	48.8	48.1	99	96	8-158	2	40	
Butylbenzylphthalate	ug/L	ND	49.5	50	46.5	45.9	94	92	1-152	1	40	
Chrysene	ug/L	ND	49.5	50	44.3	43.6	89	87	17-168	2	40	
Cresols (Total)	ug/L	ND	99	100	77.0	70.1	78	70	10-118	9	40	N2
Di-n-butylphthalate	ug/L	ND	49.5	50	48.5	47.0	98	94	1-118	3	40	
Di-n-octylphthalate	ug/L	ND	49.5	50	51.3	51.0	104	102	4-146	0	40	
Dibenz(a,h)anthracene	ug/L	ND	49.5	50	52.7	52.7	107	105	1-227	0	40	
Diethylphthalate	ug/L	ND	49.5	50	48.8	47.5	99	95	1-114	3	40	
Dimethylphthalate	ug/L	ND	49.5	50	47.6	45.3	96	91	1-112	5	40	
Fluoranthene	ug/L	ND	49.5	50	47.5	46.5	96	93	26-137	2	40	
Fluorene	ug/L	ND	49.5	50	45.2	43.6	91	87	59-121	4	40	
Hexachloro-1,3-butadiene	ug/L	ND	49.5	50	39.0	35.9	79	72	24-116	8	40	
Hexachlorobenzene	ug/L	ND	49.5	50	45.3	43.5	92	87	1-152	4	40	
Hexachlorocyclopentadiene	ug/L	ND	49.5	50	37.0	32.1	75	64	10-123	14	40	
Hexachloroethane	ug/L	ND	49.5	50	35.1	33.1	71	66	40-113	6	40	
Indeno(1,2,3-cd)pyrene	ug/L	ND	49.5	50	52.8	52.5	107	105	1-171	0	40	
Isophorone	ug/L	ND	49.5	50	45.8	42.5	93	85	21-196	8	40	
N-Nitroso-di-n-butylamine	ug/L	ND	49.5	50	47.0	43.8	95	88	41-119	7	40	
N-Nitroso-di-n-propylamine	ug/L	ND	49.5	50	44.2	40.7	89	81	1-230	8	40	
N-Nitrosodiethylamine	ug/L	ND	49.5	50	42.7	39.5	86	79	25-126	8	40	
N-Nitrosodimethylamine	ug/L	ND	49.5	50	28.1J	25.2J	57	50	14-77	11	40	
N-Nitrosodiphenylamine	ug/L	ND	49.5	50	49.6	49.0	100	98	35-131	1	40	
Naphthalene	ug/L	ND	49.5	50	43.6	41.3	88	83	21-133	5	40	
Nitrobenzene	ug/L	ND	49.5	50	50.9	49.4	103	99	35-180	3	40	
Nonylphenol	ug/L	ND	49.5	50	46.7J	45.2J	94	90	37-142	3	40	N2
Pentachlorobenzene	ug/L	ND	49.5	50	44.5	42.2	90	84	48-111	5	40	
Pentachlorophenol	ug/L	ND	49.5	50	42.0	41.2	85	82	14-176	2	40	
Phenanthrene	ug/L	ND	49.5	50	44.0	43.2	89	86	54-120	2	40	
Phenol	ug/L	ND	49.5	50	20.4	18.1	41	36	5-112	12	40	
Pyrene	ug/L	ND	49.5	50	46.7	45.6	94	91	52-115	2	40	
Pyridine	ug/L	ND	49.5	50	20.7	19.2J	42	38	10-69	8	40	
2,4,6-Tribromophenol (S)	%.						103	102	29-132			
2-Fluorobiphenyl (S)	%.						83	79	26-102			
2-Fluorophenol (S)	%.						51	47	10-66			
Nitrobenzene-d5 (S)	%.						82	78	15-106			
p-Terphenyl-d14 (S)	%.						93	94	10-120			
Phenol-d6 (S)	%.						40	37	10-54			

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115496
QC Batch Method: EPA 632
Associated Lab Samples: 75105824010

Analysis Method: EPA 632
Analysis Description: 632 HPLC Carbamates

METHOD BLANK: 520122
Associated Lab Samples: 75105824010

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Carbaryl	ug/L	ND	4.0	0.61	04/11/19 00:15	
Diuron	ug/L	ND	0.080	0.020	04/11/19 00:15	N2
Nitrobenzene (S)	%.	73	18-113		04/11/19 00:15	

LABORATORY CONTROL SAMPLE: 520123

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbaryl	ug/L	10	10	100	59-119	
Diuron	ug/L	5	4.5	90	61-114	N2
Nitrobenzene (S)	%.			76	18-113	

MATRIX SPIKE SAMPLE: 520124

Parameter	Units	75105824010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Carbaryl	ug/L	ND	10	9.1	91	45-139	
Diuron	ug/L	ND	5	4.6	92	54-127	N2
Nitrobenzene (S)	%.				70	18-113	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115682
Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-C
Analysis Description: 4500CNE Cyanide, Total
Associated Lab Samples: 75105824001, 75105824003, 75105824005, 75105824007

METHOD BLANK: 521009
Matrix: Water
Associated Lab Samples: 75105824001, 75105824003, 75105824005, 75105824007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	4.0	04/12/19 15:43	

LABORATORY CONTROL SAMPLE: 521010

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	100	104	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 521011 521012

Parameter	Units	75105934001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	100	100	ND	ND	0	0	85-115		20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 521013 521014

Parameter	Units	75105824007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	100	100	88.3	103	88	103	85-115	15	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115814
Analysis Method: SM 4500-CN-G
QC Batch Method: SM 4500-CN-C
Analysis Description: 4500CNG Cyanide, Amenable
Associated Lab Samples: 75105824001, 75105824003, 75105824005, 75105824007

METHOD BLANK: 521767
Matrix: Water
Associated Lab Samples: 75105824001, 75105824003, 75105824005, 75105824007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Amenable Cyanide	ug/L	ND	10.0	4.0	04/15/19 08:39	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALIFIERS

Project:	548260
Pace Project No.:	75105824

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The Nelac Institute

LABORATORIES

PASI-D	Pace Analytical Services - Dallas

ANALYTE QUALIFIERS

L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
S3	Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated sample.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 548260
Pace Project No.: 75105824

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
75105824010	548270	EPA 608 SF	115478	EPA 608	115547
75105824010	548270	EPA 615	115532	EPA 615	115834
75105824010	548270	EPA 604.1	115494	EPA 604.1	115692
75105824010	548270	EPA 632	115496	EPA 632	115560
75105824010	548270	EPA 625	115297	EPA 625	115354
75105824009	548268	EPA 624 Low	115157		
75105824001	548260	SM 4500-CN-C	115682	SM 4500-CN-E	115778
75105824003	548262	SM 4500-CN-C	115682	SM 4500-CN-E	115778
75105824005	548264	SM 4500-CN-C	115682	SM 4500-CN-E	115778
75105824007	548266	SM 4500-CN-C	115682	SM 4500-CN-E	115778
75105824001	548260	SM 4500-CN-C	115814	SM 4500-CN-G	115815
75105824003	548262	SM 4500-CN-C	115814	SM 4500-CN-G	115815
75105824005	548264	SM 4500-CN-C	115814	SM 4500-CN-G	115815
75105824007	548266	SM 4500-CN-C	115814	SM 4500-CN-G	115815

Pace Analytical®	Document Name: Sample Condition Upon Receipt	Document Revised: 03-14-19 Page 1 of 1
	Document No.: F-DAL-C-001-rev.9	Issuing Authority: Pace Dallas Quality Office

Sample Condition Upon Receipt

☑Dallas ☐Ft Worth

WO# : 75105824
75105824

Client Name: DCS Project Work order: _

Courier: FedEX ☐ UPS ☐ USPS ☐ Client ☐ LSO ☑ PACE ☐ Other: ____

Tracking #: ZY00NAVJ

Custody Seal on Cooler/Box: Yes ☐ No ☑ **Packing Material:** Bubble Wrap/Bags ☑ Foam ☐ None ☐ Other ☐

Received on ice: Yes ☑ No ☐ **Type of Ice:** Wet ☑ Blue ☐

Thermometer Used: IR-11 **Cooler Temp °C:** 1.4 (Recorded) 0 (Correction Factor) 1.4 (Actual)

Temperature should be above freezing to 6°C

Chain of Custody relinquished	Yes ☑ No ☐
Sampler name & signature on COC	Yes ☐ No ☑
Short HT analyses (<72 hrs)	Yes ☑ No ☐
Sufficient Volume received	Yes ☑ No ☐
Correct Container used	Yes ☑ No ☐
Container Intact	Yes ☑ No ☐
Sample pH Acceptable pH Strips: 141031 Residual Chlorine Present Cl Strips: ~~[illegible]~~ mg 4.3.19 141364 Sulfide Present Lead Acetate Strips: 141365	Yes ☑ No ☐ NA ☐ Yes ☑ No ☐ NA ☐ Yes ☑ No ☐ NA ☐
Are soil samples (volatiles, TPH) received in 5035A Kits	Yes ☐ No ☐ NA ☑
Unpreserved 5035A soil frozen within 48 hrs	Yes ☐ No ☐ NA ☑
Headspace in VOA (>6mm)	Yes ☐ No ☑ NA ☐
Project sampled in USDA Regulated Area: State Sampled: TX	Yes ☑ No ☐
Non-Conformance(s):	Yes ☐ No ☑

POLLUTION CONTROL SERVICES
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318
Facsimilie 210.658.7903
210.340.0343

CHAIN OF CUSTODY & SUBCONTRACT TRACKING SHEET

TO: Pace Analytical Services, Inc.
400 W Bethany Rd, Ste 190
Allen, TX 75013

Relinquished by: Greg Felux
Date/Time: 4/2/2019 @ 1700
Received by: /Pace
Date/Time: 4/3/19 1050 3.3 IR-11

PCS#	Date	Time	Analysis Requested	Pres	T. A. T.
548260	04/01/2019	1015	Cyanide, Amenable	NAOH	Std
548261	04/01/2019	1015	Phenolics	H2SO4	Std
548262	04/01/2019	1551	Cyanide, Amenable	NAOH	Std
548263	04/01/2019	1551	Phenolics	H2SO4	Std
548264	04/01/2019	2157	Cyanide, Amenable	NAOH	Std
548265	04/01/2019	2157	Phenolics	H2SO4	Std
548266	04/02/2019	0535	Cyanide, Amenable	NAOH	Std
548267	04/02/2019	0535	Phenolics	H2SO4	Std
548268	04/01/2019	1015	Volatiles 624	ICE	Std
548270	04/02/2019	0800	604.1 Hexachlorophene	ICE	STD

Comments/Special Instructions:

WO#: 75105824
PM: MLM Due Date: 04/17/19
CLIENT: PCS

Unless otherwise requested, send results and invoice to:

Chuck Wallgren
Pollution Control Services
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318

Authorized by: Date: 4/2/19

over

POLLUTION CONTROL SERVICES

1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318
Facsimilie 210.658.7903
210.340.0343

CHAIN OF CUSTODY & SUBCONTRACT TRACKING SHEET

TO: Pace Analytical Services, Inc.
400 W Bethany Rd, Ste 190
Allen, TX 75013

Relinquished by: Greg Felux
Date/Time: 4/2/2019 @ 1700
Received by:
Date/Time:

PCS#	Date	Time	Analysis Requested	Pres	T. A. T.
548270	----------	----	Semi Volatiles 625	ICE	----
548270	----------	----	Herbicides 615		----
548270	----------	----	Pesticide 1657		----
548270	----------	----	Pesticides 608		----
548270	----------	----	Pesticides 617		----
548270	----------	----	Pesticides 632	ICE	---

Comments/Special Instructions:

Unless otherwise requested, send results and invoice to:

Chuck Wallgren
Pollution Control Services
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318

WO#: 75105824
PM: MLM Due Date: 04/17/19
CLIENT: PCS

Authorized by:

Date: 4/2/19

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663
Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com
Employee Owned Integrity Caring Continual Improvement

Results

Printed: 04/16/2019 14:43

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75105824

Account	*Project*
PAMM-N	**869294**

Report To

Pace Analytical - Dallas
Melissa McCullough
400 West Bethany Drive
Suite 190
Allen, TX 75013

Results

1773045 75105824002 *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007
Taken: 04/01/2019 10:15:00

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 833090 04/12/2019 11:20:00 MLC

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	**Phenolics, Total Recoverable**	<0.005	mg/L	0.005			02

1773046 75105824004 *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007
Taken: 04/01/2019 15:51:00

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 833090 04/12/2019 11:22:00 MLC

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	**Phenolics, Total Recoverable**	<0.005	mg/L	0.005			02

1773047 75105824006 *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007
Taken: 04/01/2019 21:57:00

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 833090 04/12/2019 11:25:00 MLC

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	**Phenolics, Total Recoverable**	<0.005	mg/L	0.005			02

1773048 75105824008 *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007
Taken: 04/02/2019 05:35:00

NELAP-accredited #T104704201-19-15

Results

Printed: 04/16/2019 14:43

1773048 **75105824008** *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007

Taken: 04/02/2019 05:35:00

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 833090 04/12/2019 11:27:00 *MLC*

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	**Phenolics, Total Recoverable**	<0.005	mg/L	0.005			02

1773049 **75105824010** *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007

Taken: 04/02/2019 08:00:00

EPA 1657 *Prepared:* 832001 04/08/2019 08:00:00 *Analyzed* 832472 04/09/2019 20:51:00 *EMT*

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
Z	**Azinphos-methyl (Guthion)**	<0.0513	ug/L	0.0513	X	86-50-0	04
Z	**Chlorpyrifos**	<0.041	ug/L	0.041	X	2921-88-2	04
Z	**Demeton**	<0.0513	ug/L	0.0513	X	8065-48-3	04
Z	**Diazinon**	<0.050	ug/L	0.050	X	333-41-5	04
Z	**Malathion**	<0.0513	ug/L	0.0513	X	121-75-5	04
Z	**Parathion, ethyl**	<0.0513	ug/L	0.0513	X	56-38-2	04
Z	**Parathion, methyl**	<0.041	ug/L	0.041	X	298-00-0	04

EPA 617 *Prepared:* 831994 04/08/2019 08:00:00 *Analyzed* 832836 04/10/2019 20:50:00 *EMT*

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
Z	**Kelthane (Dicofol)**	<0.041	ug/L	0.041	X	115-32-2	03
Z	**Methoxychlor**	<0.0103	ug/L	0.0103	X	72-43-5	03
Z	**Mirex**	<0.0103	ug/L	0.0103		2385-85-5	03

Sample Preparation

1773045 **75105824002** *Received:* 04/05/2019

DASUB2007

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 832149 04/09/2019 10:00:00 *CRS*

N	**Phenol Distillation**	50/50	ml	01

Results

Printed: 04/16/2019 14:43

1773046 75105824004 *Received:* 04/05/2019

DASUB2007

EPA 420.4 1 *Prepared:* *832149* *04/09/2019* *10:00:00* *Analyzed* *832149* *04/09/2019* *10:00:00* *CRS*

N **Phenol Distillation**	50/50	ml	01

1773047 75105824006 *Received:* 04/05/2019

DASUB2007

EPA 420.4 1 *Prepared:* *832149* *04/09/2019* *10:00:00* *Analyzed* *832149* *04/09/2019* *10:00:00* *CRS*

N **Phenol Distillation**	50/50	ml	01

1773048 75105824008 *Received:* 04/05/2019

DASUB2007

EPA 420.4 1 *Prepared:* *832149* *04/09/2019* *10:00:00* *Analyzed* *832149* *04/09/2019* *10:00:00* *CRS*

N **Phenol Distillation**	50/50	ml	01

1773049 75105824010 *Received:* 04/05/2019

DASUB2007

EPA 1657 *Prepared:* *832001* *04/08/2019* *08:00:00* *Analyzed* *832472* *04/09/2019* *20:51:00* *EMT*

Organophos. Pesticides	Entered		04

EPA 614/608/617/1657 *Prepared:* *831994* *04/08/2019* *08:00:00* *Analyzed* *831994* *04/08/2019* *08:00:00* *SJN*

Liquid-Liquid Extr. W/Hex Ex	1/975	ml	02

Results

Printed: 04/16/2019 14:43

1773049 **75105824010**

Received: 04/05/2019

DASUB2007

	EPA 614/608/617/1657	*Prepared:*	*832001*	*04/08/2019*	*08:00:00*	*Analyzed*	*832001*	*04/08/2019*	*08:00:00*	*SJN*
	Solvent Extraction	1/975	**ml**						02	
	EPA 617	*Prepared:*	*831994*	*04/08/2019*	*08:00:00*	*Analyzed*	*832836*	*04/10/2019*	*20:50:00*	*EMT*
z	**Dicofol/Methoxychlor/Mirex**	**Entered**							03	

Qualifiers:

X - Standard reads higher than desired.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-19-15, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.

These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Bill Peery

Bill Peery, MS, VP Technical Services

Ethics Service Quality ACIL 2005 SEAL OF EXCELLENCE PROGRAM Environmental

ANA-LAB CORP. THE COMPLETE SERVICE LAB

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663

Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com LELAP-accredited #02008

Employee Owned Integrity Caring Continual Improvement

Quality Control

Printed 04/16/2019

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Report To

Pace Analytical - Dallas
Melissa McCullough
400 West Bethany Drive
Suite 190
Allen, TX 75013

Account	*Project*
PAMM-N	869294

Analytical Set 833090 EPA 420.4 1

Blank

Parameter	*PrepSet*	*Reading*	*MDL*	*MQL*	*Units*	*File*
Phenolics, Total Recoverable	832149	ND	0.00377	0.005	mg/L	119824625

CCV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Phenolics, Total Recoverable	0.196	0.200	mg/L	98.0	90.0 - 110	119824624
	0.198	0.200	mg/L	99.0	90.0 - 110	119824635
	0.191	0.200	mg/L	95.5	90.0 - 110	119824646

Duplicate

Parameter	*Sample*	*Result*	*Unknown*	*Unit*	*RPD*	*Limit%*
Phenolics, Total Recoverable	1772654	ND	ND	mg/L		20.0
	1772947	0.160	0.161	mg/L	0.623	20.0

ICV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Phenolics, Total Recoverable	0.200	0.200	mg/L	100	90.0 - 110	119824623

LCS Dup

Parameter	*PrepSet*	*LCS*	*LCSD*	*Known*	*Limits%*	*LCS%*	*LCSD%*	*Units*	*RPD*	*Limit%*
Phenolics, Total Recoverable	832149	0.201	0.206	0.200	90.0 - 110	100	103	mg/L	2.46	20.0

Mat. Spike

Parameter	*Sample*	*Spike*	*Unknown*	*Known*	*Units*	*Recovery %*	*Limits %*	*File*
Phenolics, Total Recoverable	1772654	0.195	ND	0.200	mg/L	97.5	90.0 - 110	119824630
	1772947	0.358	0.161	0.200	mg/L	98.5	90.0 - 110	119824633

Analytical Set 832472 EPA 1657

Blank

Parameter	*PrepSet*	*Reading*	*MDL*	*MQL*	*Units*	*File*
Azinphos-methyl (Guthion)	832001	ND	0.0461	0.050	ug/L	119811245
Chlorpyrifos	832001	ND	0.0394	0.040	ug/L	119811245
Demeton	832001	ND	0.0377	0.050	ug/L	119811245
Diazinon	832001	ND	0.0432	0.050	ug/L	119811245
Malathion	832001	ND	0.0466	0.050	ug/L	119811245
Parathion, ethyl	832001	ND	0.0292	0.050	ug/L	119811245
Parathion, methyl	832001	ND	0.0395	0.040	ug/L	119811245

CCV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*		*File*
Azinphos-methyl (Guthion)	904	1000	ug/L	90.4	80.0 - 120		119811228
	1770	1000	ug/L	177	80.0 - 120	*	119811251
	1400	1000	ug/L	140	80.0 - 120	*	119811259
Chlorpyrifos	1030	1000	ug/L	103	80.0 - 120		119811228

Quality Control

Printed 04/16/2019

CCV

Parameter	Reading	Known	Units	Recover%	Limits%		File
Chlorpyrifos	1640	1000	ug/L	164	80.0 - 120	*	119811251
	1570	1000	ug/L	157	80.0 - 120	*	119811259
Demeton	1090	1000	ug/L	109	80.0 - 120		119811228
	1710	1000	ug/L	171	80.0 - 120	*	119811251
	1700	1000	ug/L	170	80.0 - 120	*	119811259
Diazinon	1040	1000	ug/L	104	80.0 - 120		119811228
	1850	1000	ug/L	185	80.0 - 120	*	119811251
	2020	1000	ug/L	202	80.0 - 120	*	119811259
Malathion	1030	1000	ug/L	103	80.0 - 120		119811228
	1780	1000	ug/L	178	80.0 - 120	*	119811251
	1900	1000	ug/L	190	80.0 - 120	*	119811259
Parathion, ethyl	983	1000	ug/L	98.3	80.0 - 120		119811228
	1580	1000	ug/L	158	80.0 - 120	*	119811251
	1720	1000	ug/L	172	80.0 - 120	*	119811259
Parathion, methyl	1030	1000	ug/L	103	80.0 - 120		119811228
	1590	1000	ug/L	159	80.0 - 120	*	119811251
	1570	1000	ug/L	157	80.0 - 120	*	119811259

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Azinphos-methyl (Guthion)	832001	0.423	0.702	1.00	0.100 - 166	42.3	70.2	ug/L	49.6	50.0
Chlorpyrifos	832001	0.408	0.413	1.00	0.100 - 109	40.8	41.3	ug/L	1.22	50.0
Demeton	832001	0.313	0.295	1.00	0.100 - 101	31.3	29.5	ug/L	5.92	50.0
Diazinon	832001	0.476	0.519	1.00	0.100 - 106	47.6	51.9	ug/L	8.64	50.0
Malathion	832001	0.419	0.456	1.00	0.100 - 113	41.9	45.6	ug/L	8.46	50.0
Parathion, ethyl	832001	0.428	0.544	1.00	0.100 - 111	42.8	54.4	ug/L	23.9	50.0
Parathion, methyl	832001	0.429	0.453	1.00	0.100 - 109	42.9	45.3	ug/L	5.44	50.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Tributylphosphate		CCV	742	1000	ug/L	74.2	0.100 - 118	119811228
		CCV	1640	1000	ug/L	164 *	0.100 - 118	119811251
		CCV	1710	1000	ug/L	171 *	0.100 - 118	119811259
Triphenylphosphate		CCV	988	1000	ug/L	98.8	0.100 - 147	119811228
		CCV	1490	1000	ug/L	149 *	0.100 - 147	119811251
		CCV	1540	1000	ug/L	154 *	0.100 - 147	119811259
Tributylphosphate	832001	Blank	853	1000	ug/L	85.3	0.100 - 118	119811245
	832001	LCS	412	1000	ug/L	41.2	0.100 - 118	119811246
	832001	LCS Dup	473	1000	ug/L	47.3	0.100 - 118	119811247
Triphenylphosphate	832001	Blank	723	1000	ug/L	72.3	0.100 - 147	119811245
	832001	LCS	345	1000	ug/L	34.5	0.100 - 147	119811246
	832001	LCS Dup	474	1000	ug/L	47.4	0.100 - 147	119811247
Tributylphosphate	1773049	UNKNOWN	1.02	1.03	ug/L	99.0	0.100 - 118	119811252
Triphenylphosphate	1773049	UNKNOWN	0.927	1.03	ug/L	90.0	0.100 - 147	119811252

Analytical Set 832836

EPA 617

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Kelthane (Dicofol)	831994	ND	0.0352	0.040	ug/L	119818837
Methoxychlor	831994	ND	0.00897	0.010	ug/L	119818837

Quality Control

Printed 04/16/2019

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Mirex	831994	ND	0.00905	0.010	ug/L	119818837

CCV

Parameter	Reading	Known	Units	Recover%	Limits%		File
Kelthane (Dicofol)	191	200	ug/L	95.3	70.0 - 130		119818835
	280	200	ug/L	140	70.0 - 130	*	119818844
	343	200	ug/L	172	70.0 - 130	*	119818850
Methoxychlor	101	100	ug/L	101	70.0 - 130		119818835
	127	100	ug/L	127	70.0 - 130		119818844
	142	100	ug/L	142	70.0 - 130	*	119818850
Mirex	100	100	ug/L	100	70.0 - 130		119818835
	103	100	ug/L	103	70.0 - 130		119818844
	107	100	ug/L	107	70.0 - 130		119818850

