Administrative Package Cover Page

This file contains the following documents:

1. Summary of application (in plain language)
   - English
   - Alternative Language (Spanish)
2. First Notice (NORI-Notice of Receipt of Application and Intent to Obtain a Permit)
   - English
   - Alternative Language (Spanish)
3. Application materials

Portada de Paquete Administrativo

Este archivo contiene los siguientes documentos:

1. Resumen en lenguaje sencillo (PLS, por sus siglas en inglés) de la actividad propuesta
   - Inglés
   - Idioma alternativo (español)
2. Primer aviso (NORI, por sus siglas en inglés)
   - Inglés
   - Idioma alternativo (español)
3. Solicitud original

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS INDUSTRAIL WASTEWATER/STORMWATER

The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

Wolf Hollow Services, LLC (CN604896670) operates the Wolf Hollow I Generating Station (RN100219195), a gas fired electric generating facility, with a total generating capacity of 807 megawatts. The facility is located at 9201 Wolf Hollow Court, Granbury, Hood County, Texas 76048.

This application is for renewal of TPDES Permit No. WQ0004288000 to discharge a maximum average of 1,243,000 gallons per day of cooling tower blowdown, boiler blowdown, and low volume wastes. Cooling water is withdrawn from Lake Granbury on the Brazos River. Outfall 001 discharges downstream of the lake into the Brazos River. Treatment processes include oil/water separation.

The discharge from Outfall 001 is subject to federal effluent limitation guidelines at 40 CFR Part 423. The pollutants expected from these discharges based on the guidelines are free available and total residual chlorine, total suspended solids, oil and grease, pH, and temperature. Other potential pollutants that may be in the discharge are included in Worksheet 2 of the TPDES application.

PLANTILLA EN ESPAÑOL PARA SOLICITUDES NUEVAS/RENOVACIONES/ENMIENDAS DE TPDES o TLAP

AGUAS RESIDUALES INDUSTRIALES /AGUAS PLUVIALES

El siguiente resumen se proporciona para esta solicitud de permiso de calidad del agua pendiente que está siendo revisada por la Comisión de Calidad Ambiental de Texas según lo requerido por el Capítulo 39 del Código Administrativo de Texas 30. La información proporcionada en este resumen puede cambiar durante la revisión técnica de la solicitud y no es una representación ejecutiva fedérale de la solicitud de permiso.

Wolf Hollow Services, LLC (CN604896670) opera la estación generadora Wolf Hollow I (RN100219195), una instalación generadora de electricidad a gas, con una capacidad total de generación de 807 megavatios. La instalación está ubicada en 9201 Wolf Hollow Court, Granbury, Condado de Hood, Texas 76048.

Esta solicitud es para la renovación del permiso TPDES no. WQ0004288000 para descargar un promedio máximo de 1,243,000 galones por día de purga de la torre de refrigeración, purga de la caldera y desechos de bajo volumen. El agua de refrigeración se extrae del Lago Granbury en el río Brazos. El Outfall 001 descarga aguas abajo del lago en el río Brazos. Los procesos de tratamiento incluyen la separación de aceite/agua.

La descarga del Outfall 001 está sujeta a las directrices federales de limitación de efluentes del 40 CFR Parte 423. Los contaminantes que se esperan de estas descargas según las directrices son cloro libre disponible y residual total, sólidos suspendidos totales, aceite y grasa, pH y temperatura. Otros contaminantes potenciales que pueden estar en la descarga se incluyen en la Worksheet 2 de la solicitud TPDES.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

NOTICE OF RECEIPT OF APPLICATION AND INTENT TO OBTAIN WATER QUALITY PERMIT RENEWAL

PERMIT NO. WQ0004288000

APPLICATION. Wolf Hollow I Power, LLC, 9201 Wolf Hollow Court, Granbury, Texas 76048, which owns a natural gas-fired combined-cycle electric power generating facility, has applied to the Texas Commission on Environmental Quality (TCEQ) to renew Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0004288000 (EPA I.D. No. TX0123820) to authorize the discharge of treated wastewater at a volume not to exceed a daily average flow of 1,243,000 gallons per day. The facility is located at 9201 Wolf Hollow Court, near the city of Granbury, in Hood County, Texas 76048. The discharge route is from the plant site directly to the Brazos River Below Lake Granbury. TCEQ received this application on April 15, 2025. The permit application will be available for viewing and copying at Hood County Library, 222 North Travis Street, Granbury, in Hood County, Texas prior to the date this notice is published in the newspaper. The application, including any updates, and associated notices are available electronically at the following webpage: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-97.731944,32.333056&level=18

ALTERNATIVE LANGUAGE NOTICE. Alternative language notice in Spanish is available at: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. El aviso de idioma alternativo en español está disponible en https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.

ADDITIONAL NOTICE. TCEQ's Executive Director has determined the application is administratively complete and will conduct a technical review of the application. After technical review of the application is complete, the Executive Director may prepare a draft permit and will issue a preliminary decision on the application. **Notice of the Application and Preliminary Decision will be published and mailed to those who are on the county-wide mailing list and to those who are on the mailing list for this application. That notice will contain the deadline for submitting public comments.**

PUBLIC COMMENT / PUBLIC MEETING. You may submit public comments or request a public meeting on this application. The purpose of a public meeting is to provide the opportunity to submit comments or to ask questions about the application. TCEQ will hold a public meeting if the Executive Director determines that there is a significant degree of public

interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing.

OPPORTUNITY FOR A CONTESTED CASE HEARING. After the deadline for submitting public comments, the Executive Director will consider all timely comments and prepare a response to all relevant and material, or significant public comments. **Unless the application is directly referred for a contested case hearing, the response to comments, and the Executive Director's decision on the application, will be mailed to everyone who submitted public comments and to those persons who are on the mailing list for this application. If comments are received, the mailing will also provide instructions for requesting reconsideration of the Executive Director's decision and for requesting a contested case hearing.** A contested case hearing is a legal proceeding similar to a civil trial in state district court.

TO REQUEST A CONTESTED CASE HEARING, YOU MUST INCLUDE THE FOLLOWING ITEMS IN YOUR REQUEST: your name, address, phone number; applicant's name and proposed permit number; the location and distance of your property/activities relative to the proposed facility; a specific description of how you would be adversely affected by the facility in a way not common to the general public; a list of all disputed issues of fact that you submit during the comment period and, the statement "[I/we] request a contested case hearing." If the request for contested case hearing is filed on behalf of a group or association, the request must designate the group's representative for receiving future correspondence; identify by name and physical address an individual member of the group who would be adversely affected by the proposed facility or activity; provide the information discussed above regarding the affected member's location and distance from the facility or activity; explain how and why the member would be affected; and explain how the interests the group seeks to protect are relevant to the group's purpose.

Following the close of all applicable comment and request periods, the Executive Director will forward the application and any requests for reconsideration or for a contested case hearing to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

The Commission may only grant a request for a contested case hearing on issues the requestor submitted in their timely comments that were not subsequently withdrawn. **If a hearing is granted, the subject of a hearing will be limited to disputed issues of fact or mixed questions of fact and law relating to relevant and material water quality concerns submitted during the comment period. TCEQ may act on an application to renew a permit for discharge of wastewater without providing an opportunity for a contested case hearing if certain criteria are met.**

MAILING LIST. If you submit public comments, a request for a contested case hearing or a reconsideration of the Executive Director's decision, you will be added to the mailing list for this specific application to receive future public notices mailed by the Office of the Chief Clerk. In addition, you may request to be placed on: (1) the permanent mailing list for a specific applicant name and permit number; and/or (2) the mailing list for a specific county. If you wish to be placed on the permanent and/or the county mailing list, clearly specify which list(s) and send your request to TCEQ Office of the Chief Clerk at the address below.

INFORMATION AVAILABLE ONLINE. For details about the status of the application, visit the Commissioners' Integrated Database at www.tceq.texas.gov/goto/cid. Search the database using the permit number for this application, which is provided at the top of this notice.

AGENCY CONTACTS AND INFORMATION. All public comments and requests must be submitted either electronically at **https://www14.tceq.texas.gov/epic/eComment/**, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Please be aware that any contact information you provide, including your name, phone number, email address and physical address will become part of the agency's public record. For more information about this permit application or the permitting process, please call the TCEQ Public Education Program, Toll Free, at 1-800-687-4040 or visit their website at www.tceq.texas.gov/goto/pep. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from Wolf Hollow I Power, LLC at the address stated above or by calling Mr. Jordan Bryan, HSE Manager, at 817-579-4720.

Issuance Date: June 3, 2025

Comisión de Calidad Ambiental del Estado de Texas

AVISO DE RECIBO DE LA SOLICITUD Y
EL INTENTO DE OBTENER PERMISO PARA LA CALIDAD DEL AGUA
RENOVACION

PERMISO NO. WQ0004288000

SOLICITUD. Wolf Hollow I Power, LLC, 9201 Wolf Hollow Court, Granbury, Texas 76048, que posee una planta de generación de energía eléctrica de ciclo combinado a gas natural, ha solicitado a la Comisión de Calidad Ambiental del Estado de Texas (TCEQ) para renovar el Permiso No. WQ0004288000 (EPA I.D. No. TX0123820) del Sistema de Eliminación de Descargas de Contaminantes de Texas (TPDES) para autorizar la descarga de aguas residuales tratadas en un volumen que no sobrepasa un flujo promedio diario de 1,243,000 galones por día. La planta está ubicada 9201 Wolf Hollow Court, cerca de la ciudad de Granbury, en el Condado de Hood, Texas 76048. La ruta de descarga es del sitio de la planta directamente al Río Brazos, debajo del Lago Granbury. La TCEQ recibió esta solicitud el 15 de abril de 2025. La solicitud para el permiso estará disponible para leerla y copiarla en Hood County Library, 222 North Travis Street, Granbury, en el Condado de Hood, Texas antes de la fecha de publicación de este aviso en el periódico. La solicitud (cualquier actualización y aviso inclusive) está disponible electrónicamente en la siguiente página web: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. Este enlace a un mapa electrónico de la ubicación general del sitio o de la instalación es proporcionado como una cortesía y no es parte de la solicitud o del aviso. Para la ubicación exacta, consulte la solicitud. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-97.731944,32.333056&level=18

AVISO DE IDIOMA ALTERNATIVO. El aviso de idioma alternativo en español está disponible en https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.

AVISO ADICIONAL. El Director Ejecutivo de la TCEQ ha determinado que la solicitud es administrativamente completa y conducirá una revisión técnica de la solicitud. Después de completar la revisión técnica, el Director Ejecutivo puede preparar un borrador del permiso y emitirá una Decisión Preliminar sobre la solicitud. **El aviso de la solicitud y la decisión preliminar serán publicados y enviado a los que están en la lista de correo de las personas a lo largo del condado que desean recibir los avisos y los que están en la lista de correo que desean recibir avisos de esta solicitud. El aviso dará la fecha límite para someter comentarios públicos.**

COMENTARIO PUBLICO / REUNION PUBLICA. Usted puede presentar comentarios públicos o pedir una reunión pública sobre esta solicitud. El propósito de una reunión pública es dar la oportunidad de presentar comentarios o hacer preguntas acerca de la solicitud. La TCEQ

realiza una reunión pública si el Director Ejecutivo determina que hay un grado de interés público suficiente en la solicitud o si un legislador local lo pide. Una reunión pública no es una audiencia administrativa de lo contencioso.

OPORTUNIDAD DE UNA AUDIENCIA ADMINISTRATIVA DE LO CONTENCIOSO. Después del plazo para presentar comentarios públicos, el Director Ejecutivo considerará todos los comentarios apropiados y preparará una respuesta a todo los comentarios públicos esenciales, pertinentes, o significativos. **A menos que la solicitud haya sido referida directamente a una audiencia administrativa de lo contencioso, la respuesta a los comentarios y la decisión del Director Ejecutivo sobre la solicitud serán enviados por correo a todos los que presentaron un comentario público y a las personas que están en la lista para recibir avisos sobre esta solicitud. Si se reciben comentarios, el aviso también proveerá instrucciones para pedir una reconsideración de la decisión del Director Ejecutivo y para pedir una audiencia administrativa de lo contencioso.** Una audiencia administrativa de lo contencioso es un procedimiento legal similar a un procedimiento legal civil en un tribunal de distrito del estado.

PARA SOLICITAR UNA AUDIENCIA DE CASO IMPUGNADO, USTED DEBE INCLUIR EN SU SOLICITUD LOS SIGUIENTES DATOS: su nombre, dirección, y número de teléfono; el nombre del solicitante y número del permiso; la ubicación y distancia de su propiedad/actividad con respecto a la instalación; una descripción específica de la forma cómo usted sería afectado adversamente por el sitio de una manera no común al público en general; una lista de todas las cuestiones de hecho en disputa que usted presente durante el período de comentarios; y la declaración "[Yo/nosotros] solicito/solicitamos una audiencia de caso impugnado". Si presenta la petición para una audiencia de caso impugnado de parte de un grupo o asociación, debe identificar una persona que representa al grupo para recibir correspondencia en el futuro; identificar el nombre y la dirección de un miembro del grupo que sería afectado adversamente por la planta o la actividad propuesta; proveer la información indicada anteriormente con respecto a la ubicación del miembro afectado y su distancia de la planta o actividad propuesta; explicar cómo y porqué el miembro sería afectado; y explicar cómo los intereses que el grupo desea proteger son pertinentes al propósito del grupo.

Después del cierre de todos los períodos de comentarios y de petición que aplican, el Director Ejecutivo enviará la solicitud y cualquier petición para reconsideración o para una audiencia de caso impugnado a los Comisionados de la TCEQ para su consideración durante una reunión programada de la Comisión.

La Comisión sólo puede conceder una solicitud de una audiencia de caso impugnado sobre los temas que el solicitante haya presentado en sus comentarios oportunos que no fueron retirados posteriormente. **Si se concede una audiencia, el tema de la audiencia estará limitado a cuestiones de hecho en disputa o cuestiones mixtas de hecho y de derecho relacionadas a intereses pertinentes y materiales de calidad del agua que se hayan presentado durante el período de comentarios. Si ciertos criterios se cumplen, la TCEQ puede actuar sobre una solicitud para renovar un permiso sin proveer una oportunidad de una audiencia administrativa de lo contencioso.**

LISTA DE CORREO. Si somete comentarios públicos, un pedido para una audiencia administrativa de lo contencioso o una reconsideración de la decisión del Director Ejecutivo,

la Oficina del Secretario Principal enviará por correo los avisos públicos en relación con la solicitud. Además, puede pedir que la TCEQ ponga su nombre en una o más de las listas correos siguientes (1) la lista de correo permanente para recibir los avisos del solicitante indicado por nombre y número del permiso específico y/o (2) la lista de correo de todas las solicitudes en un condado especifico. Si desea que se agrega su nombre en una de las listas designe cual lista(s) y envía por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

INFORMACIÓN DISPONIBLE EN LÍNEA. Para detalles sobre el estado de la solicitud, favor de visitar la Base de Datos Integrada de los Comisionados en www.tceq.texas.gov/goto/cid. Para buscar en la base de datos, utilizar el número de permiso para esta solicitud que aparece en la parte superior de este aviso.

CONTACTOS E INFORMACIÓN A LA AGENCIA. Todos los comentarios públicos y solicitudes deben ser presentadas electrónicamente vía http://www14.tceq.texas.gov/epic/eComment/ o por escrito dirigidos a la Comisión de Texas de Calidad Ambiental, Oficial de la Secretaría (Office of Chief Clerk), MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Tenga en cuenta que cualquier información personal que usted proporcione, incluyendo su nombre, número de teléfono, dirección de correo electrónico y dirección física pasarán a formar parte del registro público de la Agencia. Para obtener más información acerca de esta solicitud de permiso o el proceso de permisos, llame al programa de educación pública de la TCEQ, gratis, al 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040.

También se puede obtener información adicional del Wolf Hollow I Power, LLC a la dirección indicada arriba o llamando a Sr. Jordan Bryan al 817-579-4720.

Fecha de emisión: el 3 de junio de 2025

Leah Whallon

From: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>
Sent: Tuesday, May 27, 2025 1:17 PM
To: Leah Whallon
Subject: RE: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I; Notice of Deficiency 30-Day Will Return Letter
Attachments: RECEIPT.pdf

Leah,

I checked with the cashier's office and they said it process on the 25th and provided the attached receipt.

Thanks,

Jordan Bryan
HSE Manager
(O) Wolf Hollow I – 817.579.4720
jordan.bryan@ethosenergy.com

From: Leah Whallon <Leah.Whallon@Tceq.Texas.Gov>
Sent: Friday, May 23, 2025 11:39 AM
To: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>
Subject: RE: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I; Notice of Deficiency 30-Day Will Return Letter

Thank you, Jordan.

I checked with our cashier's office and they have not received the check yet, but it should be okay. I will follow up next week. Please let me know if you have any questions.

Have a great weekend!

Leah Whallon
Texas Commission on Environmental Quality
Water Quality Division
512-239-0084
leah.whallon@tceq.texas.gov

How is our customer service? Fill out our online customer satisfaction survey at www.tceq.texas.gov/customersurvey

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From: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>
Sent: Thursday, May 22, 2025 9:55 AM
To: Leah Whallon <Leah.Whallon@Tceq.Texas.Gov>
Subject: RE: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I; Notice of Deficiency 30-Day Will Return Letter

Hi Leah,

I received confirmation that it was sent Tuesday. I'm looking at the attached documentation that was provided, however, and I'm wondering if TCEQ will be able to accept it? I'm not sure if it's from our accounting team's software or what, but the check is written to TCEQ but also has the name of a member of our accounting team and the corporate address for the facility owner. Please let me know if that needs to be corrected and I will reach out to them immediately.

It also appears the send-to address on the attached document is our corporate address but I can confirm it was mailed to the Revenue Section at MC 214.

Regards,

Jordan Bryan
HSE Manager
(O) Wolf Hollow I – 817.579.4720
jordan.bryan@ethosenergy.com

From: Leah Whallon <Leah.Whallon@Tceq.Texas.Gov>
Sent: Thursday, May 22, 2025 9:40 AM
To: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>

Subject: RE: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I; Notice of Deficiency 30-Day Will Return Letter

Hi Jordan,

I'm following up to see if the transfer application payment was sent? Are you able to provide the check or voucher number? This is the only item needed to complete everything.

Thank you,

Leah Whallon
Texas Commission on Environmental Quality
Water Quality Division
512-239-0084
leah.whallon@tceq.texas.gov

How is our customer service? Fill out our online customer satisfaction survey at www.tceq.texas.gov/customersurvey

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From: Leah Whallon
Sent: Wednesday, May 14, 2025 11:42 AM
To: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>
Subject: RE: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I; Notice of Deficiency 30-Day Will Return Letter

Thank you, Jordan.

I also received the hard copy of the transfer application. I will work on completing the transfer order and notice documents for the renewal by the end of this week. Please let me know if you have any questions.

Thanks,

Leah Whallon
Texas Commission on Environmental Quality
Water Quality Division
512-239-0084
leah.whallon@tceq.texas.gov

How is our customer service? Fill out our online customer satisfaction survey at www.tceq.texas.gov/customersurvey

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From: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>
Sent: Wednesday, May 14, 2025 8:24 AM
To: Leah Whallon <Leah.Whallon@Tceq.Texas.Gov>

Subject: RE: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I; Notice of Deficiency 30-Day Will Return Letter

Ms. Whallon,

Attached please find updated Industrial Wastewater Permit Application Administrative Report, as well as Core Data Form as requested in Item 4 of the Administrative Report. The Application to Transfer a Wastewater Permit (original and copy along with Core Data Form) show to have been delivered 5/12 at TCEQ's Austin office (MC 148). Transfer application fee is processing and pending confirmation of mailing.

Please advise if any further information is required.

Regards,

Jordan Bryan
HSE Manager
(O) Wolf Hollow I – 817.579.4720
jordan.bryan@ethosenergy.com

From: Leah Whallon <Leah.Whallon@Tceq.Texas.Gov>
Sent: Monday, May 12, 2025 1:59 PM
To: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>
Subject: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I; Notice of Deficiency 30-Day Will Return Letter

Good Afternoon,

Please see the attached Notice of Deficiency 30-Day Will Return Letter dated May 12, 2025 requesting the response needed to declare the application administratively complete. The original will be sent by certified mail. Please send the complete response by June 11, 2025.

Thank you,

Leah Whallon
Texas Commission on Environmental Quality
Water Quality Division
512-239-0084
leah.whallon@tceq.texas.gov

How is our customer service? Fill out our online customer satisfaction survey at www.tceq.texas.gov/customersurvey

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INDUSTRIAL WASTEWATER PERMIT APPLICATION CHECKLIST

Complete and submit this checklist with the industrial wastewater permit application.

APPLICANT NAME: Wolf Hollow Power I, LLC

PERMIT NUMBER (If new, leave blank): WQ00 04288000

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

	Y	N		Y	N
Administrative Report 1.0	☒	☐	Worksheet 8.0	☐	☒
Administrative Report 1.1	☐	☒	Worksheet 9.0	☐	☒
SPIF	☒	☐	Worksheet 10.0	☐	☒
Core Data Form	☐	☒	Worksheet 11.0	☒	☐
Summary of Application (PLS)	☒	☐	Worksheet 11.1	☒	☐
Public Involvement Plan Form	☐	☒	Worksheet 11.2	☒	☐
Technical Report 1.0	☒	☐	Worksheet 11.3	☒	☐
Worksheet 1.0	☒	☐	Original USGS Map	☒	☐
Worksheet 2.0	☒	☐	Affected Landowners Map	☐	☒
Worksheet 3.0	☐	☒	Landowner Disk or Labels	☐	☒
Worksheet 3.1	☐	☒	Flow Diagram	☒	☐
Worksheet 3.2	☐	☒	Site Drawing	☒	☐
Worksheet 3.3	☐	☒	Original Photographs	☐	☒
Worksheet 4.0	☒	☐	Design Calculations	☐	☒
Worksheet 4.1	☐	☒	Solids Management Plan	☐	☒
Worksheet 5.0	☐	☒	Water Balance	☒	☐
Worksheet 6.0	☐	☒			
Worksheet 7.0	☐	☒			

For TCEQ Use Only

Segment Number _____County _____
Expiration Date _____Region _____
Permit Number _____

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INDUSTRIAL WASTEWATER PERMIT APPLICATION ADMINISTRATIVE REPORT 1.0

This report is required for all applications for TPDES permits and TLAPs, except applications for oil and gas extraction operations subject to 40 CFR Part 435. Contact the Applications Review and Processing Team at 512-239-4671 with any questions about completing this report.

Applications for oil and gas extraction operations subject to 40 CFR Part 435 must use Oil and Gas Exploration and Production Administrative Report (TCEQ Form-20893 and 20893-inst[1]).

Item 1. Application Information and Fees (Instructions, Page 26)

a. Complete each field with the requested information, if applicable.
Applicant Name: Wolf Hollow I Power, LLC
Permit No.: WQ0004288000
EPA ID No.: TX0123820
Expiration Date: October 13, 2025

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

☒ Industrial Wastewater (wastewater and stormwater)
☐ Industrial Stormwater (stormwater only)
☐ Reverse Osmosis Water Treatment (reverse osmosis water treatment wastewaters only)

c. Check the box next to the appropriate facility status.

☒ Active ☐ Inactive

d. Check the box next to the appropriate permit type.

☒ TPDES Permit ☐ TLAP ☐ TPDES with TLAP component

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

☐ New
☒ Renewal with changes
☐ Renewal without changes
☐ Major amendment with renewal
☐ Major amendment without renewal
☐ Minor amendment without renewal
☐ Minor modification without renewal

f. If applying for an amendment or modification, describe the request: Remove items related to Interim Phase because the facility is operating in Final Phase.

For TCEQ Use Only

Segment Number _____County _____
Expiration Date _____Region _____
Permit Number _____

[1] https://www.tceq.texas.gov/publications/search_forms.html

g. Application Fee

EPA Classification	New	Major Amend. (with or without renewal)	Renewal (with or without changes)	Minor Amend. / Minor Mod. (without renewal)
Minor facility not subject to EPA categorical effluent guidelines (40 CFR Parts 400-471)	☐ $350	☐ $350	☐ $315	☐ $150
Minor facility subject to EPA categorical effluent guidelines (40 CFR Parts 400-471)	☐ $1,250	☐ $1,250	☐ $1,215	☐ $150
Major facility	N/A [2]	☐ $2,050	☒ $2,015	☐ $450

h. Payment Information

Mailed

Check or money order No.: N/A

Check or money order amt.: N/A

Named printed on check or money order: N/A

Epay

Voucher number: Payment made via online application submittal.

Copy of voucher attachment: N/A

Item 2. Applicant Information (Instructions, Pages 26)

a. Customer Number, if applicant is an existing customer: CN600130132

Note: Locate the customer number using the TCEQ's Central Registry Customer Search[3].

b. Legal name of the entity (applicant) applying for this permit: Wolf Hollow I Power, LLC

Note: The owner of the facility must apply for the permit. The legal name must be spelled exactly as filed with the TX SOS, Texas Comptroller of Public Accounts, County, or in the legal documents forming the entity.

c. Name and title of the person signing the application. (**Note:** The person must be an executive official that meets signatory requirements in 30 TAC § 305.44.)

Prefix: Mr. Full Name (Last/First Name): Rex LaMew

Title: Facility Manager Credential: N/A

d. Will the applicant have overall financial responsibility for the facility?

☒ Yes ☐ No

[2] All facilities are designated as minors until formally classified as a major by EPA.

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

Note: The entity with overall financial responsibility for the facility must apply as a co-applicant, if not the facility owner.

Item 3. Co-applicant Information (Instructions, Page 27)

☒ Check this box if there is no co-applicant.; otherwise, complete the below questions.

a. Legal name of the entity (co-applicant) applying for this permit: N/A

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

b. Customer Number (if applicant is an existing customer): CN N/A

Note: Locate the customer number using the TCEQ's Central Registry Customer Search.

c. Name and title of the person signing the application. (**Note:** The person must be an executive official that meets signatory requirements in 30 TAC § 305.44.)

Prefix: N/A Full Name (Last/First Name): N/A

Title: N/A Credential: N/A

d. Will the co-applicant have overall financial responsibility for the facility?

☐ Yes ☐ No

Note: The entity with overall financial responsibility for the facility must apply as a co-applicant, if not the facility owner.

Item 4. Core Data Form (Instructions, Pages 27)

a. Complete and attach one Core Data Form (TCEQ Form 10400) for each customer (applicant and co-applicant(s)). If the customer type selected on the Core Data Form is Individual, complete Attachment 1 of the Administrative Report. Attachment: N/A

Item 5. Application Contact Information (Instructions, Page 27)

Provide names of two individuals who can be contacted about this application. Indicate if the individual can be contacted about administrative or technical information, or both.

a. ☒ Administrative Contact . ☒ Technical Contact

Prefix: Mr. Full Name (Last/First Name): Jordan Bryan

Title: HSE Manager Credential: N/A

Organization Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court City/State/Zip: Granbury, TX 76048

Phone No: 917-579-4720 Email: jordan.bryan@ethosenergy.com

b. ☐ Administrative Contact ☐ Technical Contact

Prefix: N/A Full Name (Last/First Name): N/A

Title: N/A Credential: N/A

Organization Name: N/A

Mailing Address: N/A City/State/Zip: N/A

Phone No: N/A Email: N/A

Attachment: N/A

Item 6. Permit Contact Information (Instructions, Page 28)

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

a. Prefix: Mr. Full Name (Last/First Name): Rex LaMew

Title: Facility Manager Credential: N/A

Organization Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court City/State/Zip: Granbury, TX 76048

Phone No: 817-579-4778 Email: rex.lamew@ethosenergy.com

b. Prefix: Mr. Full Name (Last/First Name): Jordan Bryan

Title: HSE Manager Credential: N/A

Organization Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court City/State/Zip: Granbury, TX 76048

Phone No: 817-579-4720 Email: jordan.bryan@ethosenergy.com

Attachment: N/A

Item 7. Billing Contact Information (Instructions, Page 28)

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

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

Prefix: Mr. Full Name (Last/First Name): Dave Areno

Title: Business Manager Credential: N/A

Organization Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court City/State/Zip: Granbury, TX 76048

Phone No: 817-579-4708 Email: dave.areno@ethosenergy.com

Item 8. DMR/MER Contact Information (Instructions, Page 28)

Provide the name and mailing address of the person delegated to receive and submit DMRs or MERs. **Note:** DMR data must be submitted through the NetDMR system. An electronic reporting account can be established once the facility has obtained the permit number.

Prefix: Mr. Full Name (Last/First Name): Jordan Bryan

Title: HSE Manager Credential: N/A

Organization Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court City/State/Zip: Granbury, TX 76048

Phone No: 817-579-4720 Email: jordan.bryan@ethosenergy.com

Item 9. Notice Information (Instructions, Pages 28)

a. Individual Publishing the Notices

Prefix: Mr. Full Name (Last/First Name): Jordan Bryan

Title: HSE Manager Credential: N/A

Organization Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court City/State/Zip: Granbury, TX 76048

Phone No: 817-579-4720 Email: jordan.bryan@ethosenergy.com

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

☒ E-mail: jordan.bryan@ethosenergy.com

☐ Fax: N/A

☐ Regular Mail (USPS)

Mailing Address: N/A

City/State/Zip Code: N/A

c. Contact in the Notice

Prefix: Mr. Full Name (Last/First Name): Jordan Bryan

Title: HSE Manager Credential: N/A

Organization Name: Wolf Hollow I Power, LLC

Phone No: 817-579-4720 Email: jordan.bryan@ethosenergy.com

d. Public Viewing Location Information

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

Public building name: Hood County Library Location within the building: N/A

Physical Address of Building: 222 North Travis Street

City: Granbury County: Hood

e. Bilingual Notice Requirements

This information is required for new, major amendment, minor amendment or minor modification, and renewal 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.