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Kelthane (Dicofol)	831994	1.40	1.45	2.00	0.100 - 130	70.0	72.5	ug/L	3.51	30.0
Methoxychlor	831994	0.983	0.965	1.00	33.6 - 137	98.3	96.5	ug/L	1.85	30.0
Mirex	831994	0.798	0.702	1.00	37.6 - 119	79.8	70.2	ug/L	12.8	30.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Decachlorobiphenyl		CCV	94.4	100	ug/L	94.4	10.0 - 150	119818835
		CCV	90.8	100	ug/L	90.8	10.0 - 150	119818844
		CCV	105	100	ug/L	105	10.0 - 150	119818850
Tetrachloro-m-Xylene (Surr)		CCV	103	100	ug/L	103	10.0 - 150	119818835
		CCV	102	100	ug/L	102	10.0 - 150	119818844
		CCV	94.1	100	ug/L	94.1	10.0 - 150	119818850
Decachlorobiphenyl	831994	Blank	67.5	100	ug/L	67.5	10.0 - 150	119818837
	831994	LCS	85.2	100	ug/L	85.2	10.0 - 150	119818838
	831994	LCS Dup	77.3	100	ug/L	77.3	10.0 - 150	119818839
Tetrachloro-m-Xylene (Surr)	831994	Blank	43.4	100	ug/L	43.4	10.0 - 150	119818837
	831994	LCS	61.3	100	ug/L	61.3	10.0 - 150	119818838
	831994	LCS Dup	57.5	100	ug/L	57.5	10.0 - 150	119818839
Decachlorobiphenyl	1773049	UNKNOWN	0.0448	0.103	ug/L	43.5	10.0 - 150	119818841
Tetrachloro-m-Xylene (Surr)	1773049	UNKNOWN	0.0578	0.103	ug/L	56.1	10.0 - 150	119818841

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100%

Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification; ICV - Initial Calibration Verification

1 of 5

869294 CoC Print Group 001 of 001

Chain of Custody

Pace Analytical®
www.pacelabs.com

Workorder: 75105824 **Workorder Name:** 548260 **Results Requested By:** 4/17/2019

Report / Invoice To
Melissa McCullough
Pace Analytical Dallas
400 West Bethany Drive
Suite 190
Allen, TX 75013
Phone (972)727-1123
Email: melissa.mccullough@pacelabs.com

Subcontract To
AnaLab

P.O. DASUB2007

State of Sample Origin: TX TPDES

					Preserved Containers		Requested Analysis		
Item	Sample ID	Collect Date/Time	Lab ID	Matrix	H2SO4	Unpreserved	617/1657	420.1 Phenol	LAB USE ONLY
1	548261	4/1/2019 10:15	75105824002	Water				X	1773045
2	548263	4/1/2019 15:51	75105824004	Water				X	046
3	548265	4/1/2019 21:57	75105824006	Water				X	047
4	548267	4/2/2019 05:35	75105824008	Water				X	048
5	548270	4/2/2019 08:00	75105824010	Water			X		049

Transfers	Released By	Date/Time	Received By	Date/Time
1		4.4.19 1700	FedEx	4.4.19 1700
2	FedEx	4/5/19 105		4/5/19 1015
3			Kelly Overman Ana-Lab Corp	

Comments
TPDES Limits See attached list
Phenol RL 10 ug/L

Cooler Temperature on Receipt ____ °C **Custody Seal** [✓ Y] or N **Received on Ice** [✓ Y] or N **Samples Intact** [✓ Y] or N

See Attached for
Tracking # and Temp

75105824

Profile List

PASI Dallas Laboratory

Client PCS **Profile N** 6252 **Line** I 2

Line Item	Acode	Cmp List	Cmp	Analyte	CAS No.	PQL	MDL	Units	Sig Figs
2	1657 W	1657 W	azin	Azinphos, methyl (Guthion)	86-50-0	0.1	0.01	ug/L	E
			chly	Chlorpyrifos	2921-88-2	0.05	0.02	ug/L	E
			diaz	Diazinon	333-41-5	0.5	0.01	ug/L	E
			prth	Parathion (Ethyl parathion)	56-38-2	0.1	0.02	ug/L	E
			mala	Malathion	121-75-5	0.1	0.01	ug/L	E
			demt	Total Demeton	8065-48-3	0.2	0.01	ug/L	E
	617 W	617 W	meox	Methoxychlor	72-43-5	2	0.02	ug/L	E
			mirx	Mirex	2385-85-5	0.02	0.02	ug/L	E
			dico	Dicofol	115-32-2	1	0.5	ug/L	E

*The MDLs listed are not instrument specific.

*Significant Figures:

Numeric Value - The actual number of significant figures
E (EPA) - Numbers less than 10 have 2 significant figures and numbers greater than or equal to 10 have 3
M (Metals) - Numbers less than 100 have 2 significant figures and numbers greater than or equal to 100 have 3
O (Organics) - Numbers less than 1 have 1 significant figure, numbers less than 100 but not less than 1 have 2 significant figures, and numbers greater than or equal to 100 have 3 significant

3 of 5

869294 CoC Print Group 001 of 001

ORIGIN ID:DNEA (972) 727-1123
SAMPLE RECIEVING
PACE ANALYTICAL
400 BETHANY STE 190

ALLEN, TX 75013
UNITED STATES US

SHIP DATE: 04APR19
ACTWGT: 51.90 LB
CAD: 0508784/CAFE3211

BILL SENDER

TO SAMPLE RECEIVING
ANA LAB
2600 DUDLEY RD

KILGORE TX 75662
(903) 984-0551 REF:
INV:
PO: DEPT:

CP

FedEx
Express

E

FRI – 05 APR 10:30A
PRIORITY OVERNIGHT

TRK# 0201 4901 3087 3322

46 GGGA

75662
TX-US SHV

Therm#: 6444 Corr Fact: 0.0
Temp: 1.2|1.2 °C
Date: 4/5 Time: 1020 Tech: CP

Chain of Custody

Pace Analytical®
www.pacelabs.com

Workorder: 75105824 **Workorder Name:** 548260 **Results Requested By:** ~~4/17/2019~~ Normal TAT

Report / Invoice To
Melissa McCullough
Pace Analytical Dallas
400 West Bethany Drive
Suite 190
Allen, TX 75013
Phone (972)727-1123
Email: melissa.mccullough@pacelabs.com

Subcontract To
AnaLab
P.O. DASUB2007

State of Sample Origin: TX TPDES

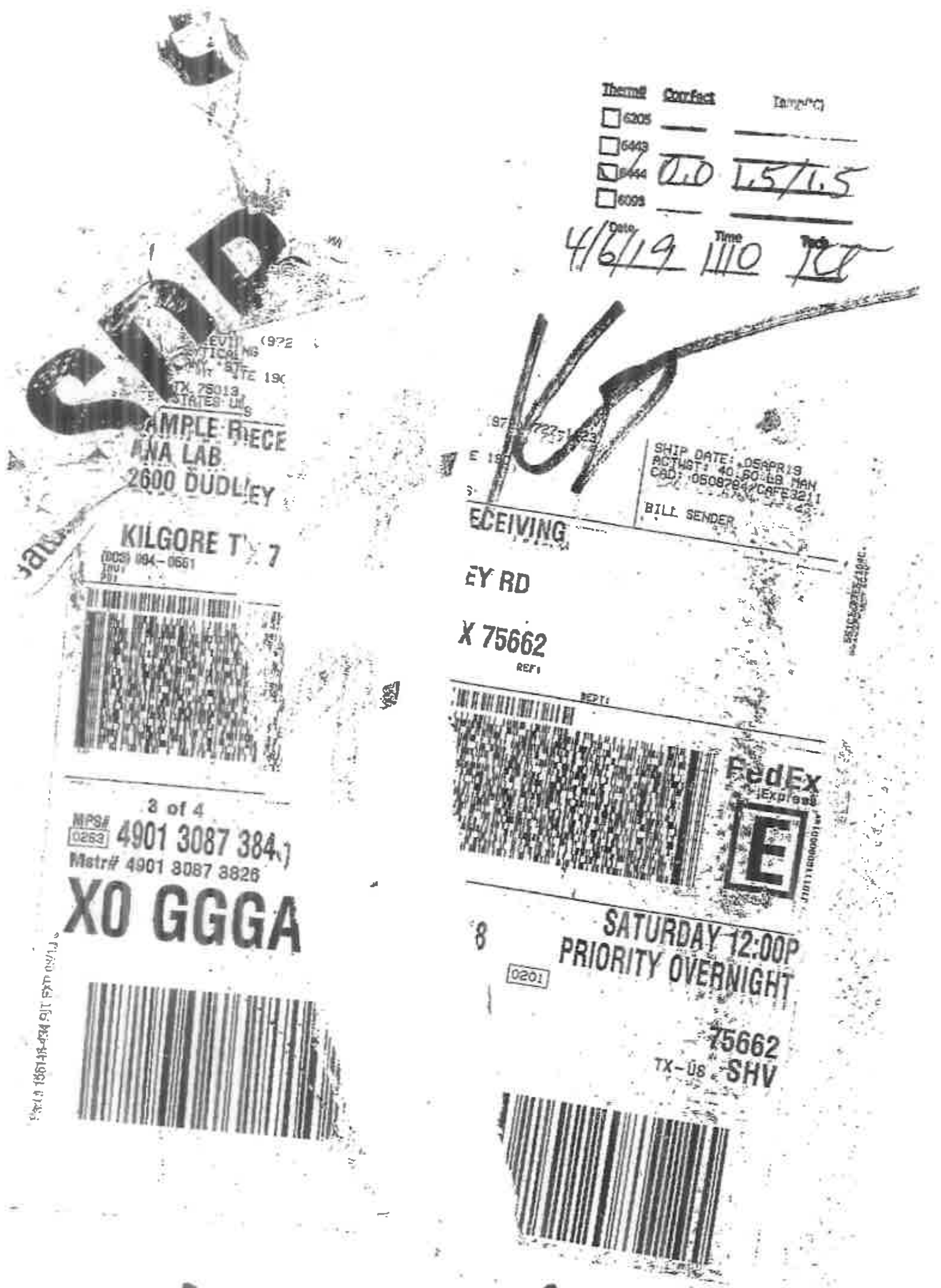
					Preserved Containers		Requested Analysis	
Item	**Sample ID**	**Collect Date/Time**	**Lab ID**	**Matrix**	H2SO4	Unpreserved	420.1 Phenol	**LAB USE ONLY**
1	548261	4/1/2019 10:15	75105824002	Water			X	1773045
2	548263	4/1/2019 15:51	75105824004	Water			X	046
3	548265	4/1/2019 21:57	75105824006	Water			X	047
4	548267	4/2/2019 05:35	75105824008	Water			X	048
5			;					

Transfers	**Released By**	**Date/Time**	**Received By**	**Date/Time**
1		4.5.19 1700		4.5.19 1700
2		4/6/19 1045		4/6/19 1045
3			Kathy Tarver Ana-Lab	

Comments
Phenol RL 10 ug/L.

Cooler Temperature on Receipt °C **Custody Seal** [✓ Y] or N **Received on Ice** [✓ Y] or N **Samples Intact** [✓ Y] or N

See Attached for
Tracking # and Temp



Therm#	CorrFact	Temp(°C)
☐ 6205	—	—
☐ 6443		
☒ 6444	0.0	1.5/1.5
☐ 6093	—	—

Date 4/6/19 Time 1110 Tech ICI

(972
EVIT
TICAL NG
SITE 190
TX 75013
STATES US
AMPLE RECE
NA LAB
2600 DUDLEY
KILGORE TX 7
(903) 984-0561
INV:
PO:

3 of 4
MPS# 4901 3087 3841
0263
Mstr# 4901 3087 3826
XO GGGA

(972) 727-1123
E 190
S
ECEIVING
EY RD
X 75662
REF:

SHIP DATE: 05APR19
ACTWGT: 40.60 LB MAN
CAD: 0509784/CAFE3211

BILL SENDER

DEPT:

FedEx
Express
E

8
SATURDAY 12:00P
PRIORITY OVERNIGHT
0201
75662
TX-US SHV

N010C

Pollution Control Services

Sample Log-In Checklist

5 4 8 2 6 0

PCS Sample No(s) 5 4 8 2 6 0 – 5 4 8 2 7 1 **COC No.** ______

Client/Company Name: NBU **Checklist Completed by:** GWF

Sample Delivery to Lab Via:

Client Drop Off ✓ Commercial Carrier: Bus ___ UPS ___ Lone Star ___ FedEx ___ USPS ___

PCS Field Services: Collection/Pick Up ___ Other: ______

Sample Kit/Coolers

Sample Kit/Cooler? Yes ✓ No ___ Sample Kit/Cooler: Intact? Yes ✓ No ___

Custody Seals on Sample Kit/Cooler: Not Present ✓ If Present, Intact ___ Broken ___

Sample Containers Intact: Unbroken and Not Leaking? Yes ✓ No ___

Custody Seals on Sample Bottles: Not Present ✓ If Present, Intact ___ Broken ___

COC Present with Shipment or Delivery or Completed at Drop Off? Yes ✓ No ___

Has COC sample date/time and other pertinent information been provided by client/sampler? Yes: ✓ No: ___

Has COC been properly Signed when Received/Relinquished? Yes ✓ No ___

Does COC agree with Sample Bottle Information, Bottle Types, Preservation, etc.? Yes ✓ No ___

All Samples Received before Hold Time Expiration? Yes ✓ No ___

Sufficient Sample Volumes for Analysis Requested? Yes ✓ No ___

Zero Headspace in VOA Vial if Present? Yes ___ No ___

Sample Preservation:

* ***Cooling:* Not Required** ___ or **Required** ✓

If cooling required, record temperature of submitted samples Observed/Corrected 8 / 5 °C

Is Ice Present in Sample Kit/Cooler? ✓ Yes ___ No Samples received same day as collected? ✓ Yes ___ No

Lab Thermometer Make and Serial Number: EX Tech 10093657 Other: ______

Acid Preserved Sample - If present, is pH <2? **Yes** ✓ **No** ___ ** ✓ H_2SO_4 ✓ HNO_3 ___ H_3PO_4

Base Preserved Sample - If present, is pH >12? Yes ✓ No ___ ___ NaOH

Other Preservation: ______ If Present, Meets Requirements? Yes ___ No ___

Sample Preservations Checked by: GWF Date 4/2/19 Time 1210

pH paper used to check sample preservation (PCS log #): 19-023 (HEM pH checked at analysis).

Samples Preserved/Adjusted by Lab:	Lab #	Parameters Preserved	Preservative Used	Log #

Adjusted by Tech/Analyst: ______ Date: ______ Time: ______

Client Notification/ Documentation for "No" Responses Above/ Discrepancies/ Revision Comments

Person Notified: ______ Contacted by: ______

Notified Date: ______ Time: ______

Method of Contact: At Drop Off: ___ Phone ___ Left Voice Mail ___ E-Mail ___ Fax ___

Unable to Contact ___ Authorized Laboratory to Proceed: ______ (Lab Director)

Regarding / Comments: ______

Actions taken to correct problems/discrepancies: ______

Receiving qualifier needed (*requires client notification above*) Temp. ___ Holding Time ___ Initails: ______

Receiving qualifier entered into LIMS at login Initial/Date: ______

Revision Comments: ______

** Samples submitted for Metals Analysis (except Hex Cr) or Drinking Water for Coliform Bacteria Only are not required to be iced. Samples collected prior day to receipt at the laboratory must meet method specific thermal cooling requirements. "or will be flagged accordingly". Samples delivered the same day as collected may not meet thermal criteria, but shall be considered acceptable if evidence that the chilling process has begun, such as arrival on ice (EPA 815-F-08-006, June 2008) ** Water samples for metals analysis that are not acid preserved prior to shipment may be acceptably preserved by the laboratory on receipt – however, the sample digestion procedure must be delayed for at least 24 hours after preservation by the laboratory.*

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #1 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1015	**PCS Sample #: 548260** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren aw Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #1 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1015	**PCS Sample #: 548261** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Phenolics	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

\+ *Subcontract Work - NELAP Certified Lab*

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RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #2 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1551	**PCS Sample #: 548262** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren cw Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

\+ *Subcontract Work - NELAP Certified Lab*

These analytical results relate only to the sample tested.
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RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #2 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1551	**PCS Sample #: 548263** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren iw Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Phenolics	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

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RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #3 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 2157	**PCS Sample #: 548264** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren CW Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

These analytical results relate only to the sample tested.
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RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #3 Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 2157	**PCS Sample #: 548265** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren cw Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Phenolics	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

+ *Subcontract Work - NELAP Certified Lab*

These analytical results relate only to the sample tested.
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RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #4 Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0535	**PCS Sample #: 548266** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab #4 Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0535	**PCS Sample #: 548267** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren

W Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Phenolics	+	See Attached					Pace Analytical Services - Dallas

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

+ *Subcontract Work - NELAP Certified Lab*

These analytical results relate only to the sample tested.
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RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab Matrix: Non-Potable Water Date/Time Taken: 04/01/2019 1015	**PCS Sample #: 548268** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren W Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Volatiles 624	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

These analytical results relate only to the sample tested.
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RL = Reporting Limits

NELAP ACCREDITED TNI LABORATORY

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548269** **Page 1 of 4** Date/Time Received: 04/02/2019 11:51 Report Date: 04/19/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Chloride	172	mg/L	1	04/04/2019 14:51	EPA 300.0	PLP
Nitrate-N	28.8	mg/L	0.1	04/03/2019 04:55	EPA 300.0	PLP
Sulfate	100	mg/L	1	04/04/2019 14:51	EPA 300.0	PLP
Fluoride	0.70	mg/L	0.10	04/03/2019 04:55	EPA 300.0	PLP
Kjeldahl-N, Total	3	mg/L	1	04/18/2019 09:00	SM 4500-N B/E	CRM
Alkalinity, Total	132	mg/L	10	04/03/2019 15:00	SM 2320 B	CRM
Arsenic/ICP MS	0.0006	mg/L	0.0005	04/10/2019 11:15	EPA 200.8	DJL

	Quality Assurance Summary							
Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Chloride	<1	10	92	99	99	102	107	85 - 115
Nitrate-N	<1	20	70	99	99	130	103	85 - 115
Sulfate	2	10	93	98	96	102	108	85 - 115
Fluoride	<1	10	83	98	99	108	102	85 - 115
Kjeldahl-N, Total	<1	10	92	97	97	109	106	85 - 115
Alkalinity, Total	<1	10	95	100	100	107	102	85 - 115
Arsenic/ICP MS	2	20	70	100	99	130	97	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

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RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548269** **Page 2 of 4** Date/Time Received: 04/02/2019 11:51 Report Date: 04/19/2019

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Barium/ICP (Total)	0.018	mg/L	0.003	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Cadmium/ICP (Total)	<0.001	mg/L	0.001	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Chromium/ICP (Total)	<0.003	mg/L	0.003	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Copper/ICP (Total)	0.008	mg/L	0.002	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Lead/ICP MS	<0.0005	mg/L	0.0005	04/10/2019 11:15	EPA 200.8	DJL
Aluminum/ICP (Total)	0.130	mg/L	0.0025	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Beryllium/ICP (Total)	<0.0005	mg/L	0.0005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Barium/ICP (Total)	1	20	75	96	95	125	110	85 - 115
Cadmium/ICP (Total)	1	20	75	100	99	125	105	85 - 115
Chromium/ICP (Total)	<1	20	75	96	96	125	110	85 - 115
Copper/ICP (Total)	<1	20	75	97	97	125	105	85 - 115
Lead/ICP MS	<1	20	70	108	108	130	106	85 - 115
Aluminum/ICP (Total)	<1	20	75	101	101	125	105	85 - 115
Beryllium/ICP (Total)	<1	20	75	100	100	125	110	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

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All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548269** **Page 3 of 4** Date/Time Received: 04/02/2019 11:51 Report Date: 04/19/2019

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Molybdenum/ICP (Total)		<0.010	mg/L	0.010	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Hexavalent Chrome	R	<0.003	mg/L	0.003	04/02/2019 16:43	SM 3500-Cr D	DJL
Antimony/ICP (Total)		<0.005	mg/L	0.005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Nickel/ICP (Total)		0.002	mg/L	0.002	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Silver/ICP (Total)		<0.0005	mg/L	0.0005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Zinc/ICP (Total)		0.071	mg/L	0.005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL
Selenium/ICP (Total)		<0.005	mg/L	0.005	04/04/2019 12:44	EPA 200.7 / 6010 B	DJL

	Quality Assurance Summary							
Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Molybdenum/ICP (Total)	1	20	75	100	99	125	105	85 - 115
Hexavalent Chrome	<1	20	75	*55	*55	125	101	85 - 115
Antimony/ICP (Total)	<1	20	75	100	100	125	105	85 - 115
Nickel/ICP (Total)	<1	20	75	92	92	125	105	85 - 115
Silver/ICP (Total)	1	20	75	89	90	125	110	85 - 115
Zinc/ICP (Total)	<1	20	75	95	95	125	105	85 - 115
Selenium/ICP (Total)	<1	20	75	100	100	125	105	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

R *Spike recovery outside control limits due to matrix effect - LCS within limits*

* *Approved for release per QA Plan, Exception to Limits - QAM Section 13-4*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548269** **Page 4 of 4** Date/Time Received: 04/02/2019 11:51 Report Date: 04/19/2019

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Thallium/ICP MS	<0.0005	mg/L	0.0005	04/10/2019 11:15	EPA 200.8	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Thallium/ICP MS	<1	20	70	106	107	130	104	85 - 115

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

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RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

NELAP ACCREDITED TNI LABORATORY

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Comp Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548270** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/17/2019 Approved by: Chuck Wallgren W Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Pesticides 617	See Attached					Pace Analytical Services - Dallas
604.1 Hexachlorophene	See Attached					Pace Analytical Services - Dallas
Semi Volatiles 625	See Attached					Pace Analytical Services - Dallas
Pesticides 608	See Attached					Pace Analytical Services - Dallas
Pesticides 632	See Attached					Pace Analytical Services - Dallas
Pesticide 1657	See Attached					Pace Analytical Services - Dallas
Herbicides 615	See Attached					Pace Analytical Services - Dallas

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: SK WWTP IPP Annual Sample ID: Eff Grab Matrix: Non-Potable Water Date/Time Taken: 04/02/2019 0800	**PCS Sample #: 548271** **Page 1 of 1** Date/Time Received: 04/02/2019 11:51 Report Date: 04/12/2019 Approved by: Chuck Wallgren CW Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Mercury/CVAFS	<0.000005	mg/L	0.000005	04/05/2019 12:54	EPA 245.7	DJL

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Mercury/CVAFS	4	20	70			130		

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Chain of Custody Number
5 4 8 2 6 0

MULTIPLE SAMPLE ANALYSIS REQUEST AND CHAIN OF CUSTODY FORM

Page 1/2

Stamp 1st sample and COC as same number

CUSTOMER INFORMATION

Name: New Braunfels Utilites

REPORT INFORMATION

Attention: Trish Soechting

Phone: (830) 608-8900

Fax: (830) 626-1361

SAMPLE INFORMATION

Project Information:

IPP SK WWTP Annual

Report "Soils" ☐ As Is ☐ Dry Wt.

Collected By:

Requested Analysis

Instructions/Comments:

Client / Field Sample ID	Collected		Field Chlorine Residual mg/L	Composite or Grab	Matrix	Container			CN-A335.1	Phenols							PCS Sample Number
	Date	Time			DW-Drinking Water; NPW-Non-potable water; WW-Wastewater; LW-Liquid Waste	Type	Number	Preservative									
Eff Grab #1 04011934	Start: 4.1.19 End:	Start: 1015 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐ ______	X								5 4 8 2 6 0 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #1 04011930	Start: 4.1.19 End:	Start: 1015 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐ ______		X							5 4 8 2 6 1 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #2 04011935	Start: 4/1/19 End:	Start: 1551 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐ ______	X								5 4 8 2 6 2 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #2 04011931	Start: 4/1/19 End:	Start: 1551 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐ ______		X							5 4 8 2 6 3 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #3 04011936	Start: 4-1-19 End:	Start: 2157 End:		☐ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐ ______	X								5 4 8 2 6 4 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #3 04011932	Start: 4-1-19 End:	Start: 2157 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐ ______		X							5 4 8 2 6 5 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #4 04021937	Start: 4-2-19 End:	Start: 0535 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐ ______	X								5 4 8 2 6 6 ☐S ☐B ☐N ☐HEM Other:
Eff Grab #4 04021933	Start: 4-2-19 End:	Start: 0535 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐ ______		X							5 4 8 2 6 7 ☐S ☐B ☐N ☐HEM Other:

Required Turnaround: ☒ Routine (6-10 days) *EXPEDITE:* (See Surcharge Schedule) ☐ < 8 Hrs. ☐ < 16 Hrs. ☐ < 24 Hrs. ☐ 5 days ☐ Other: ________ ***Rush Charges Authorized by:***

Sample Archive/Disposal: ☐ Laboratory Standard ☐ Hold for client pick up

Container Type: P = Plastic, G = Glass, O = Other

Carrier ID:

Relinquished By:		Date:	4.2.19	Time:	1151	Received By:		Date:	4/2/19
Time:	151								
Relinquished By:		Date:		Time:		Received By:		Date:	
Time:									

Rev. Multiple Sample COC 20120201

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POLLUTION CONTROL SERVICES

Chain of Custody Number

MULTIPLE SAMPLE ANALYSIS REQUEST AND CHAIN OF CUSTODY FORM

Page 2/2

Stamp 1st sample and COC as same number

CUSTOMER INFORMATION

Name: New Braunfels Utilities

REPORT INFORMATION

Attention: Trish Soechting

Phone: (830) 608-8900

Fax: (830) 626-1361

SAMPLE INFORMATION

Project Information:

IPP SK WWTP Annual

Report "Soils" ☐ As Is ☐ Dry Wt.