Call the bilingual/ESL coordinator at the nearest elementary and middle schools and obtain the following information to determine if an alternative language notice(s) is 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 Item 8 (Regulated Entity and Permitted Site Information.)

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

   ☒ Yes ☐ No

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

   ☐ Yes ☒ No

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

   ☐ Yes ☐ No ☒ N/A

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

f. Summary of Application in Plain Language Template – Complete and attach the Summary of Application in Plain Language Template (TCEQ Form 20972), also known as the plain language summary or PLS. Attachment: PLS-1 Plain Language Summary

g. Complete and attach one Public Involvement Plan (PIP) Form (TCEQ Form 20960) for each application for a new permit or major amendment. Attachment: N/A (renewal, not new permit or major amendment

Item 10. Regulated Entity and Permitted Site Information (Instructions Page 29)

a. TCEQ issued Regulated Entity Number (RN), if available: RN100219195

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

b. Name of project or site (name known by the community where located): Wolf Hollow I

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

☒ Yes ☐ No ☐ N/A (new permit)

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

d. Owner of treatment facility:

Prefix: N/A Full Name (Last/First Name): N/A

or Organization Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court City/State/Zip: Granbury, TX 76048

Phone No: 817-579-4778 Email: rex.lamew@ethosenergy.com

e. Ownership of facility: ☐ Public ☒ Private ☐ Both ☐ Federal

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

Prefix: N/A Full Name (Last/First Name): N/A

or Organization Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court City/State/Zip: Granbury, TX 76048

Phone No: 817-579-4778 Email: rex.lamew@ethosenergy.com

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

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

Prefix: N/A Full Name (Last/First Name): N/A

or Organization Name: N/A

Mailing Address: N/A City/State/Zip: N/A

Phone No: N/A Email: N/A

Note: If not the same as the facility owner, attach a long-term lease agreement in effect for at least six years. Attachment: N/A

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

Prefix: N/A Full Name (Last/First Name): N/A

or Organization Name: N/A

Mailing Address: N/A City/State/Zip: N/A

Phone No: N/A Email: N/A

Note: If not the same as the facility owner, attach a long-term lease agreement in effect for at least six years. Attachment: N/A

Item 11. TDPES Discharge/TLAP Disposal Information (Instructions, Page 31)

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

☐ Yes ☒ No

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

☒ One-mile radius
☐ Three-miles downstream information
☒ Applicant's property boundaries
☒ Treatment facility boundaries
☒ Labeled point(s) of discharge
☒ Highlighted discharge route(s)
☐ Effluent disposal site boundaries
☐ All wastewater ponds
☐ Sewage sludge disposal site
☐ New and future construction

Attachment: A-1 USGS Maps

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

☐ Yes ☐ No or New Permit

If no, or a new application, provide an accurate location description: N/A

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

☒ Yes ☐ No or New Permit

If no, or a new application, provide an accurate location description: N/A

e. Are the discharge route(s) in the existing permit correct?

☒ Yes ☐ No or New Permit

If no, or a new permit, provide an accurate description of the discharge route: N/A

f. City nearest the outfall(s): Granbury

g. County in which the outfalls(s) is/are located: Hood

h. 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, attach copies of letters that show proof of contact and provide the approval letter upon receipt. Attachment: N/A

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: N/A

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

☐ Yes No or New Permit ☐ N/A

If no, or a new application, provide an accurate location description: N/A

j. City nearest the disposal site: N/A

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

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

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

Item 12. Miscellaneous Information (Instructions, Page 33)

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

☐ Yes ☒ No

If yes, list each person: N/A

b. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

If yes, provide the following information:

Account no.: N/A

Total amount due: N/A

c. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

If yes, provide the following information:

Enforcement order no.: N/A

Amount due: N/A

Item 13. Signature Page (Instructions, Page 33)

Permit No: WQ0004288000

Applicant Name: Wolf Hollow Power I, LLC

Certification: I, Rex LaMew, 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): Rex LaMew

Signatory title: Facility Manager

Signature: Rex LaMew Rex LaMew Date: 5-13-2025

(Use blue ink)

Subscribed and Sworn to before me by the said Rex LaMew

on this 13 day of May, 2025.

My commission expires on the 24 day of May, 2027.

Elizabeth Lewis
Notary Public

[SEAL]

ELIZABETH LEWIS
Notary Public, State of Texas
Comm. Expires 05-24-2027
Notary ID 134375656

Hood
County, Texas

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

INDUSTRIAL WASTEWATER PERMIT APPLICATION

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

This form applies to TPDES permit applications only. Complete and attach the Supplemental Permit information Form (SPIF) (TCEQ Form 20971).

Attachment: SPIF-1 Supplemental Permit Information Form

Leah Whallon

From: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>
Sent: Wednesday, May 7, 2025 9:39 AM
To: Leah Whallon
Cc: Dianna Kocurek
Subject: RE: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I
Attachments: Industrial Discharge Renewal Spanish NORI.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Ms. Whallon,

In response to the Notice of Deficiency letter dated April 24, 2025, Wolf Hollow I Power provides the following:

- Regarding item 1, we have identified the following errors/omissions:
  - As we have discussed, the two references to Wolf Hollow Services, LLC need to be changed to Wolf Hollow I Power, LLC, as the former does not own the facility and is not applying for the permit renewal. *TCEQ Application to Transfer a Wastewater Permit or CAFO Permit* has been completed with the exception of one notarized signature from Wolf Hollow Services, LLC. We anticipate being able to provide the completed document with signed affidavits and corresponding Core Data Form this week.
  - "Below" in '*directly to the Brazos River Below Lake Granbury*' should not be capitalized.

  No other errors/omissions have been identified in the provided NORI verbiage.

- Regarding item 2, the translated Spanish NORI is attached. Portions provided by Wolf Hollow I Power were left in red text for reference. Please note, references to Wolf Hollow Services, LLC, have been left in place in the Spanish text for consistency.

Please advise if any further information is required.

Regards,

Jordan Bryan
HSE Manager
(O) Wolf Hollow I – 817.579.4720
jordan.bryan@ethosenergy.com

From: Leah Whallon <Leah.Whallon@Tceq.Texas.Gov>
Sent: Thursday, April 24, 2025 4:23 PM

To: Bryan, Jordan (EthosEnergy) <Jordan.Bryan@ethosenergy.com>
Subject: Application to Renew Permit No. WQ0004288000; Wolf Hollow Services, LLC; Wolf Hollow I

Good Afternoon,

Please see the attached Notice of Deficiency letter dated April 24, 2025 requesting additional information needed to declare the application administratively complete. Please send the complete response by May 8, 2025.

Please let me know if you have any questions.

Thank you,

Leah Whallon
Texas Commission on Environmental Quality
Water Quality Division
512-239-0084
leah.whallon@tceq.texas.gov

How is our customer service? Fill out our online customer satisfaction survey at www.tceq.texas.gov/customersurvey

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

APPLICATION TO TRANSFER A WASTEWATER PERMIT OR CAFO PERMIT

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

SECTION 1. CURRENT PERMIT INFORMATION

What is the Permit Number? WQ0004288000

What is the EPA I.D. Number? TX not applicable

What is the Current Name on the Permit?

Wolf Hollow Services, LLC

What is the Customer Number (CN) for the current permittee? CN 604896670

What is the Regulated Entity Reference Number (RN): RN 100219195

For Publicly Owned Treatment Works (POTWs) Only:

a) Does this permit require implementation of an approved pretreatment program by the POTW? Yes ☐ No ☐

b) Does this permit have a domestic reclaimed water authorization associated with it? NOTE: **The domestic reclaimed water authorization associated with this permit will be cancelled on the same date the transfer took place**. See instructions for more information.
Yes ☐ No ☐

SECTION 2. FACILITY OWNER (APPLICANT) INFORMATION

A. What is the Legal Name of the facility owner?

Wolf Hollow I Power, LLC

B. What is the Customer Number (CN) issued to this entity? CN 600130132

C. Complete and attach a Core Data Form (TCEQ-10400) for this customer.

SECTION 3. CO-APPLICANT INFORMATION

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

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

B. What is the Customer Number (CN) issued to this entity? CN

C. Complete and attach a Core Data Form (TCEQ-10400) for this customer.

SECTION 4. APPLICATION CONTACT INFORMATION

This is the person TCEQ will contact if additional information is needed about this application.

Application Contact First and Last Name: Rex LaMew

Title: Facility Manager Credentials:

Company Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court

City, State, and Zip Code: Granbury, TX 76048

Phone Number: 817-579-4778 Fax Number:

E-mail Address: rex.lamew@ethosenergy.com

SECTION 5. PERMIT CONTACT INFORMATION

This is the person TCEQ will contact if additional information is needed during the term of the permit.

Permit Contact First and Last Name: Rex LaMew

Title: Facility Manager Credentials:

Company Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court

City, State, and Zip Code: Granbury, TX 76048

Phone Number: 817-579-4778 Fax Number:

E-mail Address: rex.lamew@ethosenergy.com

SECTION 6. SITE INFORMATION

Site Name: Wolf Hollow I

SECTION 7. LEASE AND EASEMENT REQUIREMENTS

A. Landowner where the facility is or will be located:

Landowner Name: Wolf Hollow I Power, LLC

If this individual is not the same person as the facility owner or co-applicant, attach one of the following documents:

- A lease agreement or deed recorded easement, if the facility is NOT a fixture of the land, or
- A deed recorded easement if the facility IS a fixture of the land.

B. Landowner of the effluent disposal site:

Landowner Name: not applicable

If this individual is not the same person as the facility owner or co-applicant, attach a lease agreement.

C. For CAFOs: Attach the following records:

- Warranty Deed or Property Tax Records
- Lease Agreement (for land management units that are not owned by the facility owner or co-applicant)

Facility Size on the proof of ownership, in acres:

SECTION 8. TRANSFER DATE

What is the date that the transfer of operator or ownership will occur? 5/2/2025

SECTION 9. REPORTING AND BILLING INFORMATION

A. Please identify the individual for receiving the reporting forms.

First and Last Name: Jordan Bryan

Title: HSE Manager Credentials:

Company Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court

City, State, and Zip Code: Granbury, TX 76048

Phone Number: 817-579-4720 Fax Number:

E-mail Address: jordan.bryan@ethosenergy.com

B. Please identify the individual for receiving the annual fee invoices.

First and Last Name: Dave Areno

Title: Business Manager Credentials:

Company Name: Wolf Hollow I Power, LLC

Mailing Address: 9201 Wolf Hollow Court

City, State, and Zip Code: Granbury, TX 76048

Phone Number: 817-579-4708 Fax Number:

E-mail Address: dave.areno@ethosenergy.com

SECTION 10. DELINQUENT FEES OR PENALTIES

Do you owe fees to the TCEQ? Yes ☐ No ☒

Do you owe any penalties to the TCEQ? Yes ☐ No ☒

If you answered yes to either of the above questions, provide the amount owed, the type of fee or penalty, and an identifying number.

TRANSFEROR SIGNATURE (Current Facility Owner)

I consent to the transfer of the permit and 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 Section 305.44 to sign this document and can provide documentation in proof of such authorization upon request.

Facility Owner Name: Wolf Hollow Services, LLC Daniel Inemer

Title: V.P. Operations

Signature: _____ Date: 5/7/2025

SUBSCRIBED AND SWORN to before me by the said Daniel Inemer on

this 7th day of May, 20 25

My commission expires on the 2nd day of December, 20 25

(Seal)

PATRECE MCFARLAND
Notary Public, State of Texas
Comm. Expires 12-02-2025
Notary ID 129640619

Notary Public

Tarrant
County, Texas

TRANSFEROR SIGNATURE (Current Facility Co-Applicant)

Complete if a co-applicant is on the current permit.

I consent to the transfer of the permit and 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 Section 305.44 to sign this document and can provide documentation in proof of such authorization upon request.

Facility Co-Applicant Name:

Title:

Signature: _____ Date: _____

SUBSCRIBED AND SWORN to before me by the said _____ on

this _____ day of _____, 20_____

My commission expires on the _____ day of _____, 20_____

(Seal)

_____
Notary Public

_____
County, Texas

TRANSFEREE SIGNATURE (New Facility Owner)

I certify that a change of ownership of the facility for the subject permit has been issued will occur as indicated in the application. As a condition of the transfer, I do hereby declare that:

The transferee will be the owner of the existing treatment facility from which wastewater is discharged, deposited or disposed or the facilities required to comply with the permit will be constructed as described in the application considered by the TCEQ prior to the issuance of the permit.

The transferee possesses a copy of the permit, understands the terms and conditions therein, and does accept and assume all obligations of the permit.

The transferee assumes financial responsibility for the proper maintenance and operation of all waste treatment and disposal facilities required by the permit or which may be required to comply with the permit terms and conditions. The transferee certifies that the transfer is not made for the purpose of avoiding liability for improper actions carried out prior to the date of transfer. Neither is the transfer made for the purpose of transferring responsibility for improper operations to an insolvent entity.

The transferee certifies under penalty of law that this document 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 known violations and revocation of this permit.

New Facility Owner: Wolf Hollow I Power, LLC

Title: HSE Manager

Signature: _____ Date: 5.5.25

SUBSCRIBED AND SWORN to before me by the said Jordan Bryan on

this 5th day of May, 2025

My commission expires on the 5th day of May, 2025

_____
Notary Public

(Seal)

Shelbi E. Wilson
My Commission Expires
7/13/2026
Notary ID131576070

Parker
County, Texas

TRANSFEREE SIGNATURE (New Facility Co-Applicant)

Complete if a co-applicant is required.

I certify that a change of ownership of the facility for the subject permit has been issued will occur as indicated in the application. As a condition of the transfer, I do hereby declare that:

The transferee will be the operator of the existing treatment facility from which wastewater is discharged, deposited or disposed or the facilities required to comply with the permit will be constructed as described in the application considered by the TCEQ prior to the issuance of the permit.

The transferee possesses a copy of the permit, understands the terms and conditions therein, and does accept and assume all obligations of the permit.

The transferee assumes financial responsibility for the proper maintenance and operation of all waste treatment and disposal facilities required by the permit or which may be required to comply with the permit terms and conditions. The transferee certifies that the transfer is not made for the purpose of avoiding liability for improper actions carried out prior to the date of transfer. Neither is the transfer made for the purpose of transferring responsibility for improper operations to an insolvent entity.

The transferee certifies under penalty of law that this document 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 known violations and revocation of this permit.

New Facility Co-Applicant:

Title:

Signature:_____ Date:_____

SUBSCRIBED AND SWORN to before me by the said _____on

this_____day of_____, 20_____

My commission expires on the_____day of_____, 20_____

(Seal)

_____
Notary Public

_____
County, Texas

SITE OPERATOR SIGNATURE

Complete only for permits that include composting facilities, land application and/or disposal of sewage sludge **AND** the transferee does not own the land where the disposal activity is conducted.

I understand that I am responsible for operating the site described in the legal description in accordance with the Texas Commission on Environmental Quality requirements in 30 TAC, Chapter 332 and/or 312, the conditions set forth in the permit, and any additional conditions as required by the Texas Commission on Environmental Quality. I also certify under penalty of law that all information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine, imprisonment for violations, and revocation of this permit.

Site Operator Name:

Title:

Signature:_____ Date:_____

SUBSCRIBED AND SWORN to before me by the said _____on

this_____day of_____, 20_____

My commission expires on the_____day of_____, 20_____

_____

(Seal) Notary Public

_____

County, Texas

LAND OWNER SIGNATURE

Complete Only If Landowner Is Not the Site Operator

I certify that I am the owner of the land described in this application and have all rights and covenants to authorize the applicant for this permit, to use this site for the composting, disposal and/or land application. I understand that 30 Texas Administrative Code Chapters 332 and 312 require me to make a reasonable effort to see that the applicant complies with requirements in 30 Texas Administrative Code Chapters 332 and 312, the conditions set forth in this application, and any additional conditions as required by the Texas Commission on Environmental Quality. I also certify under penalty of law that all information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine, imprisonment for violations, and revocation of this permit.

Landowner Name:

Signature:_____Date:_____

SUBSCRIBED AND SWORN to before me by the said _____on

this_____day of_____, 20_____

My commission expires on the_____day of_____, 20_____

(Seal)

_____
Notary Public

_____
County, Texas

ATTACHMENT 1

INDIVIDUAL INFORMATION

Section 1. Individual Information

Complete this attachment if the facility applicant or co-applicant is an individual. Make additional copies of this attachment if both are individuals.

Prefix (Mr., Ms., Miss):

Full legal name (first, middle, last):

Driver's License or State Identification Number:

Date of Birth:

Mailing Address:

City, State, and Zip Code:

Phone Number: Fax Number:

E-mail Address:

CN:

For Commission Use Only:
Customer Number:
Regulated Entity Number:
Permit Number:

INSTRUCTIONS

This application applies to:

- Industrial and municipal permits authorized under 30 TAC Chapter 305.
- CAFO permits authorized under 30 TAC Chapter 321
- Domestic Reclaimed Water Authorizations authorized under 30 TAC Chapter 210

A permit must be transferred when a change in ownership or co-permittee occurs. A transfer application is only required for a change in operator if the operator is, or is required to be, a co-permittee on the current permit.

A transfer application must be submitted at least 30 days before the proposed transfer date.

Where to Send the Application Form

A Core Data Form and one original and one copy of the application, including attachments, must be provided to the address below:

Regular U.S. Mail:

Texas Commission on Environmental Quality
Applications Review and Processing Team, MC 148
PO Box 13087
Austin TX 78711-3087

For Express Mail or Hand Delivery:

Texas Commission on Environmental Quality
Applications Review and Processing Team, MC 148
Building F Room 2101
12100 Park 35 Circle
Austin TX 78753

TCEQ Contact List

Permit Information and Application Forms:	512-239-4671
Technical Information	512-239-4671
Environmental Law Division:	512-239-0600
Stream Survey and Receiving Water Assessment:	512-239-4671
Biomonitoring Testing Requirements:	512-239-4592

Copies of records on file with the TCEQ may be obtained for a minimal fee from the Records Management Office at 512-239-2900.

Application Fee

An application fee of $100.00 must be paid by check or money order made payable to the Texas Commission on Environmental Quality. Fees must be sent under separate cover making reference to the type of application, name of applicant, and permit number of existing permit.

Mail the application fee to:
Texas Commission on Environmental Quality
Revenues Section, MC 214
PO Box 13088
Austin TX 78711-3088

To verify receipt of payment or any other questions you may have regarding payment of fees to the TCEQ, you may call the Revenues Section, Cashiers Office at (512) 239-0357.

Who Is Responsible and Liable for Compliance With The Permit Or Registration During Transfer Activities

The entity/individual to whom a permit is issued is held responsible and liable for complying with the terms and conditions of the permit. The permit may be transferred upon approval by the Texas Commission on Environmental Quality (TCEQ). An attempted transfer is not effective for any purpose until approved, in writing, by the TCEQ.

If no agreement regarding transfer of permit responsibility and liability is provided, responsibility for compliance with the terms and conditions of the permit and liability for any violation is assumed by the transferee, effective on the date of the approved transfer. This section is not intended to relieve a transferor of any liability.

If a person attempting to acquire a permit operates the facility before transfer approval is given, such person shall be considered to be operating without a permit.

The TCEQ may refuse to approve a transfer where conditions of a judicial decree, compliance agreement, or other enforcement order have not been entirely met.

Current Permit Information

Provide the TCEQ permit number for the authorization being transferred.

Provide the EPA I.D. number for the permit being transferred.

Provide the current name on the permit. The information provided must match the current permit exactly.

Provide the customer number (CN) for the current permittee. TCEQ assigns each customer a number that begins with CN, followed by nine digits. This is not a permit number, registration number, or license number. The Customer Number, for the current permittee, is available at the following website: http://www15.tceq.texas.gov/crpub/.

Provide the regulated entity reference number (RN) for the site. The RN is a number issued by TCEQ to sites where an activity is regulated by TCEQ. This is not a permit number, registration number, or license number. The RN is available at the following website: http://www15.tceq.texas.gov/crpub/.

For Publicly Owned Treatment Works (POTWs):

- Indicate if this permit requires the POTW to implement an approved pretreatment program. The transferee must contact the Storm Water & Pretreatment Team staff before this application may be transferred.
- Indicate if this permit has an associated domestic reclaimed water authorization. **The domestic reclaimed water authorization associated with this permit will be cancelled on the same date the transfer took place**. If the new owner wants to obtain a domestic reclaimed water authorization, please complete and submit the Application to Use Domestic Reclaimed Water (TCEQ-20427).

Facility Owner (Applicant) and Co-Applicant Information

Provide the name(s) and complete and attach a Core Data Form (TCEQ-10400) for these customers.

Texas Pollutant Discharge Elimination System (TPDES) permits: it is the duty of the facility operator to submit an application for a permit as co-permittee with the facility owner when the operator is contracted by the owner. The operator is not required to apply as co-permittee when the operator is an employee of the facility owner. If the owner of the facility is not the same as the owner of the land, please see Lease and Easement Requirements in the next section below.

Texas Land Application Permits: it is the duty of the owner of the facility to submit an application for a permit. If the owner of the facility is not the same as the owner of the land, please see Lease and Easement Requirements in the next section below. In special circumstances, it is the duty of the owner and the operator of the treatment facility to submit an application for a permit, as co-permittees.

CAFOs: the owner of the land must be either the applicant or co-applicant. If the owner of the facility is a separate entity or individual, then the owner of the facility must be included as the applicant or co-applicant. For all CAFO TPDES permits, the operator must be listed as a co-applicant. A signature page must be completed for each applicant. A copy of a recorded deed or tax records showing ownership, or a copy of a contract or lease agreement between the applicant and the owner/operator of any lands to be utilized under the CAFO must be provided. This requirement does not apply to any lands not owned, operated, or controlled by the applicant for the purpose of off-site land application of manure if the manure is given or sold to others for beneficial use, provided the owner/operator of the CAFO is not involved in the application of the manure.

Application Contact Information

Provide the name and contact information for the person that TCEQ will contact if additional information is needed about this application.

Permit Contact Information

Provide the name and contact information for the person that TCEQ will contact if additional information is needed during the term of the permit or registration.

Site Information

Provide the name of the site as known by the public in the area where the site is located.

Lease and Easement Requirements

Provide the name and contact information for the owner where the facility is or will be located if the landowner is not the applicant or co-applicant.

Provide the name and contact information for the owner of the effluent disposal site if the landowner is not the applicant or co-applicant.

If the owner of the land on which the treatment facility is located is different from the owner of the treatment facility and the treatment facility is not a fixture of the land, the applicant must provide a copy of a lease agreement or recorded easement giving the applicant authorization to use the land on which the treatment plant is located for at least the term of the permit.

If the owner of the land on which the treatment facility is located is different from the owner of the treatment facility and the treatment facility is a fixture of the land, (Example: pond system, evaporation pond, units halfway in ground, holding ponds, etc.) the owner of the land will need to provide a copy of a deed recorded easement giving the applicant sufficient property rights to use the land for the life of the facility, or apply as a co-permittee with the owner of the treatment facility.

If the applicant does not own the land where the effluent disposal site is located, the applicant must provide a copy of a lease agreement which includes a term of at least 5 years, and is current or if the lease term has passed it includes an option to renew the term, and is between the current applicant and the landowner.

For CAFOs: A copy of a recorded deed or tax records showing ownership, or a copy of a contract or lease agreement between the applicant and the owner/operator of any lands to be utilized under the CAFO must be provided. This requirement does not apply to any lands not owned, operated, or controlled by the applicant for the purpose of off-site land application of manure if the manure is given or sold to others for beneficial use, provided the owner/operator of the CAFO is not involved in the application of the manure.

Transfer Date

Provide the date that the transfer of ownership or operator will occur. Please note that this transfer application will not be processed until after the transfer date provided in this application. If the anticipated transfer date changes, the transferee or the transferor must notify the Applications Review and Process Team in writing, prior to the transfer date provided in this application.

Reporting and Billing Information

Provide the name and contact information for the individual that will receive the reporting forms and the annual fee invoices.

The water quality fee is assessed annually for each permit that is active on September 1

Pursuant to 30 TAC, Section 305.66, failure to pay fees is good cause for permit denial or revocation. If an applicant has outstanding fees, a proposed permit application will not be considered for approval by the Commission or Executive Director. For account balance information, contact the Financial Administration Division, Revenue Section, at (512) 239-0344.

Delinquent Fees and Penalties

The TCEQ will not issue, amend, or renew permits, registrations, certifications, or licenses to an entity or person who is delinquent on a penalty or fee owed to the TCEQ. The TCEQ will not declare any application administratively complete that is submitted by a person or entity who is delinquent on a fee or penalty until the fee or penalty is paid, or if on an approved installment plan, that payments under the plan are current. The TCEQ will withhold final action on an application until the fee or penalty is paid and the account is current, if after the application is considered administratively complete, we discover that the owner or entity who submitted the application is delinquent on a fee or penalty.

The following TCEQ website will help you determine if you owe any fees or penalties to the TCEQ and how to make a payment: https://www.tceq.texas.gov/agency/fees/delin/index.html. If fees or penalties are owed, please identify the type of fee or penalty owed, the amount owed, and the TCEQ identifying number. For penalties, please provide the TCEQ docket number

For questions about delinquent fees and penalties, contact the Financial Administration Division, Revenue Section, at 512-239-0354.

Signature Requirements

In accordance with 30 Texas Administrative Code §305.44 relating to Signatories to Applications, all applications shall be signed as follows:

For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency,

or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

The signature page must bear the seal of a notary public. The date signed by the applicant must be the same as the date notarized. The signature page will not be acceptable if the dates are different.

If the transferee is unable to obtain the signature of the transferor, the permit may still be transferred by involuntary transfer if:

- the current permittee no longer owns the permitted facilities
- the facilities have not been built and the permittee no longer has sufficient property rights in the site of the proposed facilities
- proof of ownership of the site and treatment facility has been provided by the transferee
- the executive director has provided notice by certified mail to the permittee, using the last address of record, giving an opportunity for hearing
- the executive director did not receive a request for hearing from the permittee within 30 days from the date the notice was mailed.

• Attachment 1 Individual Information

If the applicant or co-applicant is an individual, provide information on the individual as required by the Texas Water Code. The address provided must be the individual's home address.

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing 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 **Form TCEQ-20031**

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 600130132		RN 100219195

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:*

Wolf Hollow I Power, LLC

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*
0012591611	15419669450	54-1966945	01-884-0392

11. Type of Customer: ☒ Corporation ☐ Individual Partnership: ☐ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☐ 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 ☐ Other:
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant

15. Mailing Address:	9201 Wolf Hollow Court						
	City	Granbury	**State**	TX	**ZIP**	76048	**ZIP + 4**	7741

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

18. Telephone Number	**19. Extension or Code**	**20. Fax Number** *(if applicable)*

(817) 579-4703		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☐ 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 Core 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.)*

Wolf Hollow I Power

23. Street Address of the Regulated Entity: ***(No PO Boxes)***	9201 Wolf Hollow Court							
	City	Granbury	**State**	TX	**ZIP**	76048	**ZIP + 4**	7741
24. County								

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:					
26. Nearest City			**State**	**Nearest ZIP Code**	

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:	32.333248		**28. Longitude (W) In Decimal:**	-97.733504	
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)
4911		221112	

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

Electric Power Generation

34. Mailing Address:	9201 Wolf Hollow Court							
	City	Granbury	**State**	TX	**ZIP**	76048	**ZIP + 4**	7741
35. E-Mail Address:								

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

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	☒ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:
	WQ0004288000			

SECTION IV: Preparer Information

40. Name:	Jordan Bryan	41. Title:	HSE Manager

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(817) 579-4720		( ) -	jordan.bryan@ethosenergy.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:	Wolf Hollow I Power, LLC	Job Title:	Facility Manager
Name *(In Print)*:	REX LAMEW	Phone:	(817) 579- 4778
Signature:	Rex LaMew	Date:	5-5-2025

March 27, 2024

Via overnight delivery and electronic mail
Texas Commission on Environmental Quality
Compliance Monitoring Team
Mail Code 224 Enforcement
Division P.O. Box 13087 Austin, TX 78711-3087

Re: Delegation of Signatory Authority
Wolf Hollow Power I, LLC
CN 604896670; RN 100219195
TPDES Permit No. WQ0004288000

Dear Sir or Madam,

In my capacity as President and CFO of Wolf Hollow Power I, LLC and in accordance with 30 TAC 305.44 and 305.128, I hereby appoint the following positions as Duly Authorized Representatives and hereby authorize and delegate to the following positions all authority necessary to execute any and all certifications,, reports, notifications and/or submittals as may be required by the Clean Water Act, 33 USC 1251 et seq., the federal regulations adopted thereunder and all comparable Texas state environmental laws and regulations.

1. Those individuals serving in the capacity and holding title of "Facility Manager" for Wolf Hollow Power I, LLC

2. Those individuals serving in the capacity and holding title of "Health, Safety and Environmental Manager" for Wolf Hollow Power I, LLC.

The above-referenced delegations of authority will remain in effect until revoked or superseded.