Collected By:

Requested Analysis

Instructions/Comments:

Client / Field Sample ID	Collected Date	Collected Time	Field Chlorine Residual mg/L	Composite or Grab	Matrix (DW-Drinking Water; NPW-Non-potable water; WW-Wastewater; LW-Liquid Waste)	Container Type	Container Number	Container Preservative	VOC 624	Metals Table 3	Hex Cr, F, NO3N	Pest 608, Pest 632	SVOC 625, Herb 615	Hex 604.1, Pest 617, Pest 1657	Hg Low Level		PCS Sample Number
Eff Grab 0401938	Start: 040119 End:	Start: 1015 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐	✗								548268 ☐S ☐B ☐N ☐HEM Other:
Eff Grab 0401939	Start: [illegible] End:	Start: 1551 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐	✗								☐S ☐B ☐N ☐HEM Other:
Eff Grab 04011940	Start: 4-1-19 End:	Start: 2200 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐	✗								☐S ☐B ☐N ☐HEM Other:
Eff Grab 04021941	Start: 4-2-19 End:	Start: 0535 End:		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	1	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐	✗								☐S ☐B ☐N ☐HEM Other:
Eff Comp 04021942	Start: 4.1.19 End: 4.2.19	Start: 1000 End: 0800		☒ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒P ☐G ☐O	2	☐ H_2SO_4 ☒ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☐		✗	✗						548269 ☐S ☐B ☒N ☐HEM Other:
Eff Comp 04021943	Start: 4.1.19 End: 4.2.19	Start: 1000 End: 0800		☒ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	7	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐				✗	✗	✗			548270 ☐S ☐B ☐N ☐HEM Other:
Eff Grab 04021944	Start: 4.1.19 End: 4.2.19	Start: 1000 End: 0800		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☒G ☐O	3	☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☒ ICE ☒ HCL							✗		548271 ☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐ C ☐ G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐P ☐G ☐O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐									☐S ☐B ☐N ☐HEM Other:

Required Turnaround: ☒ Routine (6-10 days) *EXPEDITE:* (See Surcharge Schedule) ☐ < 8 Hrs. ☐ < 16 Hrs. ☐ < 24 Hrs. ☐ 5 days ☐ Other: ________ *Rush Charges Authorized by:*

Sample Archive/Disposal: ☐ Laboratory Standard ☐ Hold for client pick up **Container Type:** P = Plastic, G = Glass, O = Other Carrier ID:

Relinquished By:		Date:	4.2.19	Time:	1151	Received By:		Date:	4/2/19
Relinquished By:		Date:		Time:		Received By:		Date:	

Time: 1151

Time:

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file path: Z:\COC\N\NBU\Inf_IPP_Annual_NK_Page2_Jan28_2016.pdf

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4/2/19

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
400 West Bethany Drive - Suite 190
Allen, TX 75013
(972)727-1123

April 17, 2019

Chuck Wallgren
Pollution Control Services
1532 Universal City Blvd. #100
Universal City, TX 78148

RE: Project: 548260
Pace Project No.: 75105824

Dear Chuck Wallgren:

Enclosed are the analytical results for sample(s) received by the laboratory on April 03, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Melissa Mc Cullough

Melissa McCullough
melissa.mccullough@pacelabs.com
(972)727-1123
Project Manager

Enclosures

cc: Michael Klang

CERTIFICATIONS

Project:	548260
Pace Project No.:	75105824

Dallas Certification IDs:

400 West Bethany Dr Suite 190, Allen, TX 75013
Florida Certification #: E871118
EPA# TX00074
Texas T104704232-18-26
Texas Certification #: T104704232-18-26

Kansas Certification #: E-10388
Arkansas Certification #: 88-0647
Oklahoma Certification #: 8727
Louisiana Certification #: 30686
Iowa Certification #: 408

SAMPLE SUMMARY

Project: 548260
Pace Project No.: 75105824

Lab ID	Sample ID	Matrix	Date Collected	Date Received
75105824001	548260	Water	04/01/19 10:15	04/03/19 10:50
75105824002	548261	Water	04/01/19 10:15	04/03/19 10:50
75105824003	548262	Water	04/01/19 15:51	04/03/19 10:50
75105824004	548263	Water	04/01/19 15:51	04/03/19 10:50
75105824005	548264	Water	04/01/19 21:57	04/03/19 10:50
75105824006	548265	Water	04/01/19 21:57	04/03/19 10:50
75105824007	548266	Water	04/02/19 05:35	04/03/19 10:50
75105824008	548267	Water	04/02/19 05:35	04/03/19 10:50
75105824009	548268	Water	04/01/19 10:15	04/03/19 10:50
75105824010	548270	Water	04/02/19 08:00	04/03/19 10:50

SAMPLE ANALYTE COUNT

Project: 548260
Pace Project No.: 75105824

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
75105824001	**548260**	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D
75105824003	**548262**	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D
75105824005	**548264**	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D
75105824007	**548266**	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D
75105824009	**548268**	EPA 624 Low	NSR	37	PASI-D
75105824010	**548270**	EPA 608	JL	28	PASI-D
		EPA 615	DAT	3	PASI-D
		EPA 604.1	XLY	2	PASI-D
		EPA 632	XLY	3	PASI-D
		EPA 625	XLY	69	PASI-D

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548260 **Lab ID: 75105824001** Collected: 04/01/19 10:15 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C								
Cyanide	ND	ug/L	10.0	4.0	1	04/12/19 12:27	04/12/19 15:46	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C								
Amenable Cyanide	ND	ug/L	10.0	4.0	1	04/15/19 08:38	04/15/19 08:39	57-12-5	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548262 **Lab ID: 75105824003** Collected: 04/01/19 15:51 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C								
Cyanide	ND	ug/L	10.0	4.0	1	04/12/19 12:27	04/12/19 15:48	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C								
Amenable Cyanide	ND	ug/L	10.0	4.0	1	04/15/19 08:38	04/15/19 08:39	57-12-5	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548264 **Lab ID: 75105824005** Collected: 04/01/19 21:57 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C								
Cyanide	ND	ug/L	10.0	4.0	1	04/12/19 12:27	04/12/19 15:48	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C								
Amenable Cyanide	ND	ug/L	10.0	4.0	1	04/15/19 08:38	04/15/19 08:39	57-12-5	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548266 **Lab ID: 75105824007** Collected: 04/02/19 05:35 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C								
Cyanide	ND	ug/L	10.0	4.0	1	04/12/19 12:27	04/12/19 15:48	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C								
Amenable Cyanide	ND	ug/L	10.0	4.0	1	04/15/19 08:38	04/15/19 08:39	57-12-5	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548268 **Lab ID: 75105824009** Collected: 04/01/19 10:15 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
624 Volatile Organics	Analytical Method: EPA 624 Low								
Acrolein	ND	ug/L	50.0	7.9	1		04/03/19 23:24	107-02-8	
Acrylonitrile	ND	ug/L	50.0	6.0	1		04/03/19 23:24	107-13-1	
Benzene	ND	ug/L	10.0	0.49	1		04/03/19 23:24	71-43-2	
Bromoform	ND	ug/L	10.0	7.5	1		04/03/19 23:24	75-25-2	
Carbon tetrachloride	ND	ug/L	2.0	1.1	1		04/03/19 23:24	56-23-5	
Chlorobenzene	ND	ug/L	10.0	0.37	1		04/03/19 23:24	108-90-7	
Dibromochloromethane	ND	ug/L	10.0	0.40	1		04/03/19 23:24	124-48-1	
Chloroethane	ND	ug/L	50.0	0.95	1		04/03/19 23:24	75-00-3	
2-Chloroethylvinyl ether	ND	ug/L	10.0	3.2	1		04/03/19 23:24	110-75-8	
Chloroform	**34.2**	ug/L	10.0	1.2	1		04/03/19 23:24	67-66-3	
Bromodichloromethane	**18.5**	ug/L	10.0	0.50	1		04/03/19 23:24	75-27-4	
1,1-Dichloroethane	ND	ug/L	5.0	1.2	1		04/03/19 23:24	75-34-3	
1,4-Dichlorobenzene	ND	ug/L	10.0	0.40	1		04/03/19 23:24	106-46-7	
1,3-Dichlorobenzene	ND	ug/L	10.0	0.43	1		04/03/19 23:24	541-73-1	
1,2-Dichlorobenzene	ND	ug/L	10.0	0.37	1		04/03/19 23:24	95-50-1	
1,2-Dibromoethane (EDB)	ND	ug/L	10.0	0.45	1		04/03/19 23:24	106-93-4	
1,2-Dichloroethane	ND	ug/L	10.0	1.1	1		04/03/19 23:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	10.0	1.1	1		04/03/19 23:24	75-35-4	
1,2-Dichloropropane	ND	ug/L	10.0	0.49	1		04/03/19 23:24	78-87-5	
Total 1,3-Dichloropropene	ND	ug/L	10.0	3.7	1		04/03/19 23:24	542-75-6	N2
Ethylbenzene	ND	ug/L	10.0	0.46	1		04/03/19 23:24	100-41-4	
Bromomethane	ND	ug/L	50.0	1.2	1		04/03/19 23:24	74-83-9	
Chloromethane	ND	ug/L	50.0	1.1	1		04/03/19 23:24	74-87-3	
2-Butanone (MEK)	ND	ug/L	50.0	4.9	1		04/03/19 23:24	78-93-3	L2
Methylene Chloride	ND	ug/L	20.0	10.0	1		04/03/19 23:24	75-09-2	
1,1,2,2-Tetrachloroethane	ND	ug/L	10.0	1.5	1		04/03/19 23:24	79-34-5	
Tetrachloroethene	ND	ug/L	10.0	1.5	1		04/03/19 23:24	127-18-4	
Toluene	ND	ug/L	10.0	1.3	1		04/03/19 23:24	108-88-3	
trans-1,2-Dichloroethene	ND	ug/L	10.0	1.2	1		04/03/19 23:24	156-60-5	
1,1,1-Trichloroethane	ND	ug/L	10.0	0.69	1		04/03/19 23:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	10.0	1.3	1		04/03/19 23:24	79-00-5	
Trichloroethene	ND	ug/L	10.0	0.60	1		04/03/19 23:24	79-01-6	
Vinyl chloride	ND	ug/L	10.0	0.93	1		04/03/19 23:24	75-01-4	
Total Trihalomethanes (Calc.)	**59.9**	ug/L	10.0	3.4	1		04/03/19 23:24		
Surrogates									
4-Bromofluorobenzene (S)	101	%.	70-130		1		04/03/19 23:24	460-00-4	
Toluene-d8 (S)	99	%.	70-130		1		04/03/19 23:24	2037-26-5	
1,2-Dichloroethane-d4 (S)	108	%.	70-130		1		04/03/19 23:24	17060-07-0	

Pace Analytical Services, LLC
400 West Bethany Drive - Suite 190
Allen, TX 75013
(972)727-1123

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548270 **Lab ID: 75105824010** Collected: 04/02/19 08:00 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
608SF GCS Pesticides and PCBs	Analytical Method: EPA 608 Preparation Method: EPA 608 SF								
Aldrin	ND	ug/L	0.010	0.0071	1	04/09/19 11:15	04/10/19 12:32	309-00-2	
alpha-BHC	ND	ug/L	0.051	0.0061	1	04/09/19 11:15	04/10/19 12:32	319-84-6	
beta-BHC	ND	ug/L	0.051	0.011	1	04/09/19 11:15	04/10/19 12:32	319-85-7	
gamma-BHC (Lindane)	ND	ug/L	0.051	0.0051	1	04/09/19 11:15	04/10/19 12:32	58-89-9	
delta-BHC	ND	ug/L	0.051	0.0041	1	04/09/19 11:15	04/10/19 12:32	319-86-8	
Chlordane (Technical)	ND	ug/L	0.20	0.042	1	04/09/19 11:15	04/10/19 12:32	57-74-9	
4,4'-DDT	ND	ug/L	0.020	0.0051	1	04/09/19 11:15	04/10/19 12:32	50-29-3	
4,4'-DDE	ND	ug/L	0.10	0.0041	1	04/09/19 11:15	04/10/19 12:32	72-55-9	
4,4'-DDD	ND	ug/L	0.10	0.0061	1	04/09/19 11:15	04/10/19 12:32	72-54-8	
Dieldrin	ND	ug/L	0.020	0.0041	1	04/09/19 11:15	04/10/19 12:32	60-57-1	
Endosulfan I	ND	ug/L	0.010	0.0041	1	04/09/19 11:15	04/10/19 12:32	959-98-8	
Endosulfan II	ND	ug/L	0.020	0.0041	1	04/09/19 11:15	04/10/19 12:32	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.10	0.0041	1	04/09/19 11:15	04/10/19 12:32	1031-07-8	
Endrin	ND	ug/L	0.020	0.0041	1	04/09/19 11:15	04/10/19 12:32	72-20-8	
Endrin aldehyde	ND	ug/L	0.10	0.012	1	04/09/19 11:15	04/10/19 12:32	7421-93-4	
Heptachlor	ND	ug/L	0.010	0.0061	1	04/09/19 11:15	04/10/19 12:32	76-44-8	
Heptachlor epoxide	ND	ug/L	0.010	0.0041	1	04/09/19 11:15	04/10/19 12:32	1024-57-3	
Toxaphene	ND	ug/L	0.31	0.21	1	04/09/19 11:15	04/10/19 12:32	8001-35-2	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.20	0.11	1	04/09/19 11:15	04/10/19 12:32	53469-21-9	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.20	0.088	1	04/09/19 11:15	04/10/19 12:32	11097-69-1	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.20	0.14	1	04/09/19 11:15	04/10/19 12:32	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.20	0.18	1	04/09/19 11:15	04/10/19 12:32	11141-16-5	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.20	0.073	1	04/09/19 11:15	04/10/19 12:32	12672-29-6	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.20	0.15	1	04/09/19 11:15	04/10/19 12:32	11096-82-5	
PCB-1016 (Aroclor 1016)	ND	ug/L	0.20	0.12	1	04/09/19 11:15	04/10/19 12:32	12674-11-2	
PCB, Total	ND	ug/L	0.20	0.18	1	04/09/19 11:15	04/10/19 12:32	1336-36-3	
Surrogates									
Tetrachloro-m-xylene (S)	69	%.	47-135		1	04/09/19 11:15	04/10/19 12:32	877-09-8	
Decachlorobiphenyl (S)	87	%.	16-161		1	04/09/19 11:15	04/10/19 12:32	2051-24-3	
615 Chlorinated Herbicides	Analytical Method: EPA 615 Preparation Method: EPA 615								
2,4-D	ND	ug/L	0.70	0.18	1	04/09/19 22:30	04/15/19 15:48	94-75-7	
2,4,5-TP (Silvex)	ND	ug/L	0.30	0.16	1	04/09/19 22:30	04/15/19 15:48	93-72-1	
Surrogates									
2,4-DCAA (S)	53	%.	44-137		1	04/09/19 22:30	04/15/19 15:48	19719-28-9	
604.1 HPLC Hexachlorophene	Analytical Method: EPA 604.1 Preparation Method: EPA 604.1								
Hexachlorophene	ND	ug/L	10.0	3.2	1	04/09/19 14:05	04/11/19 06:31	70-30-4	N3
Surrogates									
Nitrobenzene (S)	48	%.	25-108		1	04/09/19 14:05	04/11/19 06:31		
632 HPLC Carbamates	Analytical Method: EPA 632 Preparation Method: EPA 632								
Carbaryl	ND	ug/L	4.0	0.61	1	04/09/19 14:05	04/11/19 06:31	63-25-2	
Diuron	ND	ug/L	0.080	0.020	1	04/09/19 14:05	04/11/19 06:31	330-54-1	N2
Surrogates									
Nitrobenzene (S)	48	%.	18-113		1	04/09/19 14:05	04/11/19 06:31		

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548270 **Lab ID: 75105824010** Collected: 04/02/19 08:00 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
625 MSSV	Analytical Method: EPA 625 Preparation Method: EPA 625								
Nonylphenol	ND	ug/L	333	2.9	1	04/05/19 09:10	04/06/19 21:49	25154-52-3	N2
2-Chlorophenol	ND	ug/L	10.0	0.82	1	04/05/19 09:10	04/06/19 21:49	95-57-8	
2,4-Dichlorophenol	ND	ug/L	10.0	0.82	1	04/05/19 09:10	04/06/19 21:49	120-83-2	
Cresols (Total)	ND	ug/L	10.0	1.5	1	04/05/19 09:10	04/06/19 21:49	1319-77-3	N2
2,4-Dimethylphenol	ND	ug/L	10.0	1.4	1	04/05/19 09:10	04/06/19 21:49	105-67-9	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.0	1.5	1	04/05/19 09:10	04/06/19 21:49	534-52-1	
2,4-Dinitrophenol	ND	ug/L	50.0	1.1	1	04/05/19 09:10	04/06/19 21:49	51-28-5	
2-Nitrophenol	ND	ug/L	20.0	1.7	1	04/05/19 09:10	04/06/19 21:49	88-75-5	
4-Nitrophenol	ND	ug/L	50.0	1.6	1	04/05/19 09:10	04/06/19 21:49	100-02-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.0	0.77	1	04/05/19 09:10	04/06/19 21:49		
4-Chloro-3-methylphenol	ND	ug/L	10.0	0.87	1	04/05/19 09:10	04/06/19 21:49	59-50-7	
Pentachlorophenol	ND	ug/L	5.0	2.1	1	04/05/19 09:10	04/06/19 21:49	87-86-5	
Phenol	ND	ug/L	10.0	0.97	1	04/05/19 09:10	04/06/19 21:49	108-95-2	
2,4,5-Trichlorophenol	ND	ug/L	50.0	1.9	1	04/05/19 09:10	04/06/19 21:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/L	10.0	1.8	1	04/05/19 09:10	04/06/19 21:49	88-06-2	
Acenaphthene	ND	ug/L	10.0	1.3	1	04/05/19 09:10	04/06/19 21:49	83-32-9	
Acenaphthylene	ND	ug/L	10.0	1.3	1	04/05/19 09:10	04/06/19 21:49	208-96-8	
Anthracene	ND	ug/L	10.0	1.1	1	04/05/19 09:10	04/06/19 21:49	120-12-7	
Benzidine	ND	ug/L	50.0	3.1	1	04/05/19 09:10	04/06/19 21:49	92-87-5	
Benzo(a)anthracene	ND	ug/L	5.0	0.93	1	04/05/19 09:10	04/06/19 21:49	56-55-3	
Benzo(a)pyrene	ND	ug/L	5.0	0.94	1	04/05/19 09:10	04/06/19 21:49	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	10.0	1.0	1	04/05/19 09:10	04/06/19 21:49	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	20.0	1.0	1	04/05/19 09:10	04/06/19 21:49	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	2.5	0.93	1	04/05/19 09:10	04/06/19 21:49	207-08-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.0	0.99	1	04/05/19 09:10	04/06/19 21:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	10.0	1.0	1	04/05/19 09:10	04/06/19 21:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/L	2.5	1.2	1	04/05/19 09:10	04/06/19 21:49	108-60-1	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.0	3.2	1	04/05/19 09:10	04/06/19 21:49	117-81-7	
4-Bromophenylphenyl ether	ND	ug/L	10.0	1.0	1	04/05/19 09:10	04/06/19 21:49	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.0	1.4	1	04/05/19 09:10	04/06/19 21:49	85-68-7	
2-Chloronaphthalene	ND	ug/L	10.0	1.4	1	04/05/19 09:10	04/06/19 21:49	91-58-7	
4-Chlorophenylphenyl ether	ND	ug/L	10.0	1.4	1	04/05/19 09:10	04/06/19 21:49	7005-72-3	
Chrysene	ND	ug/L	5.0	1.0	1	04/05/19 09:10	04/06/19 21:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	5.0	1.1	1	04/05/19 09:10	04/06/19 21:49	53-70-3	
3,3'-Dichlorobenzidine	ND	ug/L	5.0	2.7	1	04/05/19 09:10	04/06/19 21:49	91-94-1	
Diethylphthalate	ND	ug/L	10.0	0.92	1	04/05/19 09:10	04/06/19 21:49	84-66-2	
Dimethylphthalate	ND	ug/L	10.0	0.88	1	04/05/19 09:10	04/06/19 21:49	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.0	1.2	1	04/05/19 09:10	04/06/19 21:49	84-74-2	
2,4-Dinitrotoluene	ND	ug/L	10.0	2.7	1	04/05/19 09:10	04/06/19 21:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/L	10.0	1.8	1	04/05/19 09:10	04/06/19 21:49	606-20-2	
Di-n-octylphthalate	ND	ug/L	10.0	1.7	1	04/05/19 09:10	04/06/19 21:49	117-84-0	
1,2-Diphenylhydrazine	ND	ug/L	20.0	1.2	1	04/05/19 09:10	04/06/19 21:49	122-66-7	
Fluoranthene	ND	ug/L	10.0	1.1	1	04/05/19 09:10	04/06/19 21:49	206-44-0	
Fluorene	ND	ug/L	10.0	1.3	1	04/05/19 09:10	04/06/19 21:49	86-73-7	
Hexachlorobenzene	ND	ug/L	5.0	0.97	1	04/05/19 09:10	04/06/19 21:49	118-74-1	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1.8	1	04/05/19 09:10	04/06/19 21:49	87-68-3	

ANALYTICAL RESULTS

Project: 548260
Pace Project No.: 75105824

Sample: 548270 **Lab ID: 75105824010** Collected: 04/02/19 08:00 Received: 04/03/19 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
625 MSSV	Analytical Method: EPA 625 Preparation Method: EPA 625								
Hexachlorocyclopentadiene	ND	ug/L	10.0	1.2	1	04/05/19 09:10	04/06/19 21:49	77-47-4	
Hexachloroethane	ND	ug/L	20.0	1.9	1	04/05/19 09:10	04/06/19 21:49	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/L	5.0	0.98	1	04/05/19 09:10	04/06/19 21:49	193-39-5	
Isophorone	ND	ug/L	10.0	1.8	1	04/05/19 09:10	04/06/19 21:49	78-59-1	
Naphthalene	ND	ug/L	10.0	2.0	1	04/05/19 09:10	04/06/19 21:49	91-20-3	
Nitrobenzene	ND	ug/L	10.0	1.2	1	04/05/19 09:10	04/06/19 21:49	98-95-3	
N-Nitrosodiethylamine	ND	ug/L	20.0	0.93	1	04/05/19 09:10	04/06/19 21:49	55-18-5	
N-Nitrosodimethylamine	ND	ug/L	50.0	0.65	1	04/05/19 09:10	04/06/19 21:49	62-75-9	
N-Nitroso-di-n-butylamine	ND	ug/L	20.0	0.74	1	04/05/19 09:10	04/06/19 21:49	924-16-3	
N-Nitroso-di-n-propylamine	ND	ug/L	20.0	1.1	1	04/05/19 09:10	04/06/19 21:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	20.0	0.83	1	04/05/19 09:10	04/06/19 21:49	86-30-6	
Phenanthrene	ND	ug/L	10.0	1.1	1	04/05/19 09:10	04/06/19 21:49	85-01-8	
Pentachlorobenzene	ND	ug/L	20.0	1.3	1	04/05/19 09:10	04/06/19 21:49	608-93-5	
Pyrene	ND	ug/L	10.0	1.2	1	04/05/19 09:10	04/06/19 21:49	129-00-0	
Pyridine	ND	ug/L	20.0	1.2	1	04/05/19 09:10	04/06/19 21:49	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	1.6	1	04/05/19 09:10	04/06/19 21:49	120-82-1	
1,2,4,5-Tetrachlorobenzene	ND	ug/L	20.0	1.3	1	04/05/19 09:10	04/06/19 21:49	95-94-3	
Surrogates									
Nitrobenzene-d5 (S)	67	%.	15-106		1	04/05/19 09:10	04/06/19 21:49	4165-60-0	
2-Fluorobiphenyl (S)	69	%.	26-102		1	04/05/19 09:10	04/06/19 21:49	321-60-8	
p-Terphenyl-d14 (S)	92	%.	10-120		1	04/05/19 09:10	04/06/19 21:49	1718-51-0	
Phenol-d6 (S)	28	%.	10-54		1	04/05/19 09:10	04/06/19 21:49	13127-88-3	
2-Fluorophenol (S)	38	%.	10-66		1	04/05/19 09:10	04/06/19 21:49	367-12-4	
2,4,6-Tribromophenol (S)	90	%.	29-132		1	04/05/19 09:10	04/06/19 21:49	118-79-6	

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115157
QC Batch Method: EPA 624 Low
Associated Lab Samples: 75105824009
Analysis Method: EPA 624 Low
Analysis Description: 624 MSV

METHOD BLANK: 518445
Matrix: Water
Associated Lab Samples: 75105824009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/L	ND	10.0	0.69	04/03/19 11:54	
1,1,2,2-Tetrachloroethane	ug/L	ND	10.0	1.5	04/03/19 11:54	
1,1,2-Trichloroethane	ug/L	ND	10.0	1.3	04/03/19 11:54	
1,1-Dichloroethane	ug/L	ND	5.0	1.2	04/03/19 11:54	
1,1-Dichloroethene	ug/L	ND	10.0	1.1	04/03/19 11:54	
1,2-Dibromoethane (EDB)	ug/L	ND	10.0	0.45	04/03/19 11:54	
1,2-Dichlorobenzene	ug/L	ND	10.0	0.37	04/03/19 11:54	
1,2-Dichloroethane	ug/L	ND	10.0	1.1	04/03/19 11:54	
1,2-Dichloropropane	ug/L	ND	10.0	0.49	04/03/19 11:54	
1,3-Dichlorobenzene	ug/L	ND	10.0	0.43	04/03/19 11:54	
1,4-Dichlorobenzene	ug/L	ND	10.0	0.40	04/03/19 11:54	
2-Butanone (MEK)	ug/L	ND	50.0	4.9	04/03/19 11:54	
2-Chloroethylvinyl ether	ug/L	ND	10.0	3.2	04/03/19 11:54	
Acrolein	ug/L	ND	50.0	7.9	04/03/19 11:54	
Acrylonitrile	ug/L	ND	50.0	6.0	04/03/19 11:54	
Benzene	ug/L	ND	10.0	0.49	04/03/19 11:54	
Bromodichloromethane	ug/L	ND	10.0	0.50	04/03/19 11:54	
Bromoform	ug/L	ND	10.0	7.5	04/03/19 11:54	
Bromomethane	ug/L	ND	50.0	1.2	04/03/19 11:54	
Carbon tetrachloride	ug/L	ND	2.0	1.1	04/03/19 11:54	
Chlorobenzene	ug/L	ND	10.0	0.37	04/03/19 11:54	
Chloroethane	ug/L	ND	50.0	0.95	04/03/19 11:54	
Chloroform	ug/L	ND	10.0	1.2	04/03/19 11:54	
Chloromethane	ug/L	ND	50.0	1.1	04/03/19 11:54	
Dibromochloromethane	ug/L	ND	10.0	0.40	04/03/19 11:54	
Ethylbenzene	ug/L	ND	10.0	0.46	04/03/19 11:54	
Methylene Chloride	ug/L	ND	20.0	10.0	04/03/19 11:54	
Tetrachloroethene	ug/L	ND	10.0	1.5	04/03/19 11:54	
Toluene	ug/L	ND	10.0	1.3	04/03/19 11:54	
Total 1,3-Dichloropropene	ug/L	ND	10.0	3.7	04/03/19 11:54	N2
Total Trihalomethanes (Calc.)	ug/L	ND	10.0	3.4	04/03/19 11:54	
trans-1,2-Dichloroethene	ug/L	ND	10.0	1.2	04/03/19 11:54	
Trichloroethene	ug/L	ND	10.0	0.60	04/03/19 11:54	
Vinyl chloride	ug/L	ND	10.0	0.93	04/03/19 11:54	
1,2-Dichloroethane-d4 (S)	%.	103	70-130		04/03/19 11:54	
4-Bromofluorobenzene (S)	%.	103	70-130		04/03/19 11:54	
Toluene-d8 (S)	%.	99	70-130		04/03/19 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

LABORATORY CONTROL SAMPLE: 518446

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	19.9	21.5	108	52-162	
1,1,2,2-Tetrachloroethane	ug/L	20.1	17.1	85	46-157	
1,1,2-Trichloroethane	ug/L	19.9	18.5	93	52-150	
1,1-Dichloroethane	ug/L	20	20.3	101	59-155	
1,1-Dichloroethene	ug/L	19.8	22.0	111	1-234	
1,2-Dibromoethane (EDB)	ug/L	20	18.5	92	81-118	
1,2-Dichlorobenzene	ug/L	20	19.8	99	18-190	
1,2-Dichloroethane	ug/L	19.9	18.5	93	49-155	
1,2-Dichloropropane	ug/L	19.9	20.9	105	76-124	
1,3-Dichlorobenzene	ug/L	19.9	21.0	105	59-156	
1,4-Dichlorobenzene	ug/L	20	21.0	105	18-190	
2-Butanone (MEK)	ug/L	101	57.0	57	60-130	L2
2-Chloroethylvinyl ether	ug/L	20.1	15.8	78	1-305	
Acrolein	ug/L	200	120	60	49-138	
Acrylonitrile	ug/L	199	150	76	57-137	
Benzene	ug/L	20	21.7	108	37-151	
Bromodichloromethane	ug/L	19.9	19.9	100	35-155	
Bromoform	ug/L	19.8	18.2	92	45-169	
Bromomethane	ug/L	20	19.1J	95	1-242	
Carbon tetrachloride	ug/L	19.8	21.8	110	70-140	
Chlorobenzene	ug/L	19.8	20.7	104	37-160	
Chloroethane	ug/L	20.1	20.7J	103	14-230	
Chloroform	ug/L	19.8	19.6	99	51-138	
Chloromethane	ug/L	19.9	19.5J	98	1-273	
Dibromochloromethane	ug/L	19.8	18.4	93	53-149	
Ethylbenzene	ug/L	20.1	21.8	109	37-162	
Methylene Chloride	ug/L	20.4	19.8J	97	1-221	
Tetrachloroethene	ug/L	19.9	21.2	106	64-148	
Toluene	ug/L	20	21.3	106	47-150	
Total 1,3-Dichloropropene	ug/L	40.1	38.1	95	70-130	N2
Total Trihalomethanes (Calc.)	ug/L		76.1			
trans-1,2-Dichloroethene	ug/L	20	20.8	104	54-156	
Trichloroethene	ug/L	20	21.2	106	71-157	
Vinyl chloride	ug/L	20	20.5	102	1-251	
1,2-Dichloroethane-d4 (S)	%.			93	70-130	
4-Bromofluorobenzene (S)	%.			104	70-130	
Toluene-d8 (S)	%.			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 518447 518448

Parameter	Units	75105729002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	ND	1990	1990	2210	2100	111	106	52-162	5	20	
1,1,2,2-Tetrachloroethane	ug/L	ND	2010	2010	1940	1920	96	96	46-157	1	20	
1,1,2-Trichloroethane	ug/L	ND	1990	1990	2050	1990	103	100	52-150	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 518447 518448

Parameter	Units	75105729002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1-Dichloroethane	ug/L	ND	2000	2000	2080	1960	104	98	59-155	6	20	
1,1-Dichloroethene	ug/L	ND	1980	1980	2330	2170	118	110	1-234	7	20	
1,2-Dibromoethane (EDB)	ug/L	ND	2000	2000	2000	1970	100	98	77-122	2	20	
1,2-Dichlorobenzene	ug/L	ND	2000	2000	1980	1940	99	97	18-190	2	20	
1,2-Dichloroethane	ug/L	ND	1990	1990	1990	1900	100	96	49-155	4	20	
1,2-Dichloropropane	ug/L	ND	1990	1990	2130	2030	107	102	1-210	5	20	
1,3-Dichlorobenzene	ug/L	ND	1990	1990	1980	1910	99	96	59-156	4	20	
1,4-Dichlorobenzene	ug/L	ND	2000	2000	1990	1930	99	96	18-190	3	20	
2-Butanone (MEK)	ug/L	ND	10100	10100	10000	10600	100	105	62-131	5	20	
2-Chloroethylvinyl ether	ug/L	ND	2010	2010	1700	1710	84	85	40-140	1	20	
Acrolein	ug/L	ND	20000	20000	10300	9300	52	46	10-140	11	20	
Acrylonitrile	ug/L	ND	19900	19900	21400	21600	107	108	10-140	1	20	
Benzene	ug/L	ND	2000	2000	2200	2070	110	103	37-151	6	20	
Bromodichloromethane	ug/L	ND	1990	1990	1970	1890	99	95	35-155	4	20	
Bromoform	ug/L	ND	1980	1980	1890	1890	96	95	45-169	0	20	
Bromomethane	ug/L	ND	2000	2000	1460	1440	73	72	1-242	2	20	
Carbon tetrachloride	ug/L	ND	1980	1980	2210	2090	111	105	70-140	6	20	
Chlorobenzene	ug/L	ND	1980	1980	2030	1950	102	98	37-160	4	20	
Chloroethane	ug/L	ND	2010	2010	2230	2070	111	103	14-230	8	20	
Chloroform	ug/L	ND	1980	1980	2020	1920	102	97	51-138	5	20	
Chloromethane	ug/L	ND	1990	1990	2130	1970	107	99	10-273	7	20	
Dibromochloromethane	ug/L	ND	1980	1980	1860	1830	94	93	53-149	2	20	
Ethylbenzene	ug/L	ND	2010	2010	2180	2050	109	102	37-162	6	20	
Methylene Chloride	ug/L	ND	2040	2040	1980	1880	94	89	1-221		20	
Tetrachloroethene	ug/L	ND	1990	1990	2120	2030	106	102	64-148	4	20	
Toluene	ug/L	ND	2000	2000	2100	2000	105	100	47-150	5	20	
Total 1,3-Dichloropropene	ug/L	ND	4010	4010	3740	3660	93	91	70-130	2	20	N2
Total Trihalomethanes (Calc.)	ug/L	ND			7740	7540				3	20	
trans-1,2-Dichloroethene	ug/L	ND	2000	2000	2180	2030	109	102	54-156	7	20	
Trichloroethene	ug/L	ND	2000	2000	2170	2050	109	102	71-157	6	20	
Vinyl chloride	ug/L	ND	2000	2000	2260	2080	113	104	1-251	8	20	
1,2-Dichloroethane-d4 (S)	%.						103	103	70-130			
4-Bromofluorobenzene (S)	%.						100	101	70-130			
Toluene-d8 (S)	%.						100	101	70-130			

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115494
QC Batch Method: EPA 604.1
Associated Lab Samples: 75105824010

Analysis Method: EPA 604.1
Analysis Description: 604.1 HPLC Hexachlorophene

METHOD BLANK: 520111
Matrix: Water
Associated Lab Samples: 75105824010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Hexachlorophene	ug/L	ND	10.0	3.2	04/11/19 00:15	N3
Nitrobenzene (S)	%.	73	25-108		04/11/19 00:15	

LABORATORY CONTROL SAMPLE: 520112

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Hexachlorophene	ug/L	50	30.3	61	28-123	N3
Nitrobenzene (S)	%.			76	25-108	

MATRIX SPIKE SAMPLE: 520118

Parameter	Units	75105824010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Hexachlorophene	ug/L	ND	50	33.3	67	22-130	N3
Nitrobenzene (S)	%.				70	25-108	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115478
QC Batch Method: EPA 608 SF
Associated Lab Samples: 75105824010

Analysis Method: EPA 608
Analysis Description: 608 GCS Pest PCB

METHOD BLANK: 520023
Matrix: Water
Associated Lab Samples: 75105824010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	0.0060	04/10/19 11:34	
4,4'-DDE	ug/L	ND	0.10	0.0040	04/10/19 11:34	
4,4'-DDT	ug/L	ND	0.020	0.0050	04/10/19 11:34	
Aldrin	ug/L	ND	0.010	0.0070	04/10/19 11:34	
alpha-BHC	ug/L	ND	0.050	0.0060	04/10/19 11:34	
beta-BHC	ug/L	ND	0.050	0.011	04/10/19 11:34	
Chlordane (Technical)	ug/L	ND	0.20	0.041	04/10/19 11:34	
delta-BHC	ug/L	ND	0.050	0.0040	04/10/19 11:34	
Dieldrin	ug/L	ND	0.020	0.0040	04/10/19 11:34	
Endosulfan I	ug/L	ND	0.010	0.0040	04/10/19 11:34	
Endosulfan II	ug/L	ND	0.020	0.0040	04/10/19 11:34	
Endosulfan sulfate	ug/L	ND	0.10	0.0040	04/10/19 11:34	
Endrin	ug/L	ND	0.020	0.0040	04/10/19 11:34	
Endrin aldehyde	ug/L	ND	0.10	0.012	04/10/19 11:34	
gamma-BHC (Lindane)	ug/L	ND	0.050	0.0050	04/10/19 11:34	
Heptachlor	ug/L	ND	0.010	0.0060	04/10/19 11:34	
Heptachlor epoxide	ug/L	ND	0.010	0.0040	04/10/19 11:34	
PCB-1016 (Aroclor 1016)	ug/L	ND	0.20	0.12	04/10/19 11:34	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.20	0.13	04/10/19 11:34	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.20	0.18	04/10/19 11:34	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.20	0.11	04/10/19 11:34	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.20	0.072	04/10/19 11:34	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.20	0.086	04/10/19 11:34	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.20	0.14	04/10/19 11:34	
Toxaphene	ug/L	ND	0.30	0.21	04/10/19 11:34	
Decachlorobiphenyl (S)	%.	73	16-161		04/10/19 11:34	
Tetrachloro-m-xylene (S)	%.	84	47-135		04/10/19 11:34	

LABORATORY CONTROL SAMPLE: 520024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/L	0.5	0.53	106	31-141	
4,4'-DDE	ug/L	0.5	0.50	101	30-145	
4,4'-DDT	ug/L	0.5	0.51	101	10-160	
Aldrin	ug/L	0.5	0.45	89	42-142	
alpha-BHC	ug/L	0.5	0.51	101	37-134	
beta-BHC	ug/L	0.5	0.48	96	17-147	
delta-BHC	ug/L	0.5	0.40	81	19-140	
Dieldrin	ug/L	0.5	0.49	98	36-146	
Endosulfan I	ug/L	0.5	0.48	96	45-153	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

LABORATORY CONTROL SAMPLE: 520024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endosulfan II	ug/L	0.5	0.50	100	40-140	
Endosulfan sulfate	ug/L	0.5	0.48	96	26-144	
Endrin	ug/L	0.5	0.50	101	30-147	
Endrin aldehyde	ug/L	0.5	0.48	97	40-140	
gamma-BHC (Lindane)	ug/L	0.5	0.51	102	32-127	
Heptachlor	ug/L	0.5	0.45	90	34-141	
Heptachlor epoxide	ug/L	0.5	0.48	95	25-142	
Decachlorobiphenyl (S)	%.			71	16-161	
Tetrachloro-m-xylene (S)	%.			88	47-135	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 520025 520026

Parameter	Units	75106002001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
4,4'-DDD	ug/L	ND	0.5	0.5	0.56	0.54	111	109	24-177	2	40	
4,4'-DDE	ug/L	ND	0.5	0.5	0.47	0.47	95	94	22-161	1	40	
4,4'-DDT	ug/L	ND	0.5	0.5	0.53	0.53	106	105	10-180	1	40	
Aldrin	ug/L	ND	0.5	0.5	0.45	0.44	89	89	10-156	1	40	
alpha-BHC	ug/L	ND	0.5	0.5	0.50	0.51	100	102	71-143	2	40	
beta-BHC	ug/L	ND	0.5	0.5	0.50	0.47	99	95	72-149	5	40	
delta-BHC	ug/L	ND	0.5	0.5	0.42	0.41	85	83	44-151	2	40	
Dieldrin	ug/L	ND	0.5	0.5	0.55	0.54	110	108	33-166	2	40	
Endosulfan I	ug/L	ND	0.5	0.5	0.48	0.48	97	97	27-167	0	40	
Endosulfan II	ug/L	ND	0.5	0.5	0.52	0.51	104	102	37-173	2	40	
Endosulfan sulfate	ug/L	ND	0.5	0.5	0.52	0.51	104	101	33-167	3	40	
Endrin	ug/L	ND	0.5	0.5	0.53	0.52	107	105	39-173	2	40	
Endrin aldehyde	ug/L	ND	0.5	0.5	0.55	0.53	109	105	14-180	4	40	
gamma-BHC (Lindane)	ug/L	ND	0.5	0.5	0.53	0.52	107	105	69-139	2	40	
Heptachlor	ug/L	ND	0.5	0.5	0.46	0.46	93	91	48-141	2	40	
Heptachlor epoxide	ug/L	ND	0.5	0.5	0.49	0.48	98	96	28-164	2	40	
Decachlorobiphenyl (S)	%.						85	85	16-161			
Tetrachloro-m-xylene (S)	%.						84	87	47-135			

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115532
QC Batch Method: EPA 615
Associated Lab Samples: 75105824010

Analysis Method: EPA 615
Analysis Description: 615 GCS Herbicides

METHOD BLANK: 520324
Associated Lab Samples: 75105824010

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
2,4,5-TP (Silvex)	ug/L	ND	0.30	0.15	04/15/19 11:32	
2,4-D	ug/L	ND	0.70	0.17	04/15/19 11:32	
2,4-DCAA (S)	%.	45	44-137		04/15/19 11:32	

LABORATORY CONTROL SAMPLE: 520325

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-TP (Silvex)	ug/L	3	2.6	85	57-125	
2,4-D	ug/L	3	2.5	83	49-133	
2,4-DCAA (S)	%.			53	44-137	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 520326 520327

Parameter	Units	75106015001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
2,4,5-TP (Silvex)	ug/L	ND	3.1	3.1	2.8	2.7	90	89	44-134	2	40	
2,4-D	ug/L	ND	3.1	3.1	2.6	2.4	85	80	49-145	7	40	
2,4-DCAA (S)	%.						60	56	44-137			

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115297
QC Batch Method: EPA 625
Associated Lab Samples: 75105824010

Analysis Method: EPA 625
Analysis Description: 625 MSS

METHOD BLANK: 519256
Associated Lab Samples: 75105824010

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4,5-Tetrachlorobenzene	ug/L	ND	20.0	1.3	04/06/19 13:45	
1,2,4-Trichlorobenzene	ug/L	ND	10.0	1.6	04/06/19 13:45	
1,2-Diphenylhydrazine	ug/L	ND	20.0	1.2	04/06/19 13:45	
2,4,5-Trichlorophenol	ug/L	ND	50.0	1.9	04/06/19 13:45	
2,4,6-Trichlorophenol	ug/L	ND	10.0	1.8	04/06/19 13:45	
2,4-Dichlorophenol	ug/L	ND	10.0	0.82	04/06/19 13:45	
2,4-Dimethylphenol	ug/L	ND	10.0	1.4	04/06/19 13:45	
2,4-Dinitrophenol	ug/L	ND	50.0	1.1	04/06/19 13:45	
2,4-Dinitrotoluene	ug/L	ND	10.0	2.7	04/06/19 13:45	
2,6-Dinitrotoluene	ug/L	ND	10.0	1.8	04/06/19 13:45	
2-Chloronaphthalene	ug/L	ND	10.0	1.4	04/06/19 13:45	
2-Chlorophenol	ug/L	ND	10.0	0.82	04/06/19 13:45	
2-Nitrophenol	ug/L	ND	20.0	1.7	04/06/19 13:45	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	10.0	0.77	04/06/19 13:45	
3,3'-Dichlorobenzidine	ug/L	ND	5.0	2.7	04/06/19 13:45	
4,6-Dinitro-2-methylphenol	ug/L	ND	10.0	1.5	04/06/19 13:45	
4-Bromophenylphenyl ether	ug/L	ND	10.0	1.0	04/06/19 13:45	
4-Chloro-3-methylphenol	ug/L	ND	10.0	0.87	04/06/19 13:45	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	1.4	04/06/19 13:45	
4-Nitrophenol	ug/L	ND	50.0	1.6	04/06/19 13:45	
Acenaphthene	ug/L	ND	10.0	1.3	04/06/19 13:45	
Acenaphthylene	ug/L	ND	10.0	1.3	04/06/19 13:45	
Anthracene	ug/L	ND	10.0	1.1	04/06/19 13:45	
Benzidine	ug/L	ND	50.0	3.1	04/06/19 13:45	
Benzo(a)anthracene	ug/L	ND	5.0	0.93	04/06/19 13:45	
Benzo(a)pyrene	ug/L	ND	5.0	0.94	04/06/19 13:45	
Benzo(b)fluoranthene	ug/L	ND	10.0	1.0	04/06/19 13:45	
Benzo(g,h,i)perylene	ug/L	ND	20.0	1.0	04/06/19 13:45	
Benzo(k)fluoranthene	ug/L	ND	2.5	0.93	04/06/19 13:45	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	0.99	04/06/19 13:45	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	1.0	04/06/19 13:45	
bis(2-Chloroisopropyl) ether	ug/L	ND	2.5	1.2	04/06/19 13:45	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	3.2	04/06/19 13:45	
Butylbenzylphthalate	ug/L	ND	10.0	1.4	04/06/19 13:45	
Chrysene	ug/L	ND	5.0	1.0	04/06/19 13:45	
Cresols (Total)	ug/L	ND	10.0	1.5	04/06/19 13:45	N2
Di-n-butylphthalate	ug/L	ND	10.0	1.2	04/06/19 13:45	
Di-n-octylphthalate	ug/L	ND	10.0	1.7	04/06/19 13:45	
Dibenz(a,h)anthracene	ug/L	ND	5.0	1.1	04/06/19 13:45	
Diethylphthalate	ug/L	ND	10.0	0.92	04/06/19 13:45	
Dimethylphthalate	ug/L	ND	10.0	0.88	04/06/19 13:45	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

METHOD BLANK: 519256 Matrix: Water
Associated Lab Samples: 75105824010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoranthene	ug/L	ND	10.0	1.1	04/06/19 13:45	
Fluorene	ug/L	ND	10.0	1.3	04/06/19 13:45	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	1.8	04/06/19 13:45	
Hexachlorobenzene	ug/L	ND	5.0	0.97	04/06/19 13:45	
Hexachlorocyclopentadiene	ug/L	ND	10.0	1.2	04/06/19 13:45	
Hexachloroethane	ug/L	ND	20.0	1.9	04/06/19 13:45	
Indeno(1,2,3-cd)pyrene	ug/L	ND	5.0	0.98	04/06/19 13:45	
Isophorone	ug/L	ND	10.0	1.8	04/06/19 13:45	
N-Nitroso-di-n-butylamine	ug/L	ND	20.0	0.74	04/06/19 13:45	
N-Nitroso-di-n-propylamine	ug/L	ND	20.0	1.1	04/06/19 13:45	
N-Nitrosodiethylamine	ug/L	ND	20.0	0.93	04/06/19 13:45	
N-Nitrosodimethylamine	ug/L	ND	50.0	0.65	04/06/19 13:45	
N-Nitrosodiphenylamine	ug/L	ND	20.0	0.83	04/06/19 13:45	
Naphthalene	ug/L	ND	10.0	2.0	04/06/19 13:45	
Nitrobenzene	ug/L	ND	10.0	1.2	04/06/19 13:45	
Nonylphenol	ug/L	ND	333	2.9	04/06/19 13:45	N2
Pentachlorobenzene	ug/L	ND	20.0	1.3	04/06/19 13:45	
Pentachlorophenol	ug/L	ND	5.0	2.1	04/06/19 13:45	
Phenanthrene	ug/L	ND	10.0	1.1	04/06/19 13:45	
Phenol	ug/L	ND	10.0	0.97	04/06/19 13:45	
Pyrene	ug/L	ND	10.0	1.2	04/06/19 13:45	
Pyridine	ug/L	ND	20.0	1.2	04/06/19 13:45	
2,4,6-Tribromophenol (S)	%.	84	29-132		04/06/19 13:45	
2-Fluorobiphenyl (S)	%.	102	26-102		04/06/19 13:45	
2-Fluorophenol (S)	%.	53	10-66		04/06/19 13:45	
Nitrobenzene-d5 (S)	%.	97	15-106		04/06/19 13:45	
p-Terphenyl-d14 (S)	%.	122	10-120		04/06/19 13:45	S3
Phenol-d6 (S)	%.	41	10-54		04/06/19 13:45	

LABORATORY CONTROL SAMPLE: 519257

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4,5-Tetrachlorobenzene	ug/L	50	45.5	91	35-108	
1,2,4-Trichlorobenzene	ug/L	50	43.9	88	44-142	
1,2-Diphenylhydrazine	ug/L	50	47.7	95	62-114	
2,4,5-Trichlorophenol	ug/L	50	50.9	102	60-118	
2,4,6-Trichlorophenol	ug/L	50	49.7	99	37-144	
2,4-Dichlorophenol	ug/L	50	47.1	94	39-135	
2,4-Dimethylphenol	ug/L	50	34.5	69	32-119	
2,4-Dinitrophenol	ug/L	50	44.9J	90	1-191	
2,4-Dinitrotoluene	ug/L	50	52.9	106	39-139	
2,6-Dinitrotoluene	ug/L	50	52.2	104	50-158	
2-Chloronaphthalene	ug/L	50	48.5	97	60-118	
2-Chlorophenol	ug/L	50	42.9	86	23-134	