Sincerely,

DocuSigned by:
Alexander Adotevi
387773CB178844A...
Alexander ADOTEVI
President and CFO
Wolf Hollow Power I, LLC

Comisión de Calidad Ambiental del Estado de Texas

AVISO DE RECIBO DE LA SOLICITUD Y
EL INTENTO DE OBTENER PERMISO PARA LA CALIDAD DEL AGUA
RENOVACION

PERMISO NO. WQ000

SOLICITUD. *Wolf Hollow Services, LLC, 9201 Wolf Hollow Court, Granbury, Texas 76048, que posee una planta de generación de energía eléctrica de ciclo combinado a gas natural*, ha solicitado a la Comisión de Calidad Ambiental del Estado de Texas (TCEQ) para renovar el Permiso No. WQ00_____ (EPA I.D. No. TX _____) del Sistema de Eliminación de Descargas de Contaminantes de Texas (TPDES) para autorizar la descarga de aguas residuales tratadas en un volumen que no sobrepasa un flujo promedio diario de *1,243,000* galones por día. La planta está ubicada *9201 Wolf Hollow Court, cerca de la ciudad de Granbury,* en el Condado de *Hood*, Texas *76048*. La ruta de descarga es del sitio de la planta a *directamente al Río Brazos, debajo del Lago Granbury* . La TCEQ recibió esta solicitud el *15 de Abril de 2025*. La solicitud para el permiso estará disponible para leerla y copiarla en [*Hood County Library, 222 North Travis Street, Granbury, en el Condado de Hood, Texas* antes de la fecha de publicación de este aviso en el periódico. La solicitud (cualquier actualización y aviso inclusive) está disponible electrónicamente en la siguiente página web: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. Este enlace a un mapa electrónico de la ubicación general del sitio o de la instalación es proporcionado como una cortesía y no es parte de la solicitud o del aviso. Para la ubicación exacta, consulte la solicitud. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-97.731944,32.333056&level=18

AVISO DE IDIOMA ALTERNATIVO. El aviso de idioma alternativo en español está disponible en https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.

AVISO ADICIONAL. El Director Ejecutivo de la TCEQ ha determinado que la solicitud es administrativamente completa y conducirá una revisión técnica de la solicitud. Después de completar la revisión técnica, el Director Ejecutivo puede preparar un borrador del permiso y emitirá una Decisión Preliminar sobre la solicitud. **El aviso de la solicitud y la decisión preliminar serán publicados y enviado a los que están en la lista de correo de las personas a lo largo del condado que desean recibir los avisos y los que están en la lista de correo que desean recibir avisos de esta solicitud. El aviso dará la fecha límite para someter comentarios públicos.**

COMENTARIO PUBLICO / REUNION PUBLICA. Usted puede presentar comentarios públicos o pedir una reunión pública sobre esta solicitud. El propósito de una reunión pública es dar la oportunidad de presentar comentarios o hacer preguntas acerca de la solicitud. La TCEQ

realiza una reunión pública si el Director Ejecutivo determina que hay un grado de interés público suficiente en la solicitud o si un legislador local lo pide. Una reunión pública no es una audiencia administrativa de lo contencioso.

OPORTUNIDAD DE UNA AUDIENCIA ADMINISTRATIVA DE LO CONTENCIOSO. Después del plazo para presentar comentarios públicos, el Director Ejecutivo considerará todos los comentarios apropiados y preparará una respuesta a todo los comentarios públicos esenciales, pertinentes, o significativos. **A menos que la solicitud haya sido referida directamente a una audiencia administrativa de lo contencioso, la respuesta a los comentarios y la decisión del Director Ejecutivo sobre la solicitud serán enviados por correo a todos los que presentaron un comentario público y a las personas que están en la lista para recibir avisos sobre esta solicitud. Si se reciben comentarios, el aviso también proveerá instrucciones para pedir una reconsideración de la decisión del Director Ejecutivo y para pedir una audiencia administrativa de lo contencioso.** Una audiencia administrativa de lo contencioso es un procedimiento legal similar a un procedimiento legal civil en un tribunal de distrito del estado.

PARA SOLICITAR UNA AUDIENCIA DE CASO IMPUGNADO, USTED DEBE INCLUIR EN SU SOLICITUD LOS SIGUIENTES DATOS: su nombre, dirección, y número de teléfono; el nombre del solicitante y número del permiso; la ubicación y distancia de su propiedad/actividad con respecto a la instalación; una descripción específica de la forma cómo usted sería afectado adversamente por el sitio de una manera no común al público en general; una lista de todas las cuestiones de hecho en disputa que usted presente durante el período de comentarios; y la declaración "[Yo/nosotros] solicito/solicitamos una audiencia de caso impugnado". Si presenta la petición para una audiencia de caso impugnado de parte de un grupo o asociación, debe identificar una persona que representa al grupo para recibir correspondencia en el futuro; identificar el nombre y la dirección de un miembro del grupo que sería afectado adversamente por la planta o la actividad propuesta; proveer la información indicada anteriormente con respecto a la ubicación del miembro afectado y su distancia de la planta o actividad propuesta; explicar cómo y porqué el miembro sería afectado; y explicar cómo los intereses que el grupo desea proteger son pertinentes al propósito del grupo.

Después del cierre de todos los períodos de comentarios y de petición que aplican, el Director Ejecutivo enviará la solicitud y cualquier petición para reconsideración o para una audiencia de caso impugnado a los Comisionados de la TCEQ para su consideración durante una reunión programada de la Comisión.

La Comisión sólo puede conceder una solicitud de una audiencia de caso impugnado sobre los temas que el solicitante haya presentado en sus comentarios oportunos que no fueron retirados posteriormente. **Si se concede una audiencia, el tema de la audiencia estará limitado a cuestiones de hecho en disputa o cuestiones mixtas de hecho y de derecho relacionadas a intereses pertinentes y materiales de calidad del agua que se hayan presentado durante el período de comentarios. Si ciertos criterios se cumplen, la TCEQ puede actuar sobre una solicitud para renovar un permiso sin proveer una oportunidad de una audiencia administrativa de lo contencioso.**

LISTA DE CORREO. Si somete comentarios públicos, un pedido para una audiencia administrativa de lo contencioso o una reconsideración de la decisión del Director Ejecutivo,

la Oficina del Secretario Principal enviará por correo los avisos públicos en relación con la solicitud. Además, puede pedir que la TCEQ ponga su nombre en una o más de las listas correos siguientes (1) la lista de correo permanente para recibir los avisos del solicitante indicado por nombre y número del permiso específico y/o (2) la lista de correo de todas las solicitudes en un condado especifico. Si desea que se agrega su nombre en una de las listas designe cual lista(s) y envía por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

INFORMACIÓN DISPONIBLE EN LÍNEA. Para detalles sobre el estado de la solicitud, favor de visitar la Base de Datos Integrada de los Comisionados en www.tceq.texas.gov/goto/cid. Para buscar en la base de datos, utilizar el número de permiso para esta solicitud que aparece en la parte superior de este aviso.

CONTACTOS E INFORMACIÓN A LA AGENCIA. Todos los comentarios públicos y solicitudes deben ser presentadas electrónicamente vía http://www14.tceq.texas.gov/epic/eComment/ o por escrito dirigidos a la Comisión de Texas de Calidad Ambiental, Oficial de la Secretaría (Office of Chief Clerk), MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Tenga en cuenta que cualquier información personal que usted proporcione, incluyendo su nombre, número de teléfono, dirección de correo electrónico y dirección física pasarán a formar parte del registro público de la Agencia. Para obtener más información acerca de esta solicitud de permiso o el proceso de permisos, llame al programa de educación pública de la TCEQ, gratis, al 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040.

También se puede obtener información adicional del *Wolf Hollow Services, LLC* a la dirección indicada arriba o llamando a *Mr. Jordan Bryan* al *817-579-4720*.

Fecha de emisión: *[Date notice issued]*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 15, 2025

Re: Confirmation of Submission of the Renewal with changes for Industrial Wastewater Authorization.

Dear Applicant:

This is an acknowledgement that you have successfully completed Renewal with changes for the Industrial Wastewater authorization.

ER Account Number: ER065353
Application Reference Number: 775329
Authorization Number: WQ0004288000
Site Name: Wolf Hollow I
Regulated Entity: RN100219195 - Wolf Hollow I
Customer(s): CN604896670 - Wolf Hollow Services, LLC

Please be aware that TCEQ staff may contact your designated contact for any additional information.

If you have any questions, you may contact the Applications Review and Processing Team by email at WQ-ARPTeam@tceq.texas.gov or by telephone at (512) 239-4671.

Sincerely,
Applications Review and Processing Team
Water Quality Division

Wolf Hollow I
TPDES WQ0004288000 Renewal Application 2025

Application Contents

Attachments

		Cross-reference to Application Item
SPIF-1	Supplemental Permit Information Form (SPIF)	AR
SPIF-2	USGS Maps (Nemo, Hill City quads)	SPIF-7
PLS-1	Plain Language Summary	AR1.0-9.f
A-1	USGS Maps (Nemo, Hill City quads)	AR1.0-11.b
T-1	Facility Description	TR-2.a
	Table 1. Wastewater Flows by Outfall	TR-2.b, 4; W1-3
	Figure 1. Process Flow Diagram	TR-2.b
	Figure 2. Facility Map	TR-1.d
T-2	Cooling Water System	W11.0-11.3
	Table 1. Design Intake Flow	W11.0-1.a
	Table 2. Wolf Hollow Monthly Average Intake Flows (MGD) Jan 2020 - Dec 2024	W11.0-4.a.1
	Table 3. Wolf Hollow I Capacity Utilization Rate Jan 2020 - Dec 2024	W11.0-4.a.1
	Table 4. Lake Granbury Characteristics	W11.0-3
	Figure 1. Site Location Map	W11.0-1.b.2
	Figure 2. Location of CWIS	W11.0-1.b.2
	Figure 3. Lake Granbury Contours	W11.0-3.b.3
	Figure 4. CWIS Area of Influence	W11.0-3.b.4
	Appendix 1. Wolf Hollow CWIS Structural Detail	W11.0-1.b.2
	Appendix 2. 2021 Granbury Reservoir Fisheries Report	W11.2-1.b
T-3	Treatment Chemicals and SDSs	TR-5.b

Reference Key

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

Texas Commission on Environmental Quality

Update Domestic or Industrial Individual Permit

WQ0004288000

Site Information (Regulated Entity)

What is the name of the site to be authorized?	WOLF HOLLOW I
Does the site have a physical address?	Yes
Physical Address	
Number and Street	9201 WOLF HOLLOW CT
City	GRANBURY
State	TX
ZIP	76048
County	HOOD
Latitude (N) (##.######)	32.333056
Longitude (W) (-###.######)	-97.731944
Primary SIC Code	4911
Secondary SIC Code	
Primary NAICS Code	221119
Secondary NAICS Code	
Regulated Entity Site Information	
What is the Regulated Entity's Number (RN)?	RN100219195
What is the name of the Regulated Entity (RE)?	WOLF HOLLOW I
Does the RE site have a physical address?	Yes
Physical Address	
Number and Street	9201 WOLF HOLLOW CT
City	GRANBURY
State	TX
ZIP	76048
County	HOOD
Latitude (N) (##.######)	32.333611
Longitude (W) (-###.######)	-97.733611
Facility NAICS Code	
What is the primary business of this entity?	Power Generation

Wolf Ho-Customer (Applicant) Information (Owner)

How is this applicant associated with this site?	Owner
What is the applicant's Customer Number (CN)?	CN604896670
Type of Customer	Corporation

Full legal name of the applicant:	
Legal Name	Wolf Hollow Services, LLC
Texas SOS Filing Number	802039155
Federal Tax ID	
State Franchise Tax ID	32054794014
State Sales Tax ID	
Local Tax ID	
DUNS Number	
Number of Employees	
Independently Owned and Operated?	
I certify that the full legal name of the entity applying for this permit has been provided and is legally authorized to do business in Texas.	Yes
Responsible Authority Contact	
Organization Name	Wolf Hollow Services, LLC
Prefix	
First	REX
Middle	
Last	LAMEW
Suffix	
Credentials	
Title	FACILITY MANAGER
Responsible Authority Mailing Address	
Enter new address or copy one from list:	RE Physical Address
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	9201 WOLF HOLLOW CT
Routing (such as Mail Code, Dept., or Attn:)	
City	GRANBURY
State	TX
ZIP	76048
Phone (###-###-####)	8175794778
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	rex.lamew@ethosenergy.com

Billing Contact

Responsible contact for receiving billing statements:	
Select the permittee that is responsible for payment of the annual fee.	CN604896670, Wolf Hollow Services, LLC

Organization Name	WOLF HOLLOW I POWER LLC
Prefix	
First	DAVE
Middle	
Last	ARENO
Suffix	
Credentials	
Title	BUSINESS MANAGER
Enter new address or copy one from list:	RE Physical Address
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	9201 WOLF HOLLOW CT
Routing (such as Mail Code, Dept., or Attn:)	
City	GRANBURY
State	TX
ZIP	76048
Phone (###-###-####)	8175794708
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	dave.areno@ethosenergy.com

Application Contact

Person TCEQ should contact for questions about this application:

Same as another contact?	
Organization Name	WOLF HOLLOW I POWER LLC
Prefix	MR
First	JORDAN
Middle	
Last	BRYAN
Suffix	
Credentials	
Title	HSE MANAGER
Enter new address or copy one from list:	RE Physical Address
Mailing Address	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	9201 WOLF HOLLOW CT
Routing (such as Mail Code, Dept., or Attn:)	
City	GRANBURY

State	TX
ZIP	76048
Phone (###-###-####)	8175794720
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	jordan.bryan@ethosenergy.com

Technical Contact

Person TCEQ should contact for questions about this application:

Same as another contact?	Application Contact
Organization Name	WOLF HOLLOW I POWER LLC
Prefix	MR
First	JORDAN
Middle	
Last	BRYAN
Suffix	
Credentials	
Title	HSE MANAGER
Enter new address or copy one from list:	

Mailing Address

Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	9201 WOLF HOLLOW CT
Routing (such as Mail Code, Dept., or Attn:)	
City	GRANBURY
State	TX
ZIP	76048
Phone (###-###-####)	8175794720
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	jordan.bryan@ethosenergy.com

DMR Contact

Person responsible for submitting Discharge Monitoring Report Forms:

Same as another contact?	Technical Contact
Organization Name	WOLF HOLLOW I POWER LLC
Prefix	MR

First	JORDAN
Middle	
Last	BRYAN
Suffix	
Credentials	
Title	HSE MANAGER
Enter new address or copy one from list:	RE Physical Address
Mailing Address:	
Address Type	Domestic
Mailing Address (include Suite or Bldg. here, if applicable)	9201 WOLF HOLLOW CT
Routing (such as Mail Code, Dept., or Attn:)	
City	GRANBURY
State	TX
ZIP	76048
Phone (###-###-####)	8175794720
Extension	
Alternate Phone (###-###-####)	
Fax (###-###-####)	
E-mail	jordan.bryan@ethosenergy.com

Section 1# Permit Contact

Permit Contact#: 1

Person TCEQ should contact throughout the permit term.

1) Same as another contact?	CN604896670, Wolf Hollow Services, LLC
2) Organization Name	Wolf Hollow Services, LLC
3) Prefix	MR
4) First	REX
5) Middle	
6) Last	LAMEW
7) Suffix	
8) Credentials	
9) Title	FACILITY MANAGER
Mailing Address	
10) Enter new address or copy one from list	RE Physical Address
11) Address Type	Domestic
11.1) Mailing Address (include Suite or Bldg. here, if applicable)	9201 WOLF HOLLOW CT
11.2) Routing (such as Mail Code, Dept., or Attn:)	
11.3) City	GRANBURY

11.4) State	TX
11.5) ZIP	76048
12) Phone (###-###-####)	8175794778
13) Extension	
14) Alternate Phone (###-###-####)	
15) Fax (###-###-####)	
16) E-mail	rex.lamew@ethosenergy.com

Section 2# Permit Contact

Permit Contact#: 2

Person TCEQ should contact throughout the permit term.

1) Same as another contact?	Technical Contact
2) Organization Name	WOLF HOLLOW I POWER LLC
3) Prefix	MR
4) First	JORDAN
5) Middle	
6) Last	BRYAN
7) Suffix	
8) Credentials	
9) Title	HSE MANAGER

Mailing Address

10) Enter new address or copy one from list	RE Physical Address
11) Address Type	Domestic
11.1) Mailing Address (include Suite or Bldg. here, if applicable)	9201 WOLF HOLLOW CT
11.2) Routing (such as Mail Code, Dept., or Attn:)	
11.3) City	GRANBURY
11.4) State	TX
11.5) ZIP	76048
12) Phone (###-###-####)	8175794720
13) Extension	
14) Alternate Phone (###-###-####)	
15) Fax (###-###-####)	
16) E-mail	jordan.bryan@ethosenergy.com

Owner Information

Owner of Treatment Facility

1) Prefix	
2) First and Last Name	

3) Organization Name	WOLF HOLLOW I POWER LLC
4) Mailing Address	9201 WOLF HOLLOW COURT
5) City	GRANBURY
6) State	TX
7) Zip Code	76048
8) Phone (###-###-####)	8175794778
9) Extension	
10) Email	rex.lamew@ethosenergy.com
11) What is ownership of the treatment facility?	Private
Owner of Land (where treatment facility is or will be)	
12) Prefix	
13) First and Last Name	
14) Organization Name	WOLF HOLLOW SERVICES LLC
15) Mailing Address	9201 WOLF HOLLOW COURT
16) City	GRANBURY
17) State	TX
18) Zip Code	76048
19) Phone (###-###-####)	8175794778
20) Extension	
21) Email	rex.lamew@ethosenergy.com
22) Is the landowner the same person as the facility owner or co-applicant?	Yes

General Information Renewal-Amendment

1) Current authorization expiration date:	10/13/2025
2) Current Facility operational status:	Active
3) Is the facility located on or does the treated effluent cross American Indian Land?	No
4) What is the application type that you are seeking?	Renewal with changes
4.1) Describe the proposed changes:	Remove items related to Interim Phase because the facility is operating in Final Phase
5) Current Authorization type:	Industrial Wastewater
5.1) What is your EPA facility classification?	Major
5.1.1) Select the applicable fee	Renewal - $2,015
6) What is the classification for your authorization?	TPDES
6.1) What is the EPA Identification Number?	TX0123820
6.2) Is the wastewater treatment facility location in the existing permit accurate?	Yes

6.3) Are the point(s) of discharge and the discharge route(s) in the existing permit correct?	Yes
6.4) City nearest the outfall(s):	GRANBURY
6.5) County where the outfalls are located:	HOOD
6.6) Is or will the treated wastewater discharge to a city, county, or state highway right-of-way, or a flood control district drainage ditch?	No
6.7) Is the daily average discharge at your facility of 5 MGD or more?	No
7) Did any person formerly employed by the TCEQ represent your company and get paid for service regarding this application?	No

Public Notice Information

Individual Publishing the Notices

1) Prefix	MR
2) First and Last Name	JORDAN BRYAN
3) Credential	
4) Title	HSE MANAGER
5) Organization Name	WOLF HOLLOW I POWER LLC
6) Mailing Address	9201 WOLF HOLLOW CT
7) Address Line 2	
8) City	GRANBURY
9) State	TX
10) Zip Code	76048
11) Phone (###-###-####)	8175794720
12) Extension	
13) Fax (###-###-####)	
14) Email	jordan.bryan@ethosenergy.com

Contact person to be listed in the Notices

15) Prefix	MR
16) First and Last Name	JORDAN BRYAN
17) Credential	
18) Title	HSE MANAGER
19) Organization Name	WOLF HOLLOW I POWER LLC
20) Phone (###-###-####)	8175794720
21) Fax (###-###-####)	
22) Email	jordan.bryan@ethosenergy.com

Bilingual Notice Requirements

23) 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

23.1) Are the students who attend either the elementary school or the middle school enrolled in a bilingual education program at that school?	Yes
23.2) Do the students at these schools attend a bilingual education program at another location?	No
23.3) 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)?	No
23.4) Which language is required by the bilingual program?	SPANISH

Section 1# Public Viewing Information

County#: 1

1) County	HOOD
2) Public building name	HOOD COUNTY LIBRARY
3) Location within the building	
4) Physical Address of Building	222 NORTH TRAVIS STREET
5) City	GRANBURY
6) Contact Name	
7) Phone (###-###-####)	8175733569
8) Extension	
9) Is the location open to the public?	Yes

Plain Language

1) Plain Language

[File Properties]

File Name	LANG_Attachment PLS-1 Plain Language Summary WQ0004288000 2025.pdf
Hash	16AC1AC76B4E982871D2EEE05A9BE6A320C386D05A146BE92AFFA6DFA5DFDDEE
MIME-Type	application/pdf

Supplemental Permit Information Form

1) Supplemental Permit Information Form (SPIF)

[File Properties]

File Name	SPIF_SPIF-1 WQ0004288000 Supplemental Permit Information Form 2025.pdf
Hash	11B2370571B298CAA8AEB0CAFA86C053ACED569D880FD6282B5D525C53AB302D
MIME-Type	application/pdf

[File Properties]

File Name	SPIF_Attachment SPIF-2 USGS Maps

	WQ0004288000.pdf
Hash	05E4F9093860797625D6F8C367893E5B48DF7ADD411C1F0DC7362FF513D57FDC
MIME-Type	application/pdf

Industrial Attachments

1) Attach an 8.5"x11", reproduced portion of the most current and original USGS Topographic Quadrangle Map(s) that meets the 1:24,000 scale.

[File Properties]

File Name	MAP_Attachment A-1 USGS Maps WQ0004288000.pdf
Hash	8F96E8E8703673C34D08B4B1A93E69844EFE94D8EB9FA85B558194044A6CEA0E
MIME-Type	application/pdf

2) I confirm that all required sections of Technical Report 1.0 are complete and will be included in the Technical Attachment.	Yes
2.1) I confirm that Worksheet 2.0 (Pollutant Analyses Requirements) is complete and included in the Technical Attachment.	Yes
2.2) I confirm that Worksheet 4.0 (Receiving Waters) is complete and included in the Technical Attachment.	Yes
2.3) Are you planning to include Worksheet 4.1 (Waterbody Physical Characteristics) in the Technical Attachment?	No
2.4) Are you planning to include Worksheet 6.0 (Industrial Waste Contribution) in the Technical Attachment?	No
2.5) Are you planning to include Worksheet 7.0 (Stormwater Discharges Associated with Industrial Activities) to the Technical Attachment?	No
2.6) Are you planning to include Worksheet 8.0 (Aquaculture) in the Technical Attachment?	No
2.7) Are you planning to include Worksheet 9.0 (Class V Injection Well Inventory/Authorization) in the Technical Attachment?	No
2.8) Are you planning to include Worksheet 10.0 (Quarries in the John Graves Scenic Riverway) in the Technical Attachment?	No
2.9) Are you planning to include Worksheet 11.0 (Cooling Water System Information) in the Technical Attachment?	Yes
2.10) Are you planning to include Worksheet 11.1 (Impingement Mortality) in the Technical Attachment?	Yes
2.11) Are you planning to include Worksheet 11.2 (Source Water Biological Data) in the Technical Attachment?	Yes
2.12) Are you planning to include Worksheet 11.3 (Entrainment) in the Technical Attachment?	Yes

2.13) Technical Attachment

[File Properties]

File Name	TECH_Wolf Hollow I WQ0004288000 Technical

	Report 2025.pdf
Hash	57E502C1F1842DB6C20D98F1CDF6C8BEB3CAACFDC761554821EAFF6AA133E1F6
MIME-Type	application/pdf

3) Flow Diagram

[File Properties]

File Name	FLDIA_Figure 1 WH-I WQ0004288000 Process Flow Diagram.pdf
Hash	1A452B7C2DFE92709C4BCF70261E6592BF2450956954602D05059C16CC5A3AC9
MIME-Type	application/pdf

4) Site Drawing

[File Properties]

File Name	SITEDR_WQ0004288000 Wolf Hollow Facility Map.pdf
Hash	6E2C548135EA88B238C8A2C51A85FC93BC9091837D3FBFEE116E88DF3CCE1188
MIME-Type	application/pdf

5) Design Calculations

[File Properties]

File Name	DES_CAL_Table 1 WH-I WQ0004288000 Wastewater Flows by Outfall.pdf
Hash	9C75E3765D91C52FE3492C771DEC337CE4DC8DDAAD260AEDE79B0746C14C11C4
MIME-Type	application/pdf

6) Solids Management Plan

7) Water Balance

[File Properties]

File Name	WB_Table 1 WH-I WQ0004288000 Wastewater Flows by Outfall.pdf
Hash	9C75E3765D91C52FE3492C771DEC337CE4DC8DDAAD260AEDE79B0746C14C11C4
MIME-Type	application/pdf

[File Properties]

File Name	WB_Figure 1 WH-I WQ0004288000 Process Flow Diagram.pdf
Hash	1A452B7C2DFE92709C4BCF70261E6592BF2450956954602D05059C16CC5A3AC9
MIME-Type	application/pdf

8) Other Attachments

[File Properties]

File Name	OTHER_Attachment T-1 WH-I WQ0004288000 Facility Description 2025.pdf

Hash	A83270581AC0F2D4381F5D8A04355EDAE5D849EB76674736AB0A481255FA7F96
MIME-Type	application/pdf

[File Properties]

File Name	OTHER_Attachment T-2 WH-I WQ0004288000 Cooling Water System 2025.pdf
Hash	D641BADE28A6327C78AC2F9C9F49997A542A6EF6C3CABAF6391B46CB798200B0
MIME-Type	application/pdf

[File Properties]

File Name	OTHER_Attachment T-3 WH-1 WQ0004288000 Treatment Chemicals 2025.pdf
Hash	8F0312CDC1AEF2D9293A87A657CA1B4246093F72D91BA201A026AE7FFF683D9A
MIME-Type	application/pdf

[File Properties]

File Name	OTHER_WQ0004288000 TPDES Application Table of Contents.pdf
Hash	562A00BBF97FDD5290943E61D196B707196ECE952B568EE5B3FB3B3BF56266D6
MIME-Type	application/pdf

Certification

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

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.

1. I am Rex Lamew, the owner of the STEERS account ER065353.
2. I have the authority to sign this data on behalf of the applicant named above.
3. I have personally examined the foregoing and am familiar with its content and the content of any attachments, and based upon my personal knowledge and/or inquiry of any individual responsible for information contained herein, that this information is true, accurate, and complete.
4. I further certify that I have not violated any term in my TCEQ STEERS participation agreement and that I have no reason to believe that the confidentiality or use of my password has been compromised at any time.
5. I understand that use of my password constitutes an electronic signature legally equivalent to my written signature.
6. I also understand that the attestations of fact contained herein pertain to the implementation, oversight and enforcement of a state and/or federal environmental program and must be true and complete to the best of my knowledge.
7. I am aware that criminal penalties may be imposed for statements or omissions that I know or have reason to believe are untrue or misleading.
8. I am knowingly and intentionally signing Update Domestic or Industrial Individual Permit WQ0004288000.
9. My signature indicates that I am in agreement with the information on this form, and authorize its submittal to the TCEQ.

OWNER Signature: Rex Lamew OWNER

Customer Number:	CN604896670
Legal Name:	Wolf Hollow Services, LLC
Account Number:	ER065353
Signature IP Address:	209.36.172.18
Signature Date:	2025-04-14
Signature Hash:	09949F6FE4A26C23C25080B8B07B2C8EC08A6AA1F5AC5A552733FDC718C49E20
Form Hash Code at time of Signature:	A7DD2C0814228B841DAD112A46C9FDA53BC9D68CD58707F4AC55531872B5F811

Fee Payment

Transaction by:	The application fee payment transaction was made by ER076271/Jordan Bryan
Paid by:	The application fee was paid by JORDAN BRYAN
Fee Amount:	$2000.00
Paid Date:	The application fee was paid on 2025-04-14
Transaction/Voucher number:	The transaction number is 582EA000663692 and the voucher number is 762190

Submission

Reference Number:	The application reference number is 775329
Submitted by:	The application was submitted by ER065353/ Rex Lamew
Submitted Timestamp:	The application was submitted on 2025-04-15 at 07:12:56 CDT
Submitted From:	The application was submitted from IP address

	209.36.172.18
Confirmation Number:	The confirmation number is 646253
Steers Version:	The STEERS version is 6.89
Permit Number:	The permit number is WQ0004288000

Additional Information

Application Creator: This account was created by Dianna Kocurek

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUMMARY OF APPLICATION IN PLAIN LANGUAGE FOR TPDES OR TLAP PERMIT APPLICATIONS

Summary of Application (in plain language) Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

Applicants should use this template to develop a plain language summary of your facility and application as required by Title 30, Texas Administrative Code (30 TAC), Chapter 39, Subchapter H. You may modify the template as necessary to accurately describe your facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how you will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

If you are subject to the alternative language notice requirements in 30 TAC Section 39.426, **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS INDUSTRAIL WASTEWATER/STORMWATER

The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

Wolf Hollow Services, LLC (CN604896670) operates the Wolf Hollow I Generating Station (RN100219195), a gas fired electric generating facility, with a total generating capacity of 807 megawatts. The facility is located at 9201 Wolf Hollow Court, Granbury, Hood County, Texas 76048.

This application is for renewal of TPDES Permit No. WQ0004288000 to discharge a maximum average of 1,243,000 gallons per day of cooling tower blowdown, boiler blowdown, and low volume wastes. Cooling water is withdrawn from Lake Granbury on the Brazos River. Outfall 001 discharges downstream of the lake into the Brazos River. Treatment processes include oil/water separation.

The discharge from Outfall 001 is subject to federal effluent limitation guidelines at 40 CFR Part 423. The pollutants expected from these discharges based on the guidelines are free available and total residual chlorine, total suspended solids, oil and grease, pH, and temperature. Other potential pollutants that may be in the discharge are included in Worksheet 2 of the TPDES application.