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QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

LABORATORY CONTROL SAMPLE: 519257

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Nitrophenol	ug/L	50	50.7	101	29-182	
3&4-Methylphenol(m&p Cresol)	ug/L	50	38.8	78	33-110	
3,3'-Dichlorobenzidine	ug/L	100	112	112	1-262	
4,6-Dinitro-2-methylphenol	ug/L	50	48.2	96	1-181	
4-Bromophenylphenyl ether	ug/L	50	48.2	96	53-127	
4-Chloro-3-methylphenol	ug/L	50	49.5	99	22-147	
4-Chlorophenylphenyl ether	ug/L	50	48.7	97	25-158	
4-Nitrophenol	ug/L	50	36.3J	73	1-132	
Acenaphthene	ug/L	50	46.2	92	47-145	
Acenaphthylene	ug/L	50	47.5	95	33-145	
Anthracene	ug/L	50	48.1	96	27-133	
Benzidine	ug/L	100	81.6	82	10-140	
Benzo(a)anthracene	ug/L	50	44.5	89	33-143	
Benzo(a)pyrene	ug/L	50	49.5	99	17-163	
Benzo(b)fluoranthene	ug/L	50	51.2	102	24-159	
Benzo(g,h,i)perylene	ug/L	50	52.9	106	1-219	
Benzo(k)fluoranthene	ug/L	50	48.5	97	11-162	
bis(2-Chloroethoxy)methane	ug/L	50	45.4	91	33-184	
bis(2-Chloroethyl) ether	ug/L	50	43.8	88	12-158	
bis(2-Chloroisopropyl) ether	ug/L	50	42.9	86	36-166	
bis(2-Ethylhexyl)phthalate	ug/L	50	50.6	101	8-158	
Butylbenzylphthalate	ug/L	50	48.1	96	1-152	
Chrysene	ug/L	50	47.2	94	17-168	
Cresols (Total)	ug/L	100	78.7	79	36-110	N2
Di-n-butylphthalate	ug/L	50	49.4	99	1-118	
Di-n-octylphthalate	ug/L	50	53.2	106	4-146	
Dibenz(a,h)anthracene	ug/L	50	54.0	108	1-227	
Diethylphthalate	ug/L	50	49.7	99	1-114	
Dimethylphthalate	ug/L	50	49.7	99	1-112	
Fluoranthene	ug/L	50	50.4	101	26-137	
Fluorene	ug/L	50	48.2	96	59-121	
Hexachloro-1,3-butadiene	ug/L	50	44.5	89	24-116	
Hexachlorobenzene	ug/L	50	48.4	97	1-152	
Hexachlorocyclopentadiene	ug/L	50	47.8	96	12-121	
Hexachloroethane	ug/L	50	40.1	80	40-113	
Indeno(1,2,3-cd)pyrene	ug/L	50	53.7	107	1-171	
Isophorone	ug/L	50	48.1	96	21-196	
N-Nitroso-di-n-butylamine	ug/L	50	48.4	97	49-117	
N-Nitroso-di-n-propylamine	ug/L	50	46.4	93	1-230	
N-Nitrosodiethylamine	ug/L	50	43.9	88	40-140	
N-Nitrosodimethylamine	ug/L	50	29.3J	59	26-77	
N-Nitrosodiphenylamine	ug/L	50	52.0	104	67-115	
Naphthalene	ug/L	50	44.2	88	21-133	
Nitrobenzene	ug/L	50	45.7	91	35-180	
Nonylphenol	ug/L	50	47.3J	95	57-136	N2
Pentachlorobenzene	ug/L	50	48.0	96	40-140	
Pentachlorophenol	ug/L	50	31.8	64	14-176	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

LABORATORY CONTROL SAMPLE: 519257

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phenanthrene	ug/L	50	47.5	95	54-120	
Phenol	ug/L	50	20.4	41	5-112	
Pyrene	ug/L	50	50.5	101	52-115	
Pyridine	ug/L	50	23.9	48	12-110	
2,4,6-Tribromophenol (S)	%.			105	29-132	
2-Fluorobiphenyl (S)	%.			97	26-102	
2-Fluorophenol (S)	%.			57	10-66	
Nitrobenzene-d5 (S)	%.			93	15-106	
p-Terphenyl-d14 (S)	%.			100	10-120	
Phenol-d6 (S)	%.			44	10-54	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 519258 519259

Parameter	Units	75105745001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4,5-Tetrachlorobenzene	ug/L	ND	49.5	50	40.1	37.5	81	75	37-105	6	40	
1,2,4-Trichlorobenzene	ug/L	ND	49.5	50	38.8	35.8	78	72	44-142	8	40	
1,2-Diphenylhydrazine	ug/L	ND	49.5	50	45.0	43.9	91	88	43-124	2	40	
2,4,5-Trichlorophenol	ug/L	ND	49.5	50	48.1J	46.3J	97	93	50-121	4	40	
2,4,6-Trichlorophenol	ug/L	ND	49.5	50	47.4	45.0	96	90	37-144	5	40	
2,4-Dichlorophenol	ug/L	ND	49.5	50	45.1	41.7	91	83	39-135	8	40	
2,4-Dimethylphenol	ug/L	ND	49.5	50	42.4	39.4	86	79	32-119	7	40	
2,4-Dinitrophenol	ug/L	ND	49.5	50	48.5J	44.9J	98	90	1-191	8	40	
2,4-Dinitrotoluene	ug/L	ND	49.5	50	51.4	50.5	104	101	39-139	2	40	
2,6-Dinitrotoluene	ug/L	ND	49.5	50	49.7	48.0	100	96	50-158	4	40	
2-Chloronaphthalene	ug/L	ND	49.5	50	43.8	38.0	88	76	60-118	14	40	
2-Chlorophenol	ug/L	ND	49.5	50	39.8	36.9	80	74	23-134	7	40	
2-Nitrophenol	ug/L	ND	49.5	50	48.0	44.8	97	90	29-182	7	40	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	49.5	50	37.7	34.3	76	69	10-105	9	40	
3,3'-Dichlorobenzidine	ug/L	ND	99	100	40.3	36.4	41	36	1-262	10	40	
4,6-Dinitro-2-methylphenol	ug/L	ND	49.5	50	49.1	48.3	99	97	1-181	2	40	
4-Bromophenylphenyl ether	ug/L	ND	49.5	50	44.9	43.5	91	87	53-127	3	40	
4-Chloro-3-methylphenol	ug/L	ND	49.5	50	49.3	47.2	100	94	22-147	4	40	
4-Chlorophenylphenyl ether	ug/L	ND	49.5	50	45.8	44.0	92	88	25-158	4	40	
4-Nitrophenol	ug/L	ND	49.5	50	37.4J	35.1J	76	70	1-132	6	40	
Acenaphthene	ug/L	ND	49.5	50	42.7	40.8	86	82	47-145	4	40	
Acenaphthylene	ug/L	ND	49.5	50	43.3	40.9	87	82	33-145	6	40	
Anthracene	ug/L	ND	49.5	50	44.6	44.0	90	88	27-133	1	40	
Benzidine	ug/L	ND	99	100	3.9J	3.4J	4	3	10-74		40	M1
Benzo(a)anthracene	ug/L	ND	49.5	50	42.1	40.9	85	82	33-143	3	40	
Benzo(a)pyrene	ug/L	ND	49.5	50	44.5	43.8	90	88	17-163	2	40	
Benzo(b)fluoranthene	ug/L	ND	49.5	50	46.1	45.1	93	90	24-159	2	40	
Benzo(g,h,i)perylene	ug/L	ND	49.5	50	52.4	52.4	106	105	1-219	0	40	
Benzo(k)fluoranthene	ug/L	ND	49.5	50	43.7	43.5	88	87	11-162	0	40	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 519258 519259

Parameter	Units	75105745001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
bis(2-Chloroethoxy)methane	ug/L	ND	49.5	50	42.4	39.4	86	79	33-184	7	40	
bis(2-Chloroethyl) ether	ug/L	ND	49.5	50	42.0	39.2	85	78	12-158	7	40	
bis(2-Chloroisopropyl) ether	ug/L	ND	49.5	50	40.2	37.3	81	75	36-166	7	40	
bis(2-Ethylhexyl)phthalate	ug/L	ND	49.5	50	48.8	48.1	99	96	8-158	2	40	
Butylbenzylphthalate	ug/L	ND	49.5	50	46.5	45.9	94	92	1-152	1	40	
Chrysene	ug/L	ND	49.5	50	44.3	43.6	89	87	17-168	2	40	
Cresols (Total)	ug/L	ND	99	100	77.0	70.1	78	70	10-118	9	40	N2
Di-n-butylphthalate	ug/L	ND	49.5	50	48.5	47.0	98	94	1-118	3	40	
Di-n-octylphthalate	ug/L	ND	49.5	50	51.3	51.0	104	102	4-146	0	40	
Dibenz(a,h)anthracene	ug/L	ND	49.5	50	52.7	52.7	107	105	1-227	0	40	
Diethylphthalate	ug/L	ND	49.5	50	48.8	47.5	99	95	1-114	3	40	
Dimethylphthalate	ug/L	ND	49.5	50	47.6	45.3	96	91	1-112	5	40	
Fluoranthene	ug/L	ND	49.5	50	47.5	46.5	96	93	26-137	2	40	
Fluorene	ug/L	ND	49.5	50	45.2	43.6	91	87	59-121	4	40	
Hexachloro-1,3-butadiene	ug/L	ND	49.5	50	39.0	35.9	79	72	24-116	8	40	
Hexachlorobenzene	ug/L	ND	49.5	50	45.3	43.5	92	87	1-152	4	40	
Hexachlorocyclopentadiene	ug/L	ND	49.5	50	37.0	32.1	75	64	10-123	14	40	
Hexachloroethane	ug/L	ND	49.5	50	35.1	33.1	71	66	40-113	6	40	
Indeno(1,2,3-cd)pyrene	ug/L	ND	49.5	50	52.8	52.5	107	105	1-171	0	40	
Isophorone	ug/L	ND	49.5	50	45.8	42.5	93	85	21-196	8	40	
N-Nitroso-di-n-butylamine	ug/L	ND	49.5	50	47.0	43.8	95	88	41-119	7	40	
N-Nitroso-di-n-propylamine	ug/L	ND	49.5	50	44.2	40.7	89	81	1-230	8	40	
N-Nitrosodiethylamine	ug/L	ND	49.5	50	42.7	39.5	86	79	25-126	8	40	
N-Nitrosodimethylamine	ug/L	ND	49.5	50	28.1J	25.2J	57	50	14-77	11	40	
N-Nitrosodiphenylamine	ug/L	ND	49.5	50	49.6	49.0	100	98	35-131	1	40	
Naphthalene	ug/L	ND	49.5	50	43.6	41.3	88	83	21-133	5	40	
Nitrobenzene	ug/L	ND	49.5	50	50.9	49.4	103	99	35-180	3	40	
Nonylphenol	ug/L	ND	49.5	50	46.7J	45.2J	94	90	37-142	3	40	N2
Pentachlorobenzene	ug/L	ND	49.5	50	44.5	42.2	90	84	48-111	5	40	
Pentachlorophenol	ug/L	ND	49.5	50	42.0	41.2	85	82	14-176	2	40	
Phenanthrene	ug/L	ND	49.5	50	44.0	43.2	89	86	54-120	2	40	
Phenol	ug/L	ND	49.5	50	20.4	18.1	41	36	5-112	12	40	
Pyrene	ug/L	ND	49.5	50	46.7	45.6	94	91	52-115	2	40	
Pyridine	ug/L	ND	49.5	50	20.7	19.2J	42	38	10-69	8	40	
2,4,6-Tribromophenol (S)	%.						103	102	29-132			
2-Fluorobiphenyl (S)	%.						83	79	26-102			
2-Fluorophenol (S)	%.						51	47	10-66			
Nitrobenzene-d5 (S)	%.						82	78	15-106			
p-Terphenyl-d14 (S)	%.						93	94	10-120			
Phenol-d6 (S)	%.						40	37	10-54			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115496
QC Batch Method: EPA 632
Associated Lab Samples: 75105824010

Analysis Method: EPA 632
Analysis Description: 632 HPLC Carbamates

METHOD BLANK: 520122
Matrix: Water
Associated Lab Samples: 75105824010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Carbaryl	ug/L	ND	4.0	0.61	04/11/19 00:15	
Diuron	ug/L	ND	0.080	0.020	04/11/19 00:15	N2
Nitrobenzene (S)	%.	73	18-113		04/11/19 00:15	

LABORATORY CONTROL SAMPLE: 520123

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbaryl	ug/L	10	10	100	59-119	
Diuron	ug/L	5	4.5	90	61-114	N2
Nitrobenzene (S)	%.			76	18-113	

MATRIX SPIKE SAMPLE: 520124

Parameter	Units	75105824010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Carbaryl	ug/L	ND	10	9.1	91	45-139	
Diuron	ug/L	ND	5	4.6	92	54-127	N2
Nitrobenzene (S)	%.				70	18-113	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115682
QC Batch Method: SM 4500-CN-C
Analysis Method: SM 4500-CN-E
Analysis Description: 4500CNE Cyanide, Total
Associated Lab Samples: 75105824001, 75105824003, 75105824005, 75105824007

METHOD BLANK: 521009
Matrix: Water
Associated Lab Samples: 75105824001, 75105824003, 75105824005, 75105824007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	4.0	04/12/19 15:43	

LABORATORY CONTROL SAMPLE: 521010

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	100	104	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 521011 521012

Parameter	Units	75105934001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	100	100	ND	ND	0	0	85-115		20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 521013 521014

Parameter	Units	75105824007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	100	100	88.3	103	88	103	85-115	15	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 548260
Pace Project No.: 75105824

QC Batch: 115814
Analysis Method: SM 4500-CN-G
QC Batch Method: SM 4500-CN-C
Analysis Description: 4500CNG Cyanide, Amenable
Associated Lab Samples: 75105824001, 75105824003, 75105824005, 75105824007

METHOD BLANK: 521767
Matrix: Water
Associated Lab Samples: 75105824001, 75105824003, 75105824005, 75105824007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Amenable Cyanide	ug/L	ND	10.0	4.0	04/15/19 08:39	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALIFIERS

Project: 548260
Pace Project No.: 75105824

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The Nelac Institute

LABORATORIES

PASI-D	Pace Analytical Services - Dallas

ANALYTE QUALIFIERS

L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
S3	Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated sample.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 548260
Pace Project No.: 75105824

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
75105824010	548270	EPA 608 SF	115478	EPA 608	115547
75105824010	548270	EPA 615	115532	EPA 615	115834
75105824010	548270	EPA 604.1	115494	EPA 604.1	115692
75105824010	548270	EPA 632	115496	EPA 632	115560
75105824010	548270	EPA 625	115297	EPA 625	115354
75105824009	548268	EPA 624 Low	115157		
75105824001	548260	SM 4500-CN-C	115682	SM 4500-CN-E	115778
75105824003	548262	SM 4500-CN-C	115682	SM 4500-CN-E	115778
75105824005	548264	SM 4500-CN-C	115682	SM 4500-CN-E	115778
75105824007	548266	SM 4500-CN-C	115682	SM 4500-CN-E	115778
75105824001	548260	SM 4500-CN-C	115814	SM 4500-CN-G	115815
75105824003	548262	SM 4500-CN-C	115814	SM 4500-CN-G	115815
75105824005	548264	SM 4500-CN-C	115814	SM 4500-CN-G	115815
75105824007	548266	SM 4500-CN-C	115814	SM 4500-CN-G	115815

Pace Analytical®	Document Name: Sample Condition Upon Receipt	Document Revised: 03-14-19 Page 1 of 1
	Document No.: F-DAL-C-001-rev.9	Issuing Authority: Pace Dallas Quality Office

Sample Condition Upon Receipt

☑ Dallas ☐ Ft Worth

WO# : 75105824
75105824

Client Name: DCS Project Work order:

Courier: FedEX ☐ UPS ☐ USPS ☐ Client ☐ LSO ☑ PACE ☐ Other:

Tracking #: ZY00NAVJ

Custody Seal on Cooler/Box: Yes ☐ No ☑ **Packing Material:** Bubble Wrap/Bags ☑ Foam ☐ None ☐ Other ☐

Received on ice: Yes ☑ No ☐ **Type of Ice:** Wet ☑ Blue ☐

Thermometer Used: IR-11 **Cooler Temp °C:** 1.4 (Recorded) 0 (Correction Factor) 1.4 (Actual)

Temperature should be above freezing to 6°C

Chain of Custody relinquished	Yes ☑ No ☐
Sampler name & signature on COC	Yes ☐ No ☑
Short HT analyses (<72 hrs)	Yes ☑ No ☐
Sufficient Volume received	Yes ☑ No ☐
Correct Container used	Yes ☑ No ☐
Container Intact	Yes ☑ No ☐
Sample pH Acceptable pH Strips: 141031 Residual Chlorine Present Cl Strips: ~~[illegible]~~ MG 4.3.19 141364 Sulfide Present Lead Acetate Strips: 141365	Yes ☑ No ☐ NA ☐ Yes ☑ No ☐ NA ☐ Yes ☑ No ☐ NA ☐
Are soil samples (volatiles, TPH) received in 5035A Kits	Yes ☐ No ☐ NA ☑
Unpreserved 5035A soil frozen within 48 hrs	Yes ☐ No ☐ NA ☑
Headspace in VOA (>6mm)	Yes ☐ No ☑ NA ☐
Project sampled in USDA Regulated Area: State Sampled: TX	Yes ☑ No ☐
Non-Conformance(s):	Yes ☐ No ☑

POLLUTION CONTROL SERVICES
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318
Facsimilie 210.658.7903
210.340.0343

CHAIN OF CUSTODY & SUBCONTRACT TRACKING SHEET

TO: Pace Analytical Services, Inc.
400 W Bethany Rd, Ste 190
Allen, TX 75013

Relinquished by: Greg Felux
Date/Time: 4/2/2019 @ 1700
Received by: /Pace
Date/Time: 4/3/19 1050 3.3 IR-11

PCS#	Date	Time	Analysis Requested	Pres	T. A. T.
548260	04/01/2019	1015	Cyanide, Amenable	NAOH	Std
548261	04/01/2019	1015	Phenolics	H2SO4	Std
548262	04/01/2019	1551	Cyanide, Amenable	NAOH	Std
548263	04/01/2019	1551	Phenolics	H2SO4	Std
548264	04/01/2019	2157	Cyanide, Amenable	NAOH	Std
548265	04/01/2019	2157	Phenolics	H2SO4	Std
548266	04/02/2019	0535	Cyanide, Amenable	NAOH	Std
548267	04/02/2019	0535	Phenolics	H2SO4	Std
548268	04/01/2019	1015	Volatiles 624	ICE	Std
548270	04/02/2019	0800	604.1 Hexachlorophene	ICE	STD

Comments/Special Instructions:

Unless otherwise requested, send results and invoice to:

Chuck Wallgren
Pollution Control Services
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318

WO#: 75105824
PM: MLM Due Date: 04/17/19
CLIENT: PCS

Authorized by: Date: 4/2/19

over

POLLUTION CONTROL SERVICES
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318
Facsimilie 210.658.7903
210.340.0343

CHAIN OF CUSTODY & SUBCONTRACT TRACKING SHEET

TO: Pace Analytical Services, Inc.
400 W Bethany Rd, Ste 190
Allen, TX 75013

Relinquished by: Greg Felux
Date/Time: 4/2/2019 @ 1700
Received by:
Date/Time:

PCS#	Date	Time	Analysis Requested	Pres	T. A. T.
548270	----------	----	Semi Volatiles 625	ICE	----
548270	----------	----	Herbicides 615		----
548270	----------	----	Pesticide 1657		----
548270	----------	----	Pesticides 608		----
548270	----------	----	Pesticides 617		----
548270	----------	----	Pesticides 632	ICE	---

Comments/Special Instructions:

Unless otherwise requested, send results and invoice to:

Chuck Wallgren
Pollution Control Services
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318

WO#: 75105824
PM: MLM Due Date: 04/17/19
CLIENT: PCS

Authorized by: Date: 4/2/19

Ana-Lab Corp. P.O. Box 9000 Kilgore, TX 75663
Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com
Employee Owned Integrity Caring Continual Improvement

Results

Page 1 of 4

Printed: 04/16/2019 14:43

75105824

Account	*Project*
PAMM-N	869294

Report To

Pace Analytical - Dallas
Melissa McCullough
400 West Bethany Drive
Suite 190
Allen, TX 75013

Results

1773045 **75105824002** *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007

Taken: 04/01/2019 10:15:00

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 833090 04/12/2019 11:20:00 MLC

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	**Phenolics, Total Recoverable**	<0.005	mg/L	0.005			02

1773046 **75105824004** *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007

Taken: 04/01/2019 15:51:00

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 833090 04/12/2019 11:22:00 MLC

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	**Phenolics, Total Recoverable**	<0.005	mg/L	0.005			02

1773047 **75105824006** *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007

Taken: 04/01/2019 21:57:00

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 833090 04/12/2019 11:25:00 MLC

	Parameter	*Results*	*Units*	*RL*	*Flag*	*CAS*	*Bottle*
N	**Phenolics, Total Recoverable**	<0.005	mg/L	0.005			02

1773048 **75105824008** *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007

Taken: 04/02/2019 05:35:00

Results

Printed: 04/16/2019 14:43

1773048 **75105824008** *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007

Taken: 04/02/2019 05:35:00

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 833090 04/12/2019 11:27:00 MLC

	Parameter	Results	Units	RL	Flag	CAS	Bottle
N	**Phenolics, Total Recoverable**	<0.005	mg/L	0.005			02

1773049 **75105824010** *Received:* 04/05/2019

Non-Potable Water *Collected by:* Client Pace Analytical - Da *PO:* DASUB2007

Taken: 04/02/2019 08:00:00

EPA 1657 *Prepared:* 832001 04/08/2019 08:00:00 *Analyzed* 832472 04/09/2019 20:51:00 EMT

	Parameter	Results	Units	RL	Flag	CAS	Bottle
z	**Azinphos-methyl (Guthion)**	<0.0513	ug/L	0.0513	X	86-50-0	04
z	**Chlorpyrifos**	<0.041	ug/L	0.041	X	2921-88-2	04
z	**Demeton**	<0.0513	ug/L	0.0513	X	8065-48-3	04
z	**Diazinon**	<0.050	ug/L	0.050	X	333-41-5	04
z	**Malathion**	<0.0513	ug/L	0.0513	X	121-75-5	04
z	**Parathion, ethyl**	<0.0513	ug/L	0.0513	X	56-38-2	04
z	**Parathion, methyl**	<0.041	ug/L	0.041	X	298-00-0	04

EPA 617 *Prepared:* 831994 04/08/2019 08:00:00 *Analyzed* 832836 04/10/2019 20:50:00 EMT

	Parameter	Results	Units	RL	Flag	CAS	Bottle
z	**Kelthane (Dicofol)**	<0.041	ug/L	0.041	X	115-32-2	03
z	**Methoxychlor**	<0.0103	ug/L	0.0103	X	72-43-5	03
z	**Mirex**	<0.0103	ug/L	0.0103		2385-85-5	03

Sample Preparation

1773045 **75105824002** *Received:* 04/05/2019

DASUB2007

EPA 420.4 1 *Prepared:* 832149 04/09/2019 10:00:00 *Analyzed* 832149 04/09/2019 10:00:00 CRS

N	**Phenol Distillation**	50/50	ml	01

Results

Printed: 04/16/2019 14:43

1773046	**75105824004**								*Received:* 04/05/2019 DASUB2007	
EPA 420.4 1		*Prepared:*	*832149*	*04/09/2019*	*10:00:00*	*Analyzed*	*832149*	*04/09/2019*	*10:00:00*	*CRS*
N **Phenol Distillation**		50/50	ml						01	
1773047	**75105824006**								*Received:* 04/05/2019 DASUB2007	
EPA 420.4 1		*Prepared:*	*832149*	*04/09/2019*	*10:00:00*	*Analyzed*	*832149*	*04/09/2019*	*10:00:00*	*CRS*
N **Phenol Distillation**		50/50	ml						01	
1773048	**75105824008**								*Received:* 04/05/2019 DASUB2007	
EPA 420.4 1		*Prepared:*	*832149*	*04/09/2019*	*10:00:00*	*Analyzed*	*832149*	*04/09/2019*	*10:00:00*	*CRS*
N **Phenol Distillation**		50/50	ml						01	
1773049	**75105824010**								*Received:* 04/05/2019 DASUB2007	
EPA 1657		*Prepared:*	*832001*	*04/08/2019*	*08:00:00*	*Analyzed*	*832472*	*04/09/2019*	*20:51:00*	*EMT*
Organophos. Pesticides		Entered							04	
EPA 614/608/617/1657		*Prepared:*	*831994*	*04/08/2019*	*08:00:00*	*Analyzed*	*831994*	*04/08/2019*	*08:00:00*	*SJN*
Liquid-Liquid Extr. W/Hex Ex		1/975	ml						02	

Results

Printed: 04/16/2019 14:43

1773049 **75105824010** *Received:* 04/05/2019

DASUB2007

EPA 614/608/617/1657		*Prepared:*	*832001*	*04/08/2019*	*08:00:00*	*Analyzed*	*832001*	*04/08/2019*	*08:00:00*	*SJN*
Solvent Extraction	1/975	ml							02	
EPA 617		*Prepared:*	*831994*	*04/08/2019*	*08:00:00*	*Analyzed*	*832836*	*04/10/2019*	*20:50:00*	*EMT*
z **Dicofol/Methoxychlor/Mirex**	Entered								03	

Qualifiers:

X - Standard reads higher than desired.