PLANTILLA EN ESPAÑOL PARA SOLICITUDES NUEVAS/RENOVACIONES/ENMIENDAS DE TPDES o TLAP

AGUAS RESIDUALES INDUSTRIALES /AGUAS PLUVIALES

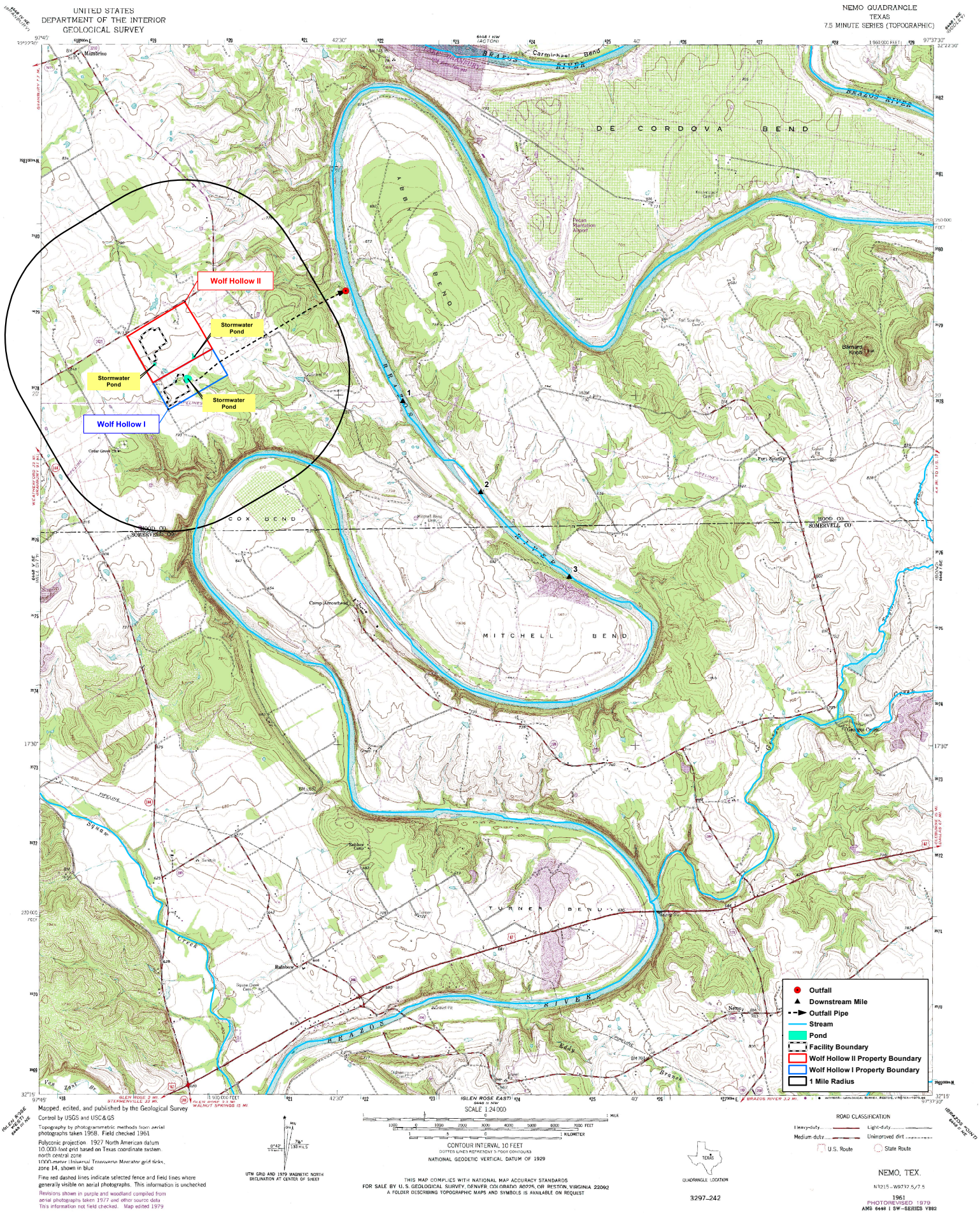
El siguiente resumen se proporciona para esta solicitud de permiso de calidad del agua pendiente que está siendo revisada por la Comisión de Calidad Ambiental de Texas según lo requerido por el Capítulo 39 del Código Administrativo de Texas 30. La información proporcionada en este resumen puede cambiar durante la revisión técnica de la solicitud y no es una representación ejecutiva fedérale de la solicitud de permiso.

Wolf Hollow Services, LLC (CN604896670) opera la estación generadora Wolf Hollow I (RN100219195), una instalación generadora de electricidad a gas, con una capacidad total de generación de 807 megavatios. La instalación está ubicada en 9201 Wolf Hollow Court, Granbury, Condado de Hood, Texas 76048.

Esta solicitud es para la renovación del permiso TPDES no. WQ0004288000 para descargar un promedio máximo de 1,243,000 galones por día de purga de la torre de refrigeración, purga de la caldera y desechos de bajo volumen. El agua de refrigeración se extrae del Lago Granbury en el río Brazos. El Outfall 001 descarga aguas abajo del lago en el río Brazos. Los procesos de tratamiento incluyen la separación de aceite/agua.

La descarga del Outfall 001 está sujeta a las directrices federales de limitación de efluentes del 40 CFR Parte 423. Los contaminantes que se esperan de estas descargas según las directrices son cloro libre disponible y residual total, sólidos suspendidos totales, aceite y grasa, pH y temperatura. Otros contaminantes potenciales que pueden estar en la descarga se incluyen en la Worksheet 2 de la solicitud TPDES.

ATTACHMENT A-1



ATTACHMENT A-1

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1958. Field checked 1961

Polyconic projection. 1927 North American datum
10,000-foot grid based on Texas coordinate system, north central zone
1000-meter Universal Transverse Mercator grid ticks,
zone 14, shown in blue

Fine red dashed lines indicate selected fence lines

There may be private inholdings within the boundaries of the National or State reservations shown on this map

Revisions shown in purple and woodland compiled from aerial photographs taken 1976 and other source data. This information not field checked. Map edited 1979

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

3297-231

ROAD CLASSIFICATION
Medium-duty — Light-duty
Unimproved dirt
State Route

HILL CITY, TEX.
N3215—W9745/7.5
1961
PHOTOREVISED 1979
AMS 6448 IV SE—SERIES V882

Attachment SPIF-1

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING DOMESTIC OR INDUSTRIAL TPDES WASTEWATER PERMIT APPLICATIONS

TCEQ USE ONLY:

Application type: _____Renewal _____Major Amendment ____Minor Amendment _____New

County: _____ Segment Number: _____

Admin Complete Date: _____

Agency Receiving SPIF:

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

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

This form applies to TPDES permit applications only. (Instructions, Page 53)

Complete this form as a separate document. TCEQ will mail a copy to each agency as required by our agreement with EPA. If any of the items are not completely addressed or further information is needed, we will contact you to provide the information before issuing the permit. Address each item completely.

Do not refer to your response to any item in the permit application form. Provide each attachment for this form separately from the Administrative Report of the application. The application will not be declared administratively complete without this SPIF form being completed in its entirety including all attachments. Questions or comments concerning this form may be directed to the Water Quality Division's Application Review and Processing Team by email at WQ-ARPTeam@tceq.texas.gov or by phone at (512) 239-4671.

The following applies to all applications:

1. Permittee: Wolf Hollow Services, LLC

   Permit No. WQ00 04288000 EPA ID No. TX 0123820

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

   9201 Wolf Hollow Court, near the City of Granbury, Hood County, Texas 76048

Attachment SPIF-1

3. 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: Rex LaMew

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

   Title: Facility Manager

   Mailing Address: 9201 Wolf Hollow Court

   City, State, Zip Code: Granbury, TX 76048

   Phone No.: 917-579-4778 Ext.: N/A Fax No.: N/A

   E-mail Address: rex.lamew@ethosenergy.com

4. List the county in which the facility is located: Hood

5. If the property is publicly owned and the owner is different than the permittee/applicant, please list the owner of the property.

   N/A

6. Provide a description of the effluent discharge route. The discharge route must follow the flow of effluent from the point of discharge to the nearest major watercourse (from the point of discharge to a classified segment as defined in 30 TAC Chapter 307). If known, please identify the classified segment number.

   Via Outfall 001 directly to the Brazos River Below Lake Granbury in Segment No. 1204 of the Brazos River Basin

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

   Attachment SPIF-1 USGS Maps

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

   N/A

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

   N/A

   - ☐ 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

Attachment SPIF-1

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

N/A

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

The site consists of electric power generation equipment, buildings/offices, parking areas, and access roads.

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

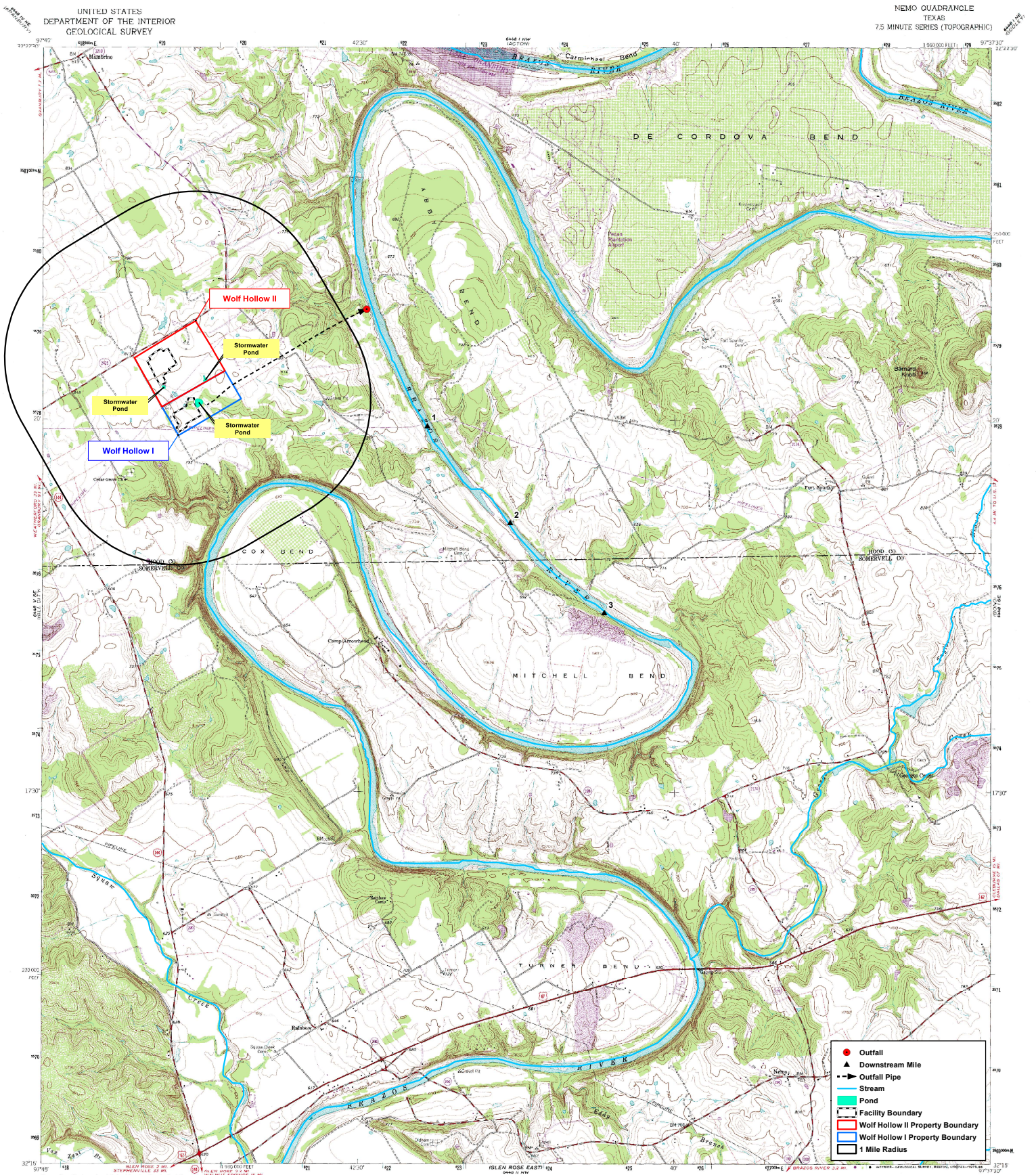
1. List construction dates of all buildings and structures on the property:

N/A

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

N/A

ATTACHMENT SPIF-2



ATTACHMENT SPIF-2

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INDUSTRIAL WASTEWATER PERMIT APPLICATION TECHNICAL REPORT 1.0

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

For **additional information** or clarification on the requested information, please refer to the Instructions for Completing the Industrial Wastewater Permit Application[1] available on the TCEQ website. Please contact the Industrial Permits Team at 512-239-4671 with any questions about this form.

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

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

Item 1. Facility/Site Information (Instructions, Page 39)

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

Wolf Hollow I, a natural gas-fired combined-cycle steam electric generating station, is located in Hood County near Granbury, Texas. Wolf Hollow I began operating in 2003 and has a nominal generating capacity of 807 gross megawatts (MW). The applicable SIC is 4911.

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

See Attachment T-1 Facility Description.

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

Materials List

Raw Materials	Intermediate Products	Final Products
Water	Steam	Electricity
Natural gas		

Attachment: N/A

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

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

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

Attachment: T-1 Facility Description, Figure 2 Facility Map

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

☐ Yes ☒ No

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

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

☒ Yes ☐ No

List source(s) used to determine 100-year frequency flood plain: FEMA Flood Maps

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

Attachment: N/A

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

☐ Yes ☐ No ☒ N/A (renewal only)

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

☐ Yes ☐ No

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

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

Item 2. Treatment System (Instructions, Page 40)

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

See Attachment T-1 Facility Description.

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

Attachment: T-1 Facility Description, Figure 1 Process Flow Diagram

Item 3. Impoundments (Instructions, Page 40)

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

☒ Yes ☐ No

If **no**, proceed to Item 4. If **yes**, complete **Item 3.a** for **existing** impoundments and **Items 3.a - 3.e** for **new or proposed** impoundments. **NOTE:** See instructions, Pages 40-42, for additional information on the attachments required by Items 3.a – 3.e.

a. Complete the table with the following information for each existing, new, or proposed impoundment. Attach additional copies of the Impoundment Information table, if needed.

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

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

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

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

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

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

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

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

Impoundment Information

Parameter	Pond #1 Retention Basin	Pond #	Pond #	Pond #
Use Designation: (T) (D) (C) or (E)	T	-	-	-
Associated Outfall Number	N/A	-	-	-
Liner Type (C) (I) (S) or (A)	S	-	-	-
Alt. Liner Attachment Reference	N/A	-	-	-
Leak Detection System, Y/N	N	-	-	-
Groundwater Monitoring Wells, Y/N	N	-	-	-
Groundwater Monitoring Data Attachment	N/A	-	-	-
Pond Bottom Located Above The Seasonal High-Water Table, Y/N	Y	-	-	-
Length (ft)	100	-	-	-
Width (ft)	30	-	-	-
Max Depth From Water Surface (ft), Not Including Freeboard	3.5	-	-	-
Freeboard (ft)	1.5	-	-	-
Surface Area (acres)	0.0295	-	-	-
Storage Capacity (gallons)	52,363	-	-	-
40 CFR Part 257, Subpart D, Y/N	N	-	-	-
Date of Construction	2021	-	-	-

Attachment: N/A

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

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

1. Liner data

☐ Yes ☐ No ☐ Not yet designed

2. Leak detection system or groundwater monitoring data

☐ Yes ☐ No ☐ Not yet designed

3. Groundwater impacts

☐ Yes ☐ No ☐ Not yet designed

NOTE: Item b.3 is required if the bottom of the pond is not above the seasonal high-water table in the shallowest water-bearing zone.