We report results on an As Received or wet basis unless marked Dry Weight. Unless otherwise noted, testing was performed at Ana-labs corporate laboratory that holds the following Federal and State certificates: EPA Lab Number TX00063, US Department of Agriculture Soil Import Permit P330-17-00117, Texas Commission on Environmental Quality Commercial Drinking Water Lab Approval (Lab ID: TX219), Texas Commission on Environmental Quality NELAP T104704201-19-15, Louisiana Department of Environmental Quality Laboratory Certification (NELAP, LELAP) #02008, Louisiana Department of Health and Hospitals Drinking Water (NELAP) Certificate No LA026, Oklahoma Department of Environmental Quality TNI Laboratory Accreditation Program Certificate No. 2018-126, Arkansas Department of Environmental Quality Certification #18-068-0. The Accredited column designates accreditation by N -- NELAC, or z -- not covered under NELAC scope of accreditation.

These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of Ana-Lab Corp. Unless otherwise specified, these test results meet the requirements of NELAC.

RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.

Bill Peery

Bill Peery, MS, VP Technical Services

Ethics Service Quality ACIL 2005 SEAL OF EXCELLENCE PROGRAM Environmental

Ana-Lab Corp. **P.O. Box 9000** **Kilgore, TX 75663**

Phone 903/984-0551 FAX 903/984-5914 e-Mail corp@ana-lab.com LELAP-accredited #02008

Employee Owned Integrity Caring Continual Improvement

Quality Control

Printed 04/16/2019

Report To

Pace Analytical - Dallas
Melissa McCullough
400 West Bethany Drive
Suite 190
Allen, TX 75013

Account	Project
PAMM-N	869294

Analytical Set 833090 EPA 420.4 1

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Phenolics, Total Recoverable	832149	ND	0.00377	0.005	mg/L	119824625

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Phenolics, Total Recoverable	0.196	0.200	mg/L	98.0	90.0 - 110	119824624
	0.198	0.200	mg/L	99.0	90.0 - 110	119824635
	0.191	0.200	mg/L	95.5	90.0 - 110	119824646

Duplicate

Parameter	Sample	Result	Unknown	Unit	RPD	Limit%
Phenolics, Total Recoverable	1772654	ND	ND	mg/L		20.0
	1772947	0.160	0.161	mg/L	0.623	20.0

ICV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Phenolics, Total Recoverable	0.200	0.200	mg/L	100	90.0 - 110	119824623

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Phenolics, Total Recoverable	832149	0.201	0.206	0.200	90.0 - 110	100	103	mg/L	2.46	20.0

Mat. Spike

Parameter	Sample	Spike	Unknown	Known	Units	Recovery %	Limits %	File
Phenolics, Total Recoverable	1772654	0.195	ND	0.200	mg/L	97.5	90.0 - 110	119824630
	1772947	0.358	0.161	0.200	mg/L	98.5	90.0 - 110	119824633

Analytical Set 832472 EPA 1657

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Azinphos-methyl (Guthion)	832001	ND	0.0461	0.050	ug/L	119811245
Chlorpyrifos	832001	ND	0.0394	0.040	ug/L	119811245
Demeton	832001	ND	0.0377	0.050	ug/L	119811245
Diazinon	832001	ND	0.0432	0.050	ug/L	119811245
Malathion	832001	ND	0.0466	0.050	ug/L	119811245
Parathion, ethyl	832001	ND	0.0292	0.050	ug/L	119811245
Parathion, methyl	832001	ND	0.0395	0.040	ug/L	119811245

CCV

Parameter	Reading	Known	Units	Recover%	Limits%		File
Azinphos-methyl (Guthion)	904	1000	ug/L	90.4	80.0 - 120		119811228
	1770	1000	ug/L	177	80.0 - 120	*	119811251
	1400	1000	ug/L	140	80.0 - 120	*	119811259
Chlorpyrifos	1030	1000	ug/L	103	80.0 - 120		119811228

Quality Control

Printed 04/16/2019

CCV

Parameter	Reading	Known	Units	Recover%	Limits%		File
Chlorpyrifos	1640	1000	ug/L	164	80.0 - 120	*	119811251
	1570	1000	ug/L	157	80.0 - 120	*	119811259
Demeton	1090	1000	ug/L	109	80.0 - 120		119811228
	1710	1000	ug/L	171	80.0 - 120	*	119811251
	1700	1000	ug/L	170	80.0 - 120	*	119811259
Diazinon	1040	1000	ug/L	104	80.0 - 120		119811228
	1850	1000	ug/L	185	80.0 - 120	*	119811251
	2020	1000	ug/L	202	80.0 - 120	*	119811259
Malathion	1030	1000	ug/L	103	80.0 - 120		119811228
	1780	1000	ug/L	178	80.0 - 120	*	119811251
	1900	1000	ug/L	190	80.0 - 120	*	119811259
Parathion, ethyl	983	1000	ug/L	98.3	80.0 - 120		119811228
	1580	1000	ug/L	158	80.0 - 120	*	119811251
	1720	1000	ug/L	172	80.0 - 120	*	119811259
Parathion, methyl	1030	1000	ug/L	103	80.0 - 120		119811228
	1590	1000	ug/L	159	80.0 - 120	*	119811251
	1570	1000	ug/L	157	80.0 - 120	*	119811259

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Azinphos-methyl (Guthion)	832001	0.423	0.702	1.00	0.100 - 166	42.3	70.2	ug/L	49.6	50.0
Chlorpyrifos	832001	0.408	0.413	1.00	0.100 - 109	40.8	41.3	ug/L	1.22	50.0
Demeton	832001	0.313	0.295	1.00	0.100 - 101	31.3	29.5	ug/L	5.92	50.0
Diazinon	832001	0.476	0.519	1.00	0.100 - 106	47.6	51.9	ug/L	8.64	50.0
Malathion	832001	0.419	0.456	1.00	0.100 - 113	41.9	45.6	ug/L	8.46	50.0
Parathion, ethyl	832001	0.428	0.544	1.00	0.100 - 111	42.8	54.4	ug/L	23.9	50.0
Parathion, methyl	832001	0.429	0.453	1.00	0.100 - 109	42.9	45.3	ug/L	5.44	50.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Tributylphosphate		CCV	742	1000	ug/L	74.2	0.100 - 118	119811228
		CCV	1640	1000	ug/L	164 *	0.100 - 118	119811251
		CCV	1710	1000	ug/L	171 *	0.100 - 118	119811259
Triphenylphosphate		CCV	988	1000	ug/L	98.8	0.100 - 147	119811228
		CCV	1490	1000	ug/L	149 *	0.100 - 147	119811251
		CCV	1540	1000	ug/L	154 *	0.100 - 147	119811259
Tributylphosphate	832001	Blank	853	1000	ug/L	85.3	0.100 - 118	119811245
	832001	LCS	412	1000	ug/L	41.2	0.100 - 118	119811246
	832001	LCS Dup	473	1000	ug/L	47.3	0.100 - 118	119811247
Triphenylphosphate	832001	Blank	723	1000	ug/L	72.3	0.100 - 147	119811245
	832001	LCS	345	1000	ug/L	34.5	0.100 - 147	119811246
	832001	LCS Dup	474	1000	ug/L	47.4	0.100 - 147	119811247
Tributylphosphate	1773049	UNKNOWN	1.02	1.03	ug/L	99.0	0.100 - 118	119811252
Triphenylphosphate	1773049	UNKNOWN	0.927	1.03	ug/L	90.0	0.100 - 147	119811252

Analytical Set 832836 **EPA 617**

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Kelthane (Dicofol)	831994	ND	0.0352	0.040	ug/L	119818837
Methoxychlor	831994	ND	0.00897	0.010	ug/L	119818837

Quality Control

Printed 04/16/2019

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Mirex	831994	ND	0.00905	0.010	ug/L	119818837

CCV

Parameter	Reading	Known	Units	Recover%	Limits%		File
Kelthane (Dicofol)	191	200	ug/L	95.3	70.0 - 130		119818835
	280	200	ug/L	140	70.0 - 130	*	119818844
	343	200	ug/L	172	70.0 - 130	*	119818850
Methoxychlor	101	100	ug/L	101	70.0 - 130		119818835
	127	100	ug/L	127	70.0 - 130		119818844
	142	100	ug/L	142	70.0 - 130	*	119818850
Mirex	100	100	ug/L	100	70.0 - 130		119818835
	103	100	ug/L	103	70.0 - 130		119818844
	107	100	ug/L	107	70.0 - 130		119818850

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Kelthane (Dicofol)	831994	1.40	1.45	2.00	0.100 - 130	70.0	72.5	ug/L	3.51	30.0
Methoxychlor	831994	0.983	0.965	1.00	33.6 - 137	98.3	96.5	ug/L	1.85	30.0
Mirex	831994	0.798	0.702	1.00	37.6 - 119	79.8	70.2	ug/L	12.8	30.0

Surrogate

Parameter	Sample	Type	Reading	Known	Units	Recover%	Limits%	File
Decachlorobiphenyl		CCV	94.4	100	ug/L	94.4	10.0 - 150	119818835
		CCV	90.8	100	ug/L	90.8	10.0 - 150	119818844
		CCV	105	100	ug/L	105	10.0 - 150	119818850
Tetrachloro-m-Xylene (Surr)		CCV	103	100	ug/L	103	10.0 - 150	119818835
		CCV	102	100	ug/L	102	10.0 - 150	119818844
		CCV	94.1	100	ug/L	94.1	10.0 - 150	119818850
Decachlorobiphenyl	831994	Blank	67.5	100	ug/L	67.5	10.0 - 150	119818837
	831994	LCS	85.2	100	ug/L	85.2	10.0 - 150	119818838
	831994	LCS Dup	77.3	100	ug/L	77.3	10.0 - 150	119818839
Tetrachloro-m-Xylene (Surr)	831994	Blank	43.4	100	ug/L	43.4	10.0 - 150	119818837
	831994	LCS	61.3	100	ug/L	61.3	10.0 - 150	119818838
	831994	LCS Dup	57.5	100	ug/L	57.5	10.0 - 150	119818839
Decachlorobiphenyl	1773049	UNKNOWN	0.0448	0.103	ug/L	43.5	10.0 - 150	119818841
Tetrachloro-m-Xylene (Surr)	1773049	UNKNOWN	0.0578	0.103	ug/L	56.1	10.0 - 150	119818841

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100%

Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank; CCV - Continuing Calibration Verification; ICV - Initial Calibration Verification

Chain of Custody

Pace Analytical®
www.pacelabs.com

Workorder: 75105824 **Workorder Name:** 548260 **Results Requested By:** 4/17/2019

Report / Invoice To
Melissa McCullough
Pace Analytical Dallas
400 West Bethany Drive
Suite 190
Allen, TX 75013
Phone (972)727-1123
Email: melissa.mccullough@pacelabs.com

Subcontract To
AnaLab

P.O. DASUB2007

State of Sample Origin: TX TPDES

Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Preserved Containers: H2SO4	Preserved Containers: Unpreserved	Requested Analysis: 617/1657	Requested Analysis: 420.1 Phenol	LAB USE ONLY
1	548261	4/1/2019 10:15	75105824002	Water				X	1773045
2	548263	4/1/2019 15:51	75105824004	Water				X	046
3	548265	4/1/2019 21:57	75105824006	Water				X	047
4	548267	4/2/2019 05:35	75105824008	Water				X	048
5	548270	4/2/2019 08:00	75105824010	Water			X		049

Transfers	Released By	Date/Time	Received By	Date/Time
1		4.4.19 1700	FedEx	4.4.19 1700
2	FedEx	4/5/19 105	Kelly Overman	4/5/19 1015
3			Kelly Overman Ana-Lab Corp	

Comments
TPDES Limits See attached list
Phenol RL 10 ug/L

Cooler Temperature on Receipt ____ °C **Custody Seal** [✓ Y] or N **Received on Ice** [✓ Y] or N **Samples Intact** [✓ Y] or N

See Attached for
Tracking # and Temp

2 of 5

869294 CoC Print Group 001 of 001

75105824

Profile List

PASI Dallas Laboratory

Client PCS **Profile N** 6252 **Line I2**

Line Item	Acode	Cmp List	Cmp	Analyte	CAS No.	PQL	MDL	Units	Sig Figs
2	1657 W	1657 W	azin	Azinphos, methyl (Guthion)	86-50-0	0.1	0.01	ug/L	E
			chly	Chlorpyrifos	2921-88-2	0.05	0.02	ug/L	E
			diaz	Diazinon	333-41-5	0.5	0.01	ug/L	E
			prth	Parathion (Ethyl parathion)	56-38-2	0.1	0.02	ug/L	E
			mala	Malathion	121-75-5	0.1	0.01	ug/L	E
			demt	Total Demeton	8065-48-3	0.2	0.01	ug/L	E
	617 W	617 W	meox	Methoxychlor	72-43-5	2	0.02	ug/L	E
			mirx	Mirex	2385-85-5	0.02	0.02	ug/L	E
			dico	Dicofol	115-32-2	1	0.5	ug/L	E

*The MDLs listed are not instrument specific.

*Significant Figures:

Numeric Value - The actual number of significant figures
E (EPA) - Numbers less than 10 have 2 significant figures and numbers greater than or equal to 10 have 3
M (Metals) - Numbers less than 100 have 2 significant figures and numbers greater than or equal to 100 have 3
O (Organics) - Numbers less than 1 have 1 significant figure, numbers less than 100 but not less than 1 have 2 significant figures, and numbers greater than or equal to 100 have 3 significant

869294 CoC Print Group 001 of 001

ORIGIN ID:DNEA (972) 727-1123
SAMPLE RECIEVING
PACE ANALYTICAL
400 BETHANY STE 190

ALLEN, TX 75013
UNITED STATES US

SHIP DATE: 04APR19
ACTWGT: 51.90 LB
CAD: 0508784/CAFE3211

BILL SENDER

TO SAMPLE RECEIVING
ANA LAB
2600 DUDLEY RD

KILGORE TX 75662
(903) 984-0551 REF:
INV:
PO: DEPT:

CP

FedEx
Express

E

FRI – 05 APR 10:30A
PRIORITY OVERNIGHT

TRK# 0201 4901 3087 3322

46 GGGA

75662
TX-US SHV

Therm#: 6444 Corr Fact: 0.0
Temp: 1.2/1.2 °C
Date: 4/5 Time: 1020 Tech: CP

Chain of Custody

Pace Analytical®
www.pacelabs.com

Workorder: 75105824 **Workorder Name:** 548260 **Results Requested By:** ~~4/17/2019~~ Normal TAT

Report / Invoice To

Melissa McCullough
Pace Analytical Dallas
400 West Bethany Drive
Suite 190
Allen, TX 75013
Phone (972)727-1123
Email: melissa.mccullough@pacelabs.com

Subcontract To

AnaLab

P.O. DASUB2007

State of Sample Origin: TX TPDES

Item	Sample ID	Collect Date/Time	Lab ID	Matrix	H2SO4	Unpreserved	420.1 Phenol	LAB USE ONLY
1	548261	4/1/2019 10:15	75105824002	Water			X	1773045
2	548263	4/1/2019 15:51	75105824004	Water			X	046
3	548265	4/1/2019 21:57	75105824006	Water			X	047
4	548267	4/2/2019 05:35	75105824008	Water			X	048
5			;					

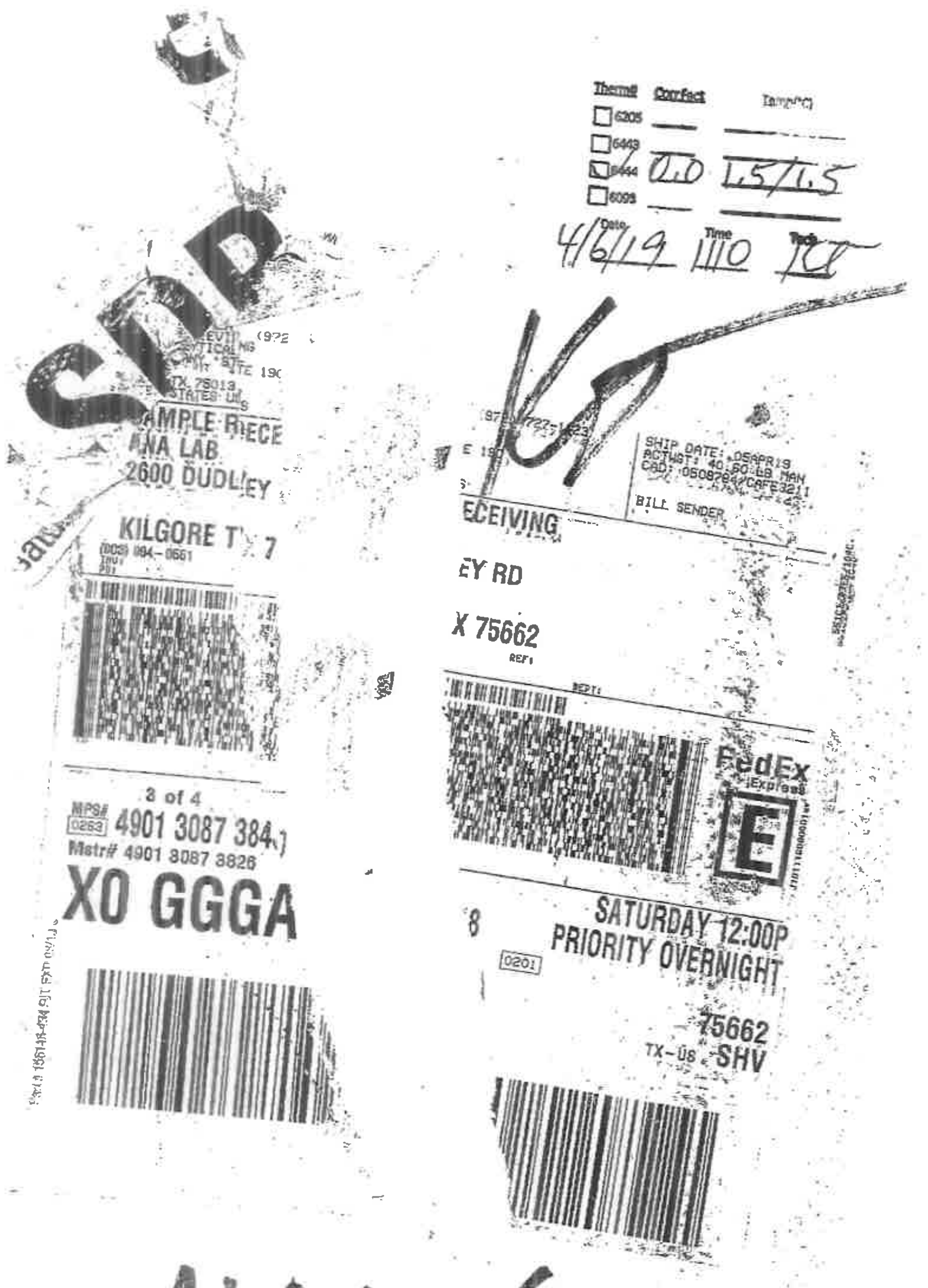
Transfers	Released By	Date/Time	Received By	Date/Time
1		4-5-19 1700	Fedex	4-5-19 1700
2	Fedex	4/6/19 1045	Kathy Tarver Ana-Lab	4/6/19 1045
3				

Comments

Phenol RL 10 ug/L.

Cooler Temperature on Receipt ____ °C **Custody Seal** [✓ Y] or N **Received on Ice** [✓ Y] or N **Samples Intact** [✓ Y] or N

See Attached for
Tracking # and Temp



Therm#	CorrFact	Temp(°C)
☐ 6205		
☐ 6443		
☑ 6444	0.0	1.5/1.5
☐ 6098		

Date 4/6/19 Time 1110 Tech JCC

(972
EVIT
TICAL NG
ITE 190
TX 75013
STATES US

SAMPLE RECE
ANA LAB
2600 DUDLEY
KILGORE TX 7
(903) 984-0551

3 of 4
MPS# 4901 3087 384
Mstr# 4901 3087 3826
XO GGGA

(972 727-1123
E 190

SHIP DATE: 05APR19
ACTWGT: 40.60 LB MAN
CAD: 0508784/CAFE3211

BILL SENDER

ECEIVING
EY RD
X 75662
REF:
DEPT:

FedEx Express
E

SATURDAY 12:00P
PRIORITY OVERNIGHT
0201
75662
TX-US SHV

N010C

Pollution Control Services

Sample Log-In Checklist

548260

PCS Sample No(s) 548260 – 548271 **COC No.**___

Client/Company Name: NBU **Checklist Completed by:** GWF

Sample Delivery to Lab Via:

[✓ Client Drop Off] Commercial Carrier: Bus ___ UPS ___ Lone Star ___ FedEx ___ USPS ___

PCS Field Services: Collection/Pick Up___ Other:___

Sample Kit/Coolers

Sample Kit/Cooler? [✓ Yes] No___ Sample Kit/Cooler: Intact? [✓ Yes] No___

Custody Seals on Sample Kit/Cooler: [✓ Not Present] If Present, Intact ___ Broken ___

Sample Containers Intact; Unbroken and Not Leaking? [✓ Yes] No ___

Custody Seals on Sample Bottles: [✓ Not Present] If Present, Intact ___ Broken ___

COC Present with Shipment or Delivery or Completed at Drop Off? [✓ Yes] No ___

Has COC sample date/time and other pertinent information been provided by client/sampler? [✓ Yes:] No: ___

Has COC been properly Signed when Received/Relinquished? [✓ Yes] No ___

Does COC agree with Sample Bottle Information, Bottle Types, Preservation, etc.? [✓ Yes] No ___

All Samples Received before Hold Time Expiration? [✓ Yes] No ___

Sufficient Sample Volumes for Analysis Requested? [✓ Yes] No ___

Zero Headspace in VOA Vial if Present? Yes ___ No ___

Sample Preservation:

* ***Cooling:*** **Not Required** ___ or [✓ **Required**]

If cooling required, record temperature of submitted samples Observed/Corrected 8 / 5 °C

Is Ice Present in Sample Kit/Cooler? [✓ Yes] ___ No Samples received same day as collected? [✓ Yes] ___ No

Lab Thermometer Make and Serial Number: EX Tech 10093657 Other:___

Acid Preserved Sample - If present, is pH <2? [✓ **Yes**] **No** ___** [✓ H_2SO_4] [✓ HNO_3] ___H_3PO_4

Base Preserved Sample - If present, is pH >12? [✓ Yes] No ___ [✓ NaOH]

Other Preservation:___ If Present, Meets Requirements? Yes___ No___

Sample Preservations Checked by: GWF Date 4/2/19 Time 1210

pH paper used to check sample preservation (PCS log #): 19·023 (HEM pH checked at analysis).

Samples Preserved/Adjusted by Lab:	Lab #	Parameters Preserved	Preservative Used	Log #

Adjusted by Tech/Analyst:___ Date :___ Time:___

Client Notification/ Documentation for "No" Responses Above/ Discrepancies/ Revision Comments

Person Notified: ___ Contacted by:___

Notified Date: ___ Time: ___

Method of Contact: At Drop Off:___ Phone ___ Left Voice Mail ___ E-Mail ___ Fax ___

Unable to Contact ___ Authorized Laboratory to Proceed :___ (Lab Director)

Regarding / Comments:___

Actions taken to correct problems/discrepancies:___

Receiving qualifier needed (*requires client notification above*) Temp. ___ Holding Time ___ Initails: ___

Receiving qualifier entered into LIMS at login Initial/Date: ___

Revision Comments: ___

** Samples submitted for Metals Analysis (except Hex Cr) or Drinking Water for Coliform Bacteria Only are not required to be iced. Samples collected prior day to receipt at the laboratory must meet method specific thermal cooling requirements. "or will be flagged accordingly". Samples delivered the same day as collected may not meet thermal criteria, but shall be considered acceptable if evidence that the chilling process has begun, such as arrival on ice (EPA 815-F-08-006, June 2008) ** Water samples for metals analysis that are not acid preserved prior to shipment may be acceptably preserved by the laboratory on receipt – however, the sample digestion procedure must be delayed for at least 24 hours after preservation by the laboratory.*

North Kuehler

Total Dissolved Solids 437 mg/L 23.5°C 4·11·19 | 1344

Conductivity 902 uS 4·11·19/1344 LK

South Kuehler

Total Dissolved Solids 518 mg/L 24°C 4·11·19 / 1346

Conductivity 1072 uS 4·11·19/1346 LK

Ammonia/Nitrogen

Standard Methods, 22nd edition, Method 4500-NH3 D.

Tech KO

Date 4.16.19

Sample	Date	Dilution	mV	Result / Temp °C	Report mg/L
10mg Std	4.16.19		-25.6	9.15 / 22.6	9.15
NK EFF	4.16.19		99.4	0.0477 / 22.9	<.1=0
SK EFF	4.16.19		57.9	0.318 / 22.8	0.318
					<.1=0
GRN EFF	4.16.19		73.0	0.167 / 23.0	0.167
GRN EFF	4.3.19		89.1	0.0882 / 22.7	<.1=0
GRN EFF	4.5.19		98.6	0.0493 / 22.2	<.1=0
GRN EFF	4.10.19		72.4	0.172 / 22.4	0.172
GRN EFF	4.12.19		86.3	0.0912 / 22.4	<.1=0
SMK EFF	4.16.19		119.9	0.0112 / 22.7	<.1=0
SMK EFF	4.4.19		93.5	0.0640 / 21.9	<.1=0
SMK EFF	4.5.19		105.7	0.0330 / 22.2	<.1=0
SMK EFF	4.10.19		100.8	0.0440 / 22.4	<.1=0
SMK EFF	4.12.19		119.7	0.0118 / 22.6	<.1=0

Standard: 100 % recovery

Spike: 93.96 % recovery

Duplicate: 0.94 % deviation

Spike 0.5 ml of 100 mg/L standard to 25 ml of sample= sample conc. 2 mg/L

spike result / expected spike result x spike vol. / original vol. x 100% expected spike result=sample result + standard conc.

Ammonia/Nitrogen

Standard Methods, 22nd edition, Method 4500-NH3 D.

Tech VOD

Date 4.16.19

Sample	Date	Dilution	mV	Result / Temp °C	Report mg/L
NK Inf	4.16.19		0.6	3.23 /22.4	3.23
NK Inf dup	4.16.19		1.0	3.17 /22.6	3.17
NK Inf sp	4.16.19		-9.3	4.79/22.6	~~[illegible]~~ 4.79
10mg std	4.16.19		-25.7	9.15/22.0	9.15

3.2

Standard: 100 % recovery

Spike: 93.96 % recovery

Duplicate: 0.94 % deviation

Spike 0.5 ml of 100 mg/L standard to 25 ml of sample= sample conc. 2 mg/L

spike result / expected spike result x spike vol. / original vol. x 100% expected spike result=sample result + standard conc.

Total Phosphorous
Hach Method 8190
PhosVer 3 with Acid Persulfate Digestion

Technician: JK Date: 4-12-19

SAMPLE	Date Collected	Date Analysied & pH	Results as P	Blank Correction Factor	Adjusted Result	Dilution Factor	Total P mg/l
Blank	4-12-19	4-12-19	0.05				
Standard	"	"	0.38	0.05	0.33		0.33
NK Eff	"	"	0.43	0.05	0.38	5	1.90
NK Eff Dup.	"	"	0.43	0.05	0.38	5	1.90
NK Eff. Spike	"	"	0.60	0.05	0.55	5	2.75
SK Eff	"	"	0.56	0.05	0.51	5	JK ~~0.80~~ 2.55
SMK Eff	"	"	0.21	0.05	0.16	5	0.80
Grn Eff	"	"	0.76	0.05	0.71	5	3.55
NK Perm	"	"	0.55	0.05	0.50	12.5	6.25
				~~0.05~~ JK			
NK Gravity	"	"	0.44	0.05	0.39	12.5	4.88

) 1.90

nitrate
NK 3.23x5
SK 5.41 x5
grn 5.20x5
NKperm 0.904
SKperm 0.848

Standard: 100 **% Recovery** (5 mls of 1.0 mg/L Std. to vial = 0.33 mg/L P)

Spike: 101.10 **% Recovery** (0.3 mls of 16.31 mg/L Std. as "P" to x mls of sample)

1.90 x5 +4.893 ÷ 5.3 = 2.72

Duplicate: 0 **% Deviation**

inf
ammonia
grn 1.47x2
NK 1.24x25
SK 1.44x8

Theoretical Concentration Formula: [(Cu x Vu) + (Cs x Vs)] / (Vu + Vs)

[(Ave. of Sx and Dup. mg/l X x ml) + (16.31 mg/l x 0.3 mL)] / (x mL + 0.3 ml) = Theoretical Concentration

(Spike Result/Theoretical Concentration) x 100 = % Rec. of Spike

Cu = measured conc. Of unknown Sx, Vu = volume of unknown Sx, Cs = Conc. Of standard, Vs = volume of standard,

TOTAL SUSPENDED SOLIDS

DATE COLLECTED 4.17.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1415
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: Blank

#	# 42
1.	1. 7141
1.	1. 7146
	-0.0005

DATE COLLECTED 4.16.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1415 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: GRN EFF

# 43	# 44
1. 6629	1. 6713
1. 6623	1. 6703
0.0006	0.0010
	MG/L: 1.6

DATE COLLECTED 4.16.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1415 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: GRN EFF dup

# 45	# 46
1. 6422	1. 6753
1. 6412	1. 6742
0.0010	0.0011
MG/L: 2.1	

DATE COLLECTED 4.16.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1415 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: NK EFF

# 47	# 48
1. 6655	1. 6807
1. 6648	1. 6801
0.0007	0.0006
	MG/L: 1.3

DATE COLLECTED 4.16.19 TIME INC 1120 KD
DATE ANALYZED 4.17.19 TIME WT.#2 1415 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: SK EFF

# 49	# 50
1. 6553	1. 6550
1. 6533	1. 6527
0.0020	0.0023
MG/L: 4.3	

DATE COLLECTED 4.16.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1416 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: MCK EFF

# 51	# 52
1. 6591	1. 6836
1. 6544	1. 6815
0.0047	0.0021
	MG/L: 6.8

DATE COLLECTED 4.17.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1415 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: GRN EFF

# 53	# 54
1. 6999	1. 7000
1. 6978	1. 6975
0.0021	0.0025
MG/L: 4.6	

DATE COLLECTED 4.17.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1415 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: NK EFF

55	56
#	#
1. ~~691~~ 6923	1. 6903
1. 6911	1. 6895 = 0.0008
0.0012	MG/L: 2.0

DATE COLLECTED 4.17.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1415 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: SL EFF

57	58
1. 6940	1. 6890
1. 6919	1. 6871
0.0021	0.0019
MG/L: 4.0	

DATE COLLECTED 4.17.19 TIME INC 1120 KO
DATE ANALYZED 4.17.19 TIME WT.#2 1415 KO
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: MCK EFF

59	60
1. 6827	1. 7041
1. 6810	1. 7007
0.0017	0.0034
	MG/L: 5.1

Duplicate %Deviation: 13.5

TOTAL SUSPENDED SOLIDS

DATE COLLECTED 4.17.19 TIME INC 1120hrs
DATE ANALYZED 4.17.19 TIME WT.#2 1415hrs
MLS/ SAMPLE 500
SAMPLE TYPE/LOCATION: Blank

#	# 61
1.	1.6704
1.	1.6708
	−0.6004

DATE COLLECTED 4.17.19 TIME INC 1120hrs
DATE ANALYZED 4.17.19 TIME WT.#2 1415hrs
MLS/ SAMPLE 50
SAMPLE TYPE/LOCATION: GRN Inf

# 62	# 63
1.7263	1.7049
1.7001	1.6863
0.0262	0.0186
	MG/L: 448.0

DATE COLLECTED 4.17.19 TIME INC 1120hrs
DATE ANALYZED 4.17.19 TIME WT.#2 1415hrs
MLS/ SAMPLE 50
SAMPLE TYPE/LOCATION: GRN Inf dup

# 64	# 65
1.7146	1.7289
1.6929	1.7106
0.0217	0.0183
	MG/L: 400.0

DATE COLLECTED 4.17.19 TIME INC 1120hrs
DATE ANALYZED 4.17.19 TIME WT.#2 1415hrs
MLS/ SAMPLE 50
SAMPLE TYPE/LOCATION: WK Inf

# 66	# 67
1.6932	1.7147
1.6793	1.7011
0.0139	0.0136
	MG/L: 275.0

DATE COLLECTED 4.17.19 TIME INC 1120hrs
DATE ANALYZED 4.17.19 TIME WT.#2 1415hrs
MLS/ SAMPLE 50
SAMPLE TYPE/LOCATION: Sc Inf

# 68	# 69
1.6878	1.6800
1.6776	1.6703
0.0102	0.0097
	MG/L: 199.0

DATE COLLECTED 4.17.19 TIME INC 1120hrs
DATE ANALYZED 4.17.19 TIME WT.#2 1415hrs
MLS/ SAMPLE 50
SAMPLE TYPE/LOCATION: Smck Inf

# 70	# 71
1.7068	1.7162
1.6985	1.7071
0.0083	0.0091
	MG/L: 174.0

DATE COLLECTED TIME INC
DATE ANALYZED TIME WT.#2
MLS/ SAMPLE
SAMPLE TYPE/LOCATION:

#	#
1.	1.
1.	1.
	MG/L:

DATE COLLECTED TIME INC
DATE ANALYZED TIME WT.#2
MLS/ SAMPLE
SAMPLE TYPE/LOCATION:

MG/L:

DATE COLLECTED TIME INC
DATE ANALYZED TIME WT.#2
MLS/ SAMPLE
SAMPLE TYPE/LOCATION:

MG/L:

DATE COLLECTED TIME INC
DATE ANALYZED TIME WT.#2
MLS/ SAMPLE
SAMPLE TYPE/LOCATION:

MG/L:

Duplicate %Deviation: 5.66

E. coli

QUANTI-TRAY METHOD: [✓ COLILERT-18] OR COLILERT-24 (SM 9223 B)
(Circle one)

COLLECTED AND RELINQUISHED BY, DATE/TIME: Sam 4.11.19 / [illegible] Gruene 4.11.19 / [illegible] } relinquished @ 120[illegible] 4.11.1[illegible]
RECEIVED BY, DATE/TIME: JH 1325 4-11-19

COLLECTED AND RELINQUISHED BY, DATE/TIME: SKSTP 4-11-19 / NKSTP 4-11-19 / [illegible] } RELINQUISH 4-11-19/1322/[illegible]
RECEIVED BY, DATE/TIME: JH 1325 4-11-19

SAMPLES ANALYZED BY: JH
INCUBATION DATE/TIME: 4-11-19 1330
TEST VALIDATED BY: JH
DATE/TIME: 4-12-19 0730

COMMENTS: SAMPLES ARE ICED IN TRANSIT / REFIGERATED UPON ARRIVAL AT THE LAB

SAMPLE IDENTIFICATION	COLLECTION INFORMATION		NBU SAMPLE #	# WELLS POSITIVE		MPN	FINAL COUNT E. COLI / 100 MLS
	DATE	TIME		LRG	SML		
Blank	4-11-19	1325	343	0	0		0
Gruene 100 ml	4.11.19	1123	344	5	0		5.2
North Kuehler 100 ml	4-11-19	1319	345	0	0		0
South Kuehler 100 ml	4-11-19	1315	346	0	0		0
Sam McKenzie 100 ml	4.11.19	1021	347	5	0		5.2
Sam McKenzie 100 ml dup	4.11.19	1021	348	4	0		4.1
Gruene 10%	4.11.19	1123	349	1	0	x10	10.0
Pos. (first Tues. every month)							

> 4[illegible]

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: Sample ID: NKSTP Effluent 04151974 Matrix: Non-Potable Water Date/Time Taken: 04/15/2019 1009	**PCS Sample #: 549876** **Page 1 of 1** Date/Time Received: 04/15/2019 10:55 Report Date: 04/26/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Flag	Result	Units	RL	Analysis Date/Time	Method	Analyst
Cyanide, Amenable	+	See Attached					Pace Analytical Services - Dallas

***Quality Statement:** All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

\+ *Subcontract Work - NELAP Certified Lab*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: Sample ID: NKSTP Effluent 04151975 Matrix: Non-Potable Water Date/Time Taken: 04/15/2019 1009	**PCS Sample #: 549877** **Page 1 of 1** Date/Time Received: 04/15/2019 10:55 Report Date: 04/22/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Oil and Grease (H.E.M.)	<5.0	mg/L	5	04/19/2019 11:00	EPA 1664	EMV

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Oil and Grease (H.E.M.)	5	18	N/A	N/A	N/A	N/A	88	78 - 114

Quality Statement: *All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

NELAP ACCREDITED TNI LABORATORY

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: Sample ID: SKSTP Effluent 04151976 Matrix: Non-Potable Water Date/Time Taken: 04/15/2019 1006	**PCS Sample #: 549878** **Page 1 of 1** Date/Time Received: 04/15/2019 10:55 Report Date: 04/22/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Oil and Grease (H.E.M.)	<5.0	mg/L	5	04/19/2019 11:00	EPA 1664	EMV

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Oil and Grease (H.E.M.)	5	18	N/A	N/A	N/A	N/A	88	78 - 114

***Quality Statement:** All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.*

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Report of Sample Analysis

Client Information	Sample Information	Laboratory Information
Trish Soechting New Braunfels Utilities P.O. Box 310289 New Braunfels, TX 78131-0289	Project Name: Sample ID: GSTP Effluent 04151977 Matrix: Non-Potable Water Date/Time Taken: 04/15/2019 0915	**PCS Sample #: 549879** **Page 1 of 1** Date/Time Received: 04/15/2019 10:55 Report Date: 04/22/2019 Approved by: Chuck Wallgren Chuck Wallgren, President

Test Description	Result	Units	RL	Analysis Date/Time	Method	Analyst
Oil and Grease (H.E.M.)	<5.0	mg/L	5	04/19/2019 11:00	EPA 1664	EMV

Quality Assurance Summary

Test Description	Precision	Limit	LCL	MS	MSD	UCL	LCS	LCS Limit
Oil and Grease (H.E.M.)	5	18	N/A	N/A	N/A	N/A	88	78 - 114

Quality Statement: ***All supporting quality control data adhered to data quality objectives and test results meet the requirements of NELAC unless otherwise noted as flagged exceptions or in a case narrative attachment. Reports with full quality data deliverables are available on request.***

These analytical results relate only to the sample tested.
All data is reported on an "As Is" basis unless designated as "Dry Wt."
RL = Reporting Limits

QC Data Reported in %, Except BOD in mg/L

POLLUTION CONTROL SERVICES

Chain of Custody Number
549876

MULTIPLE SAMPLE ANALYSIS REQUEST AND CHAIN OF CUSTODY FORM

Stamp 1st sample and COC as same number

CUSTOMER INFORMATION	**REPORT INFORMATION**		
Name: New Braunfels Utilities	Attention: Trish Soechting	Phone: (830) 608-8905	Fax: (830) 626-1361

SAMPLE INFORMATION

Project Information:

Report "Soils" ☐ As Is ☐ Dry Wt.

Collected By: L. KING

Requested Analysis

Instructions/Comments:

Matrix: DW-Drinking Water; NPW-Non-potable water; WW-Wastewater; LW-Liquid Waste

Client / Field Sample ID	Collected Date	Collected Time	Field Chlorine Residual mg/L	Composite or Grab	Matrix	Container Type	Container Number	Container Preservative	CN_A	FOG							PCS Sample Number
NKSTP EFFLUENT 04151974	Start: 4-15-19 End: —	Start: 1009 End: —		☐ C ☒ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☒ P ☐ G ☐ O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☒ NaOH ☒ ICE ☐	X								549876 ☐S ☐B ☐N ☐HEM Other:
NKSTP EFFLUENT 04151975	Start: 4-15-19 End: —	Start: 1009 End: —		☐ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐ P ☐ G ☐ O		☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐		X							549877 ☐S ☐B ☐N ☐HEM Other:
SKSTP EFFLUENT 04151976	Start: 4-15-19 End: —	Start: 1006 End: —		☐ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐ P ☐ G ☐ O		☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐		X							549878 ☐S ☐B ☐N ☐HEM Other:
GSTP EFFLUENT 04151977	Start: 4-15-19 End: —	Start: 0915 End: —		☐ C ☐ G	☐ DW ☐ NPW ☒ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐ P ☐ G ☐ O		☒ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐		~~X~~							549879 ☐S ☐B ☐N ☐HEM Other:
~~[illegible] McKENZIE EFFLUENT 04151978~~ LW	Start: ~~4-15-19~~ End:	Start: End:		☐ C ☐ G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐ P ☐ G ☐ O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐		~~X~~ LW							☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐ C ☐ G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐ P ☐ G ☐ O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐									☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐ C ☐ G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐ P ☐ G ☐ O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐									☐S ☐B ☐N ☐HEM Other:
	Start: End:	Start: End:		☐ C ☐ G	☐ DW ☐ NPW ☐ WW ☐ Soil ☐ Sludge ☐ LW ☐ Other	☐ P ☐ G ☐ O		☐ H_2SO_4 ☐ HNO_3 ☐ H_3PO_4 ☐ NaOH ☐ ICE ☐									☐S ☐B ☐N ☐HEM Other:

Required Turnaround: ☒ Routine (6-10 days) *EXPEDITE:* (See Surcharge Schedule) ☐ < 8 Hrs ☐ < 16 Hrs ☐ < 24 Hrs ☐ 5 days ☐ Other: ________ *Rush Charges Authorized by:*

Sample Archive/Disposal: ☐ Laboratory Standard ☐ Hold for client pick up **Container Type:** P = Plastic, G = Glass, O = Other Carrier ID:

Relinquished By:	Larry King	Date:	4-15-19	Time:	1055	Received By:		Date:	4/15/19	Time:	1055
Relinquished By:		Date:	4.15.19	Time:	0938	Received By:	Larry King	Date:	4-15-19	Time:	0938

Rev. Multiple Sample COC 20120201

1532 Universal City Blvd., Ste. 100, Universal City, Texas 78148
P (210) 340-0343 or (800) 880-4616 - F (210) 658-7903

Login at www.pcslab.net

~~TCEQ NELAP T104704361-TX~~
4/15/19

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
400 West Bethany Drive - Suite 190
Allen, TX 75013
(972)727-1123

April 25, 2019

Chuck Wallgren
Pollution Control Services
1532 Universal City Blvd. #100
Universal City, TX 78148

RE: Project: 549876
Pace Project No.: 75106706

Dear Chuck Wallgren:

Enclosed are the analytical results for sample(s) received by the laboratory on April 17, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Melissa McCullough

Melissa McCullough
melissa.mccullough@pacelabs.com
(972)727-1123
Project Manager

Enclosures

cc: Michael Klang

CERTIFICATIONS

Project: 549876
Pace Project No.: 75106706

Dallas Certification IDs:

400 West Bethany Dr Suite 190, Allen, TX 75013
Florida Certification #: E871118
EPA# TX00074
Texas T104704232-18-26
Texas Certification #: T104704232-18-26

Kansas Certification #: E-10388
Arkansas Certification #: 88-0647
Oklahoma Certification #: 8727
Louisiana Certification #: 30686
Iowa Certification #: 408

SAMPLE SUMMARY

Project: 549876
Pace Project No.: 75106706

Lab ID	Sample ID	Matrix	Date Collected	Date Received
75106706001	549876	Water	04/15/19 10:09	04/17/19 10:34

SAMPLE ANALYTE COUNT

Project: 549876
Pace Project No.: 75106706

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
75106706001	549876	SM 4500-CN-E	SRT	1	PASI-D
		SM 4500-CN-G	SRT	1	PASI-D

ANALYTICAL RESULTS

Project: 549876
Pace Project No.: 75106706

Sample: 549876 **Lab ID: 75106706001** Collected: 04/15/19 10:09 Received: 04/17/19 10:34 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500CNE Cyanide, Total	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-C							
Cyanide	ND	ug/L	10.0	1	04/24/19 15:08	04/24/19 17:21	57-12-5	
4500CNG Cyanide, Amenable	Analytical Method: SM 4500-CN-G Preparation Method: SM 4500-CN-C							
Amenable Cyanide	ND	ug/L	10.0	1	04/25/19 11:51	04/25/19 12:04	57-12-5	

QUALITY CONTROL DATA

Project: 549876
Pace Project No.: 75106706

QC Batch: 116547
QC Batch Method: SM 4500-CN-C
Associated Lab Samples: 75106706001
Analysis Method: SM 4500-CN-E
Analysis Description: 4500CNE Cyanide, Total

METHOD BLANK: 525086
Matrix: Water
Associated Lab Samples: 75106706001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/24/19 17:19	

LABORATORY CONTROL SAMPLE: 525087

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	100	106	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 525088 525089

Parameter	Units	75106678007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	100	100	73.1	66.8	73	67	85-115	9	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 525090 525091

Parameter	Units	75106763002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	0.015 mg/L	100	100	27.1	24.8	12	10	85-115	9	20	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 549876
Pace Project No.: 75106706

QC Batch: 116681
QC Batch Method: SM 4500-CN-C
Associated Lab Samples: 75106706001

Analysis Method: SM 4500-CN-G
Analysis Description: 4500CNG Cyanide, Amenable

METHOD BLANK: 525697
Associated Lab Samples: 75106706001

Matrix: Water

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Amenable Cyanide	ug/L	ND	10.0	04/25/19 12:04	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALIFIERS

Project: 549876
Pace Project No.: 75106706

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The Nelac Institute

LABORATORIES

PASI-D	Pace Analytical Services - Dallas

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 549876
Pace Project No.: 75106706

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
75106706001	549876	SM 4500-CN-C	116547	SM 4500-CN-E	116602
75106706001	549876	SM 4500-CN-C	116681	SM 4500-CN-G	116682

Pace Analytical®	Document Name: Sample Condition Upon Receipt	Document Revised: 03-14-19 Page 1 of 1
	Document No.: F-DAL-C-001-rev.9	Issuing Authority: Pace Dallas Quality Office

Sample Condition Upon Receipt

☑ Dallas ☐ Ft Worth

WO# : 75106706

75106706

Client Name: PCS Project Work order: __

Courier: FedEX ☐ UPS ☐ USPS ☐ Client ☐ LSO ☑ PACE ☐ Other: ______

Tracking #: ______

Custody Seal on Cooler/Box: Yes ☐ No ☑ **Packing Material:** Bubble Wrap/Bags ☑ Foam ☐ None ☐ Other ☐

Received on ice: Yes ☑ No ☐ **Type of Ice:** Wet ☑ Blue ☐

Thermometer Used: IR-11 **Cooler Temp °C:** 5.0 (Recorded) 0.0 (Correction Factor) 5.0 (Actual)

Temperature should be above freezing to 6°C

Chain of Custody relinquished	Yes ☑ No ☐
Sampler name & signature on COC	Yes ☐ No ☑
Short HT analyses (<72 hrs)	Yes ☐ No ☑
Sufficient Volume received	Yes ☑ No ☐
Correct Container used	Yes ☑ No ☐
Container Intact	Yes ☑ No ☐
Sample pH Acceptable pH Strips: 141631 Residual Chlorine Present Cl Strips: 141364 Sulfide Present Lead Acetate Strips: 141365	Yes ☑ No ☐ NA ☐ Yes ☐ No ☑ NA ☐ Yes ☐ No ☑ NA ☐
Are soil samples (volatiles, TPH) received in 5035A Kits	Yes ☐ No ☐ NA ☑
Unpreserved 5035A soil frozen within 48 hrs	Yes ☐ No ☐ NA ☑
Headspace in VOA (>6mm)	Yes ☐ No ☐ NA ☑
Project sampled in USDA Regulated Area: State Sampled: TX	Yes ☑ No ☐
Non-Conformance(s):	Yes ☐ No ☑

POLLUTION CONTROL SERVICES

1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318
Facsimilie 210.658.7903
210.340.0343

CHAIN OF CUSTODY & SUBCONTRACT TRACKING SHEET

TO: Pace Analytical Services, Inc.
400 W Bethany Rd, Ste 190
Allen, TX 75013

Relinquished by: Greg Felux
Date/Time: 4/16/2019 @ 1700
Received by: Alyssa Trac
Date/Time: 4/17/19 0634

PCS#	Date	Time	Analysis Requested	Pres	T. A. T.
549876	04/15/2019	1009	Cyanide, Amenable	NAOH	Std -001

Comments/Special Instructions:

Unless otherwise requested, send results and invoice to:

Chuck Wallgren
Pollution Control Services
1532 Universal City Blvd, Suite 100
Universal City, TX 78148-3318

WO#: 75106706
PM: MLM Due Date: 05/01/19
CLIENT: PCS

Authorized by:

Date: 4/16/19

Pollution Control Services

Sample Log-In Checklist

PCS Sample No(s) 549876 – 549876 **COC No.** 549876

Client/Company Name: ABU **Checklist Completed by:** Gur

Sample Delivery to Lab Via:
Client Drop Off ✓ Commercial Carrier: Bus ____ UPS ____ Lone Star ____ FedEx ____ USPS ____
PCS Field Services: Collection/Pick Up____ Other:________

Sample Kit/Coolers
Sample Kit/Cooler? Yes ✓ No____ Sample Kit/Cooler: Intact? Yes ✓ No___
Custody Seals on Sample Kit/Cooler: Not Present ✓ If Present, Intact ___ Broken ___
Sample Containers Intact; Unbroken and Not Leaking? Yes ✓ No ___
Custody Seals on Sample Bottles: Not Present ✓ If Present, Intact ___ Broken ___
COC Present with Shipment or Delivery or Completed at Drop Off? Yes ✓ No ___
Has COC sample date/time and other pertinent information been provided by client/sampler? Yes: ✓ No: ___
Has COC been properly Signed when Received/Relinquished? Yes ✓ No ___
Does COC agree with Sample Bottle Information, Bottle Types, Preservation, etc.? Yes ✓ No ___
All Samples Received before Hold Time Expiration? Yes ✓ No ___
Sufficient Sample Volumes for Analysis Requested? Yes ✓ No ___
Zero Headspace in VOA Vial if Present? Yes ___ No ___

Sample Preservation:
* ***Cooling:*** **Not Required** ______ or **Required** ✓
If cooling required, record temperature of submitted samples Observed/Corrected 6 / 3 °C
Is Ice Present in Sample Kit/Cooler? ✓ Yes ____ No Samples received same day as collected? ✓ Yes ____ No
Lab Thermometer Make and Serial Number: EX Tech 10093657 Other:________

Acid Preserved Sample - If present, is pH <2? Yes ✓ No ___ ** ✓ H_2SO_4 ____ HNO_3 ____ H_3PO_4
Base Preserved Sample - If present, is pH >12? Yes ✓ No ___ ✓ NaOH
Other Preservation:________ If Present, Meets Requirements? Yes____ No____
Sample Preservations Checked by: Gur Date 4/15/19 Time 1122
pH paper used to check sample preservation (PCS log #): 14023 (HEM pH checked at analysis).
Samples Preserved/Adjusted by Lab: Lab # Parameters Preserved Preservative Used Log #

Adjusted by Tech/Analyst:________ Date :________ Time:________

Client Notification/ Documentation for "No" Responses Above/ Discrepancies/ Revision Comments
Person Notified: ________ Contacted by:________
Notified Date: ________ Time: ________
Method of Contact: At Drop Off:____ Phone ___ Left Voice Mail ___ E-Mail ____ Fax ____
Unable to Contact ____ Authorized Laboratory to Proceed :________(Lab Director)
Regarding / Comments:________

Actions taken to correct problems/discrepancies:________

Receiving qualifier needed (*requires client notification above*) Temp. ___ Holding Time ___ Initails: ________
Receiving qualifier entered into LIMS at login Initial/Date: ________
Revision Comments: ________

** Samples submitted for Metals Analysis (except Hex Cr) or Drinking Water for Coliform Bacteria Only are not required to be iced. Samples collected prior day to receipt at the laboratory must meet method specific thermal cooling requirements, "or will be flagged accordingly". Samples delivered the same day as collected may not meet thermal criteria, but shall be considered acceptable if evidence that the chilling process has begun, such as arrival on ice (EPA 815-F-08-006 June 2008) ** Water samples for metals analysis that are not acid preserved prior to shipment may be acceptably preserved by the laboratory on receipt -- however. the sample digestion procedure must be delayed for at least 24 hours after preservation by the laboratory.*

ATTACHMENT N

EFFLUENT PARAMETERS ABOVE THE MAL

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337

Table 6.0(1) Effluent Paramaters Above the MAL

South Kuehler 2018				
Pollutant	**Concentration**	**MAL**	**Units**	**Date**
Arsenic	**0.6**	0.5	ug/L	4/9/2018
Copper	**6.0**	2	ug/L	4/9/2018
Nickel	**2.0**	2	ug/L	4/9/2018
Zinc	**63.0**	5	ug/L	4/9/2018
Chloroform	**26.3**	10	ug/L	4/9/2018
Dichlorobromomethane	**15.0**	10	ug/L	4/9/2018
Aluminum	**240.0**	2.5	ug/L	4/9/2018
Barium	**21.0**	3	ug/L	4/9/2018
Fluoride	**600.0**	500	ug/L	4/9/2018
Nitrate-Nitrogen	**26400.0**	100	ug/L	4/9/2018
TTHM (Total Trihalomethanes)	**49.1**	10	ug/L	4/9/2018
Arsenic	**0.6**	0.5	ug/L	10/4/2018
Copper	**11.0**	2	ug/L	10/4/2018
Zinc	**67.0**	5	ug/L	10/4/2018
Aluminum	**270.0**	2.5	ug/L	10/4/2018
Barium	**19.0**	3	ug/L	10/4/2018

ATTACHMENT O

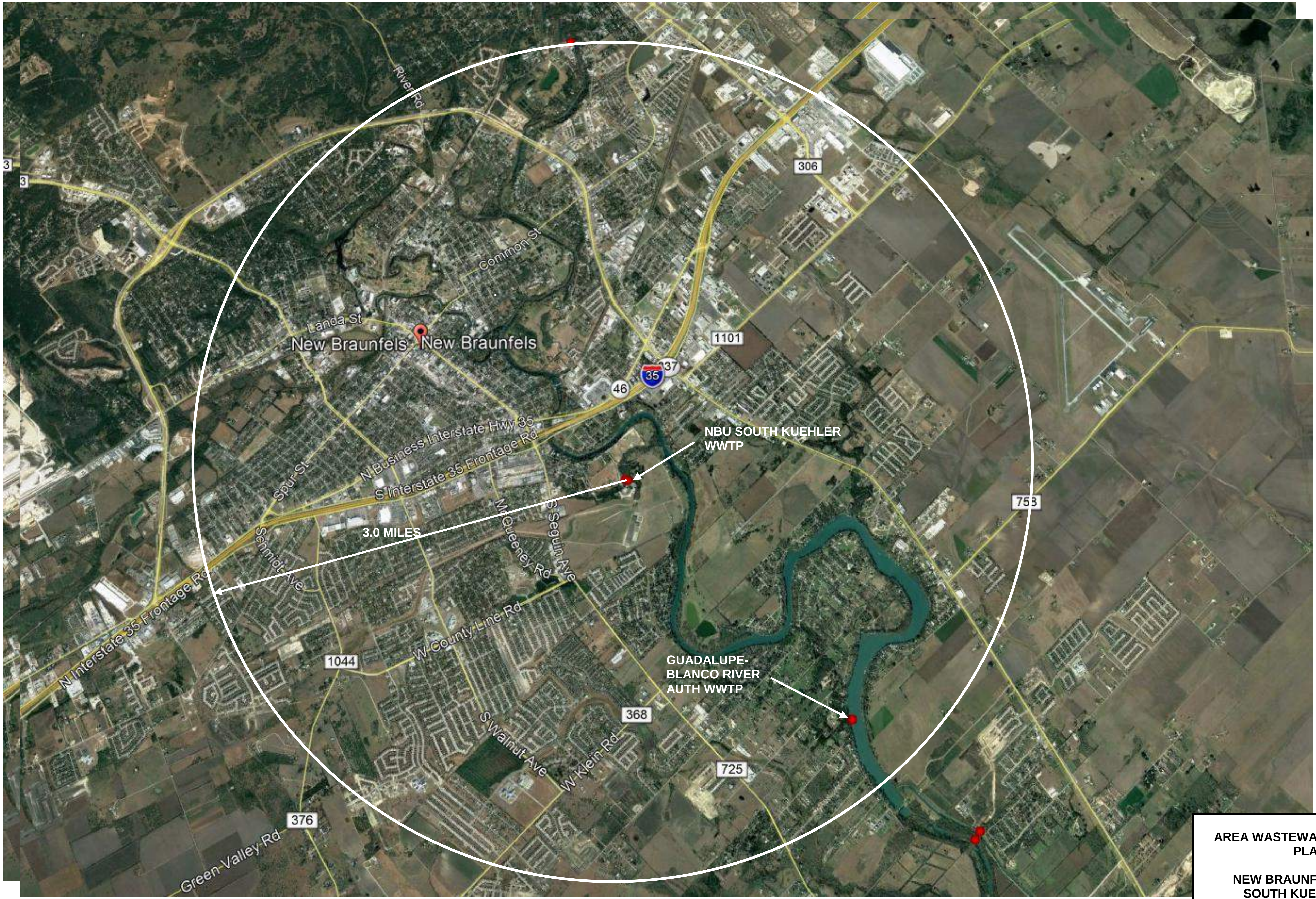
REGIONALIZATION SURVEYS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

JONES | CARTER

Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337



AREA WASTEWATER TREATMENT PLANTS

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WWTP
PERMIT NO. WQ0010232001

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337

JONES|CARTER

1575 Sawdust Road, Suite 400
The Woodlands, Texas 77380-3795
Tel: 281.363.4039
Fax: 281.363.3459
www.jonescarter.com

June 6, 2019

Ms. Debbie Magin, Director of Water Quality Services
Guadalupe-Blanco River Authority
933 East Court Street
Seguin, TX 78155

Re: Wastewater Treatment Plant Regionalization Inquiry
New Braunfels Utilities
Comal County, Texas

Dear Ms. Magin:

New Braunfels Utilities is applying for a TPDES permit amendment and is seeking to determine if there are any wastewater treatment plants or collection systems within three (3) miles of the South Kuehler WWTP have capacity or are willing to expand to provide capacity for the ultimate needs of the proposed wastewater treatment plant. You have been identified as operating a wastewater collection system and possibly a wastewater treatment plant within three (3) miles of the service area for the South Kuehler WWTP. It would be greatly appreciated if you could complete the attached survey and either fax, e-mail (sbarry@jonescarter.com) or mail this questionnaire to me no later than June 24, 2019.

Please feel free to call 281-363-4039 should you have any questions.

Sincerely,

Steve Barry, P.E.

SGB/
K:\05487\05487-0005-00 North & South Kuehler Wastewater Treatme\2 Design Phase\005 - WWTP TPDES Permit Major Amendment\01 - Permit Preparation\CapacitySurvCvr 2010.doc
Attachment

WASTEWATER TREATMENT CAPACITY AVAILABILITY SURVEY

District or Company Name Guadalupe-Blanco River Authority

New Braunfels Utilities is seeking to determine if there are any wastewater treatment plants within three (3) miles that have capacity or are willing to expand to provide capacity for the ultimate needs of New Braunfels Utilities. Following is the projected flow for the New Braunfels Utilities South Kuehler.

Month/Year	Flow (gpd)
Jan-20	2,982,250
Jan-21	3,171,490
Jan-22	3,364,330
Jan-23	3,561,730
Jan-24	6,340,930
Jan-25	6,657,010
Jan-30	8,379,610
Jan-35	10,422,380
Jan-40	12,802,160
Jul-44	15,400,000

	Yes	No
1. Do you currently have wastewater treatment plant capacity available to serve the ultimate needs of New Braunfels Utilities?		✓
2. Are you willing to expand your wastewater treatment plant to provide capacity to serve the ultimate needs of New Braunfels Utilities?		✓
3. If you are willing to expand your wastewater treatment plant provide capacity to serve the ultimate needs of New Braunfels Utilities, can you meet the time constraints outlined in the above table?		✓

Michael Urrutia
Signature

6/14/19
Date

Michael Urrutia
Print Name

Deputy Exec. Mgr. Operations
Title

830-379-5822
Phone Number

ATTACHMENT P

FLOOD PLAIN MAP

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

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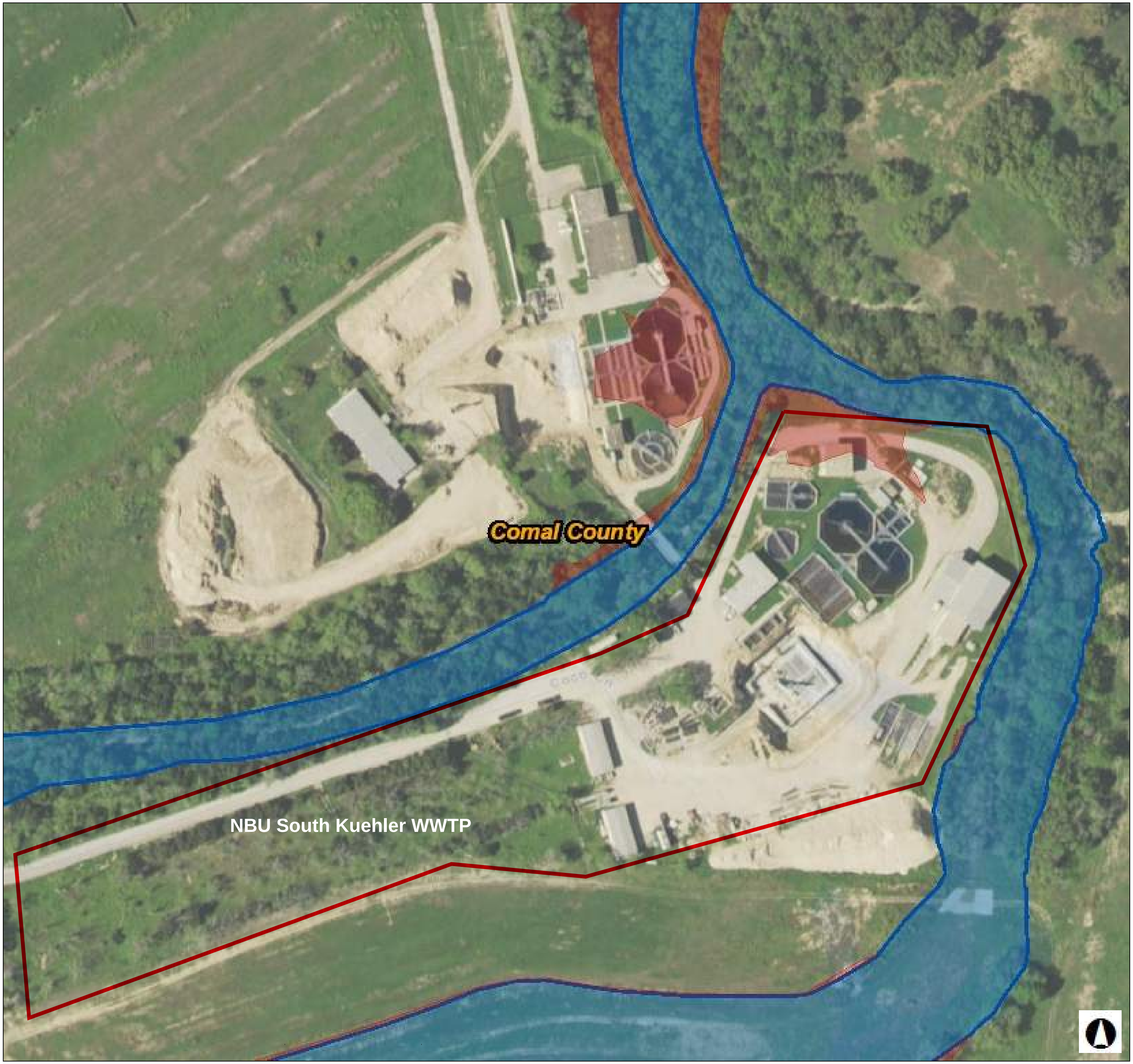
Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337



LEGEND

FEMA

FLD_ZONE, ZONE_SUBTY

- 🟦 Floodway
- 🟥 100 Year
- 🟥 100 Year
- 🟩 100 Year Overflow
- 500 Year
- 500 Year

FEMA FLOOD PLAIN MAP

NEW BRAUNFELS UTILITIES SOUTH KUEHLER WWTP

PERMIT NO. WQ0010232001

JONES | CARTER

Notes

ATTACHMENT Q

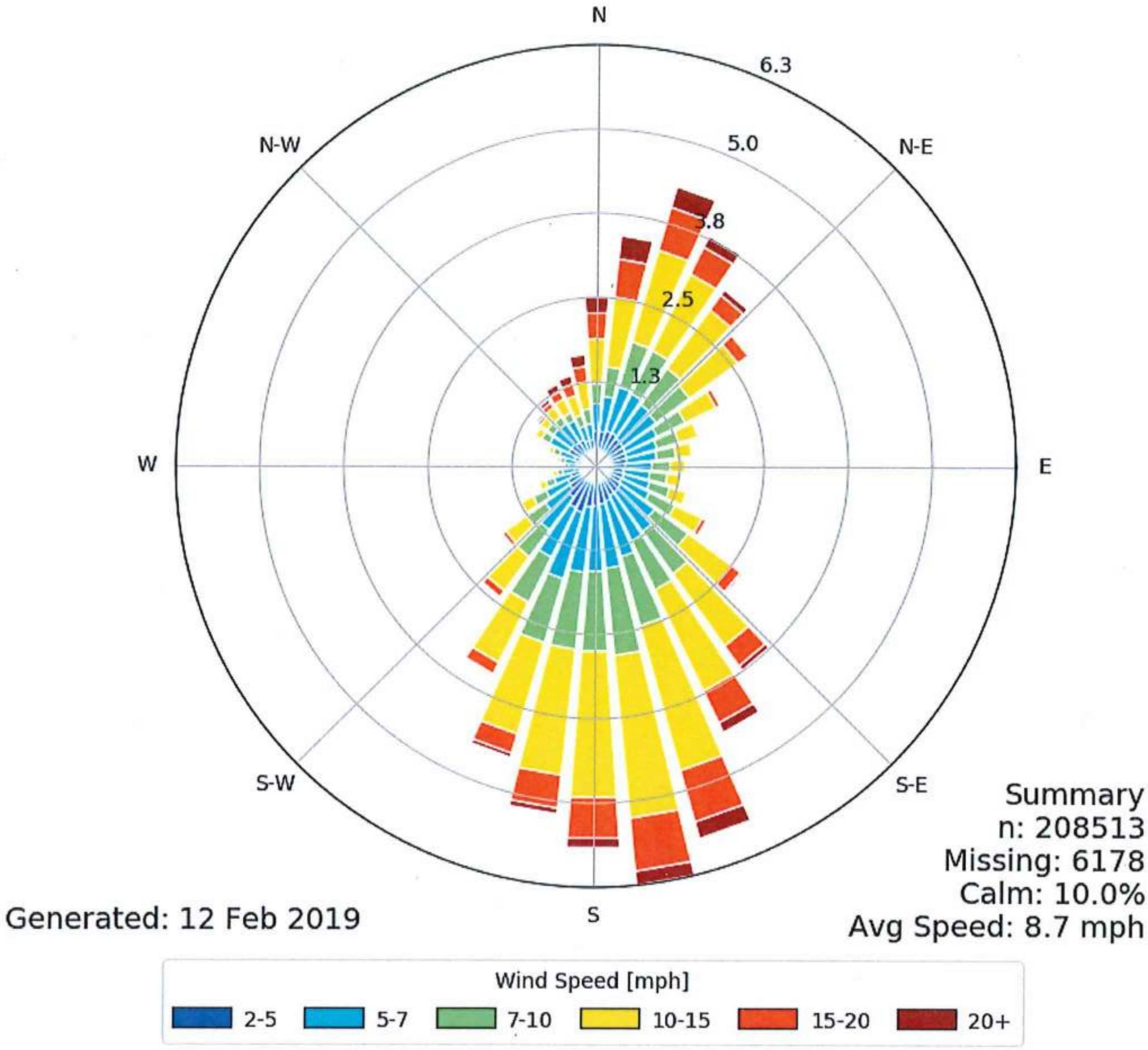
WIND ROSE

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337

[BAZ] NEW BRAUNFELS MUNI APT (WAS 3R5)
Windrose Plot [All Year]
Period of Record: 01 Nov 1998 - 12 Feb 2019



Summary
n: 208513
Missing: 6178
Calm: 10.0%
Avg Speed: 8.7 mph

Generated: 12 Feb 2019

ATTACHMENT R

OUTFALL USE DURING EXPANSION CONSTRUCTION

NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

July 2019

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6330 West Loop South, Suite 150 • Bellaire, TX 77401 • 713.777.5337

OUTFALL USE DURING EXPANSION CONSTRUCTION
NEW BRAUNFELS UTILITIES
SOUTH KUEHLER WASTEWATER TREATMENT PLANT

Upon completion of the next proposed expansion phase, the existing North Kuehler WWTP and existing South Kuehler WWTP will no longer discharge from their existing, permitted outfalls. Both outfalls will be abandoned. Additionally, all flow that currently flows to the existing North Kuehler WWTP will now go to the South Kuehler WWTP, and it will operate as a single WWTP under a single TPDES permit. A new outfall will be constructed slightly upstream of the existing South Kuehler outfall that will be used for all future phases.

As part of the expansion construction, flow will be diverted from the existing outfalls to the new outfall. To accommodate this transition, there will be periods during construction where it will be necessary to utilize different combinations of the three outfall. There will be periods where flow is discharged from all three outfalls, the new outfall and the existing North Kuehler outfall, and the new outfall and the South Kuehler outfall. During these periods, the combined actual flow from the three outfalls will not be greater than the total flow permitted from the new outfall for the expansion. Continuous flow measurement will be provided at each outfall while it is in service. Additionally, individual sampling will occur at each of the outfalls, meaning if three outfalls are active, there will be three samples taken. The type of sample, frequency of samples, and the parameters tested for the sample taken at each outfall will be consistent with the requirements from the most recent phase of the permit (i.e. the North Kuehler WWTP outfall will follow the requirements of the 3.1 MGD phase of its existing permit, the South Kuehler WWTP outfall will follow the requirements of the 4.2 MGD phase of its existing permit, and the new outfall will follow the requirements of the 9.3 MGD phase in the permit). No composite or comingled samples will be taken between the different outfalls.

Flow discharged from the new outfall will receive different tertiary treatment than that discharged from the existing North Kuehler WWTP and South Kuehler WWTP outfalls. Flow discharged through both the existing North Kuehler WWTP and South Kuehler WWTP outfalls are disinfected with chlorine gas and dechlorinated with sulfur dioxide gas prior to discharge. Flow discharged through the new outfall will go through travelling bridge dual media filters and then disinfection channels utilizing ultraviolet light. The methods of tertiary treatment at each of the different outfalls will provide adequate treatment for the flow being discharged from the respective outfalls based on the required parameters in their TPDES permits. Ultimately all flow will go through the new outfall and will travel through travelling bridge dual media filters and then disinfection channels utilizing ultraviolet light.

Construction of the expansion will begin by constructing the new treatment facilities. During this time flow will continue to be discharged from the existing North Kuehler WWTP and South Kuehler WWTP outfalls in accordance with their existing permit requirements. The treatment facilities include a new flow splitting structure that receives all flow currently going to both the North Kuehler WWTP and South Kuehler WWTP. Once the new treatment facilities are complete, a portion of the influent flow will be directed to the new treatment facilities. All three outfalls will be utilized during the commissioning period. The North Kuehler WWTP outfall will then be taken out of service while work is being completed at the North Kuehler WWTP. During this period, flow will be discharged from the new outfall and the existing South Kuehler WWTP outfall. Flow being discharged from the new outfall will be filtered and disinfected with ultraviolet light. Flow being discharged from the existing South Kuehler WWTP outfall will be disinfected with gas chemical as it is currently. Once the work at the North Kuehler WWTP is complete, all flow going to North Kuehler will then permanently be discharged through the new outfall.

Then the existing South Kuehler WWTP outfall will be taken out of service while work in being completed at the South Kuehler WWTP. During this period flow will be discharged from the new outfall only. Flow being discharged from the new outfall will be filtered and disinfected with ultraviolet light. Once the work at the South Kuehler WWTP is complete, all flow going to South Kuehler will then permanently be discharged through the new outfall. At this point both of the existing outfalls will be abandoned and no longer utilized.

The exact sequencing and durations of each phase of construction will be determined by the construction contractor. Instead of the order described above, the contractor may elect to perform the work at the South Kuehler WWTP prior to the North Kuehler WWTP. Should this be the case, the process described above will remain the same, except the order will be switched. This would mean the South Kuehler outfall will be taken out of service first, followed by the North Kuehler WWTP outfall. In this case there will be a period where all three outfall are utilized as described above, followed by a period where the new outfall and existing North Kuehler WWTP outfall being utilized at the same time. During this period flow being discharged from the new outfall will be filtered and disinfected with ultraviolet light and flow being discharged from the existing North Kuehler WWTP outfall will be disinfected with gas chemical as it is currently. Then the North Kuehler WWTP outfall would be taken out of service and all flow would discharge through the new outfall.

In either sequencing scenario, only one of the two existing WWTP outfalls will be taken out of service at a time.