Attachment: There are no new or proposed impoundments.

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

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

Attachment: N/A

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

Attachment: N/A

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

Attachment: N/A

Item 4. Outfall/Disposal Method Information (Instructions, Page 42)

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

If there are more outfalls/points of disposal at the facility than the spaces provided, copies of pages 6 and/0r numbered accordingly (i.e., page 6a, 6b, etc.) may be used to provide information on the additional outfalls.

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

Outfall Longitude and Latitude

Outfall No.	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
001 (at discharge to Brazos River)	32.345899	-97.707332
101	32.333750	-97.730670

Outfall Location Description

Outfall No.	Location Description
001 (monitoring point)	At the sample point prior to entering the pipeline
001 (discharge point)	At the discharge to the Brazos River
101	At the outlet of the oil and water separator and prior to commingling with other wastestreams

Description of Sampling Point(s) (if different from Outfall location)

Outfall No.	Description of sampling point
001 (monitoring point)	Same as above
101	Same as above

Outfall Flow Information – Permitted and Proposed

Outfall No.	Permitted Daily Avg Flow (MGD)	Permitted Daily Max Flow (MGD)	Proposed Daily Avg Flow (MGD)	Proposed Daily Max Flow (MGD)	Anticipated Discharge Date (mm/dd/yy)
001	1.243	1.864	1.243	1.864	N/A
101	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable

Outfall Discharge – Method and Measurement

Outfall No.	Pumped Discharge? Y/N	Gravity Discharge? Y/N	Type of Flow Measurement Device Used
001	Y	N	Flow meter*
101	Y	N	Flow meter*
* Flow may be monitored using pump curves and operating time during period of meter maintenance or downtime.			

Outfall Discharge – Flow Characteristics

Outfall No.	Intermittent Discharge? Y/N	Continuous Discharge? Y/N	Seasonal Discharge? Y/N	Discharge Duration (hrs/day)	Discharge Duration (days/mo)	Discharge Duration (mo/yr)
001	N	Y	N	24	31	12
101	Y	N	N	Intermittent and flow-variable	Intermittent and flow-variable	Intermittent and flow-variable

Outfall Wastestream Contributions

Outfall No. 001

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow
Cooling tower blowdown	1.241	99.8%
Boiler blowdown and water treatment wastewaters (recirculated to cooling water system as makeup water)	N/A	N/A
Internal Outfall 101 (low volume wastes)	0.002	0.2%

Outfall No. 101

Contributing Wastestream	Volume (MGD)	Percent (%) of Total Flow
Low volume wastes	0.002	100%

Attachment: N/A

Item 5. Blowdown and Once-Through Cooling Water Discharges (Instructions, Page 43)

a. Indicate if the facility currently or proposes to:

- ☒ Yes ☐ No Use cooling towers that discharge blowdown or other wastestreams
- ☒ Yes ☐ No Use boilers that discharge blowdown or other wastestreams
- ☐ Yes ☒ No Discharge once-through cooling water

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

b. If **yes** to any of the above, attach an SDS with the following information for each chemical additive.

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

In addition to each SDS, attach a summary of the above information for each specific wastestream and the associated chemical additives. Specify which outfalls are affected.

Attachment: T-3 Treatment Chemicals and SDSs

c. Cooling Towers and Boilers

If the facility currently or proposes to use cooling towers or boilers that discharge blowdown or other wastestreams to the outfall(s), complete the following table.

Cooling Towers and Boilers

Type of Unit	Number of Units	Daily Avg Blowdown (gallons/day)	Daily Max Blowdown (gallons/day)
Cooling Towers	1	1,240,600	1,863,600
Boilers (blowdown recirculated to cooling water system as makeup water)	2	88,100	88,100

Item 6. Stormwater Management (Instructions, Page 44)

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

☐ Yes ☒ No

If **yes**, briefly describe the industrial processes and activities that occur outdoors or in a manner which may result in exposure of the activities or materials to stormwater: N/A

Item 7. Domestic Sewage, Sewage Sludge, and Septage Management and Disposal (Instructions, Page 44)

Domestic Sewage - Waste and wastewater from humans or household operations that is discharged to a wastewater collection system or otherwise enters a treatment works.

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

☐ Domestic sewage is routed (i.e., connected to or transported to) to a WWTP permitted to receive domestic sewage for treatment, disposal, or both. Complete Item 7.b.

☒ Domestic sewage disposed of by an on-site septic tank and drainfield system. Complete Item 7.b.

☐ Domestic and industrial treatment sludge ARE commingled prior to use or disposal.

☐ Industrial wastewater and domestic sewage are treated separately, and the respective sludge IS NOT commingled prior to sludge use or disposal. Complete Worksheet 5.0.

☐ Facility is a POTW. Complete Worksheet 5.0.

☐ Domestic sewage is not generated on-site.

☐ Other (e.g., portable toilets), specify and Complete Item 7.b: N/A

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

Domestic Sewage Plant/Hauler Name

Plant/Hauler Name	Permit/Registration No.
Gilbert Environmental Inc.	22634

Item 8. Improvements or Compliance/Enforcement Requirements (Instructions, Page 45)

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

☐ Yes ☒ No

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

☐ Yes ☒ No

c. If **yes** to either 8.a **or** 8.b, provide a brief summary of the requirements and a status update: N/A

Item 9. Toxicity Testing (Instructions, Page 45)

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

☒ Yes ☐ No

If **yes**, identify the tests and describe their purposes: The TPDES permit requires routine biomonitoring of Outfall 001

Additionally, attach a copy of all tests performed which **have not** been submitted to the TCEQ or EPA. **Attachment:** Biomonitoring test results are submitted to TCEQ/EPA.

Item 10. Off-Site/Third Party Wastes (Instructions, Page 45)

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

☐ Yes ☒ No

If **yes**, provide responses to Items 10.b through 10.d below.

If **no**, proceed to Item 11.

b. Attach the following information to the application:

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

Attachment: N/A

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

☐ Yes ☐ No

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

Attachment: N/A

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

☐ Yes ☐ No

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

Item 11. Radioactive Materials (Instructions, Page 46)

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

☐ Yes ☒ No

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

Radioactive Materials Mined, Used, Stored, or Processed

Radioactive Material Name	Concentration (pCi/L)
N/A	

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

☐ Yes ☒ No

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

Radioactive Materials Present in the Discharge

Radioactive Material Name	Concentration (pCi/L)
N/A	

Item 12. Cooling Water (Instructions, Page 46)

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

☒ Yes

☐ No

☐ Decommissioned: N/A

☐ To Be Decommissioned: N/A

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

If **decommissioned**, provide the date operation ceased and stop here.

If to **be decommissioned**, provide the date operation is anticipated to cease and stop here.

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

☐ Yes ☒ No

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

c. Cooling Water Supplier

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

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

CWIS ID	Wolf Hollow Intake
Owner	
Operator	

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

☒ No ☐ Yes; PWS No.: N/A

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

3. Cooling water is/will be obtained from a reclaimed water source?

☒ No ☐ Yes; Auth No.: N/A

If **no**, continue. If **yes**, provide the Reuse Authorization No. and stop here.

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

☒ No ☐ Yes; AIF: N/A

If **no**, proceed to Item 12.d. If **yes**, provide the actual intake flow of the Independent Supplier's CWIS that is/will be used to provide water for cooling purposes and proceed.

d. 316(b) General Criteria

1. The CWIS(s) used to provide water for cooling purposes to the facility has or will have a cumulative design intake flow of 2 MGD or greater.

☒ Yes ☐ No

2. At least 25% of the total water withdrawn by the CWIS(s) is/will be used at the facility exclusively for cooling purposes on an annual average basis.

   ☒ Yes ☐ No

3. The CWIS(s) withdraw(s)/propose(s) to withdraw water for cooling purposes from surface waters that meet the definition of Waters of the United States in *40 CFR § 122.2*.

   ☒ Yes ☐ No. Explanation: N/A

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

If **yes** to all three questions in Item 12.d, the facility **meets** the minimum criteria to be subject to the full requirements of Section 316(b) of the CWA. Proceed to **Item 12.f**.

If **no** to any of the questions in Item 12.d, the facility **does not meet** the minimum criteria to be subject to the full requirements of Section 316(b) of the CWA; however, a determination is required based upon BPJ. Proceed to **Item 12.e**.

e. The facility does not meet the minimum requirements to be subject to the fill requirements of Section 316(b) **and uses**/proposes **to use cooling towers**.

   ☐ Yes ☐ No

   If **yes**, stop here. If **no**, complete Worksheet 11.0, Items 1.a, 1.b.1-3 and 6, 2.b.1, and 3.a to allow for a determination based upon BPJ.

f. Oil and Gas Exploration and Production

   1. The facility is subject to requirements at 40 CFR Part 435, Subparts A or D.

      ☐ Yes ☒ No

      If **yes**, continue. If **no**, skip to Item 12.g.

   2. The facility is an existing facility as defined at 40 CFR § 125.92(k) or a new unit at an existing facility as defined at 40 CFR § 125.92(u).

      ☐ Yes ☐ No

      If **yes**, complete Worksheet 11.0, Items 1.a, 1.b.1-3 and 6, 2.b.1, and 3.a to allow for a determination based upon BPJ. If **no**, skip to Item 12.g.3.

g. Compliance Phase and Track Selection

   1. Phase I – New facility subject to 40 CFR Part 125, Subpart I

      ☐ Yes ☒ No

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

      ☐ Track I – AIF greater than 2 MGD, but less than 10 MGD

      - Attach information required by *40 CFR §§ 125.86(b)(2)-(4)*.

      ☐ Track I – AIF greater than 10 MGD

      - Attach information required by *40 CFR § 125.86(b)*.

☐ Track II

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

Attachment: N/A

2. Phase II – Existing facility subject to 40 CFR Part 125, Subpart J

   ☒ Yes ☐ No

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

3. Phase III – New facility subject to 40 CFR Part 125, Subpart N

   ☐ Yes ☒ No

   If **yes**, check the box next to the compliance track selection and provide the requested information.

   ☐ Track I – Fixed facility

   - Attach information required by 40 CFR § 125.136(b) and complete Worksheet 11.0, Items 2 and 3, and Worksheet 11.2.

   ☐ Track I – Not a fixed facility

   - Attach information required by 40 CFR § 125.136(b) and complete Worksheet 11.0, Item 2 (except CWIS latitude/longitude under Item 2.a).

   ☐ Track II – Fixed facility

   - Attach information required by 40 CFR § 125.136(c) and complete Worksheet 11.0, Items 2 and 3.

   Attachment: N/A

Item 13. Permit Change Requests (Instructions, Page 48)

This item is only applicable to existing permitted facilities.

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

☐ Yes ☒ No

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

N/A

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

☒ Yes ☐ No

If **yes**, list and describe each change individually.

Remove items related to Interim Phase because the facility is now operating in Final Phase of the TPDES permit.

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

☐ Yes ☒ No

If **yes**, list and describe each change individually.

N/A

Item 14. Laboratory Accreditation (Instructions, Page 49)

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: Rex LaMew

Title: Facility Manager

Signature/Date: Submitted via TCEQ online application.

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 1.0: EPA CATEGORICAL EFFLUENT GUIDELINES

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

Item 1. Categorical Industries (Instructions, Page 53)

Is this facility subject to any 40 CFR categorical ELGs outlined on page 53 of the instructions?

☒ Yes ☐ No

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

40 CFR Effluent Guideline

Industry	40 CFR Part
Steam Electric Power Generating	423

Item 2. Production/Process Data (Instructions, Page 54)

NOTE: For all TPDES permit applications requesting individual permit coverage for discharges of oil and gas exploration and production wastewater (discharges into or adjacent to water in the state, falling under the Oil and Gas Extraction Effluent Guidelines – 40 CFR Part 435), see Worksheet 12.0, Item 2 instead.

a. Production Data

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

Production Data

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

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

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

Percentage of Total Production

Subcategory	Percent of Total Production	Appendix A and B - Metals	Appendix A - Cyanide
N/A			

c. Refineries (40 CFR Part 419)

Provide the applicable subcategory and a brief justification.

N/A

Item 3. Process/Non-Process Wastewater Flows (Instructions, Page 54)

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

See Attachment T-1 Facility Description, Table 1 Wastewater Flows by Outfall.

Item 4. New Source Determination (Instructions, Page 54)

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

Wastewater Generating Processes Subject to Effluent Guidelines

Process	EPA Guideline Part	EPA Guideline Subpart	Date Process/ Construction Commenced
Cooling tower blowdown	423	N/A	8/2003
Low volume wastewater	423	N/A	8/2003

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 2.0: POLLUTANT ANALYSIS

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

Item 1. General Testing Requirements (Instructions, Page 55)

a. Provide the date range of all sampling events conducted to obtain the analytical data submitted with this application (e.g., 05/01/2018-05/30/2018): 02/21/2025

Note: Data for only one sampling event are included here due to a scheduled facility outage. The additional three sample events are in preparation and results will be submitted as soon as available.

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

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

Contract Laboratories for Outfall Analyses	
Parameters	**Laboratory**
Biochemical oxygen demand (BOD), carbonaceous BOD, oil and grease, total dissolved solids, total suspended solids, temperature/pH (field tests)	Eurofins Dallas 9701 Harry Hines Blvd. Dallas, TX 75220 Accreditation ID: T104704295
Bisphenol A, nonylphenol	Eurofins Denver 4955 Yarrow St. Arvada, CO 80002 Accreditation ID: T104704183
Color	Eurofins Orlando 481 Newburyport Ave. Altamonte Springs, FL Accreditation ID: T104704571
Cyanide	Eurofins Pittsburgh 301 Alpha Drive, RIDC Park Pittsburgh, PA 15238 Accreditation ID: T104704528
Mercury	Eurofins Arkansas 8600 Kanis Rd. Little Rock, AR 72204 Accreditation ID: T104704575
All other analytes	Eurofins Houston 4145 Greenbriar Dr. Stafford, TX 77477 Accreditation ID: T104704215

Item 2. Specific Testing Requirements (Instructions, Page 56)

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

TABLE 1 and TABLE 2 (Instructions, Page 58)

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

Table 1 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)
	2/21/25			
BOD (5-day)	<2.4			
CBOD (5-day)	<2.4			
Chemical oxygen demand	65.			
Total organic carbon	20.3			
Dissolved oxygen	-			
Ammonia nitrogen	<0.1			
Total suspended solids	11.4			
Nitrate nitrogen	1.63			
Total organic nitrogen	3.17			
Total phosphorus	1.48			
Oil and grease	<5.97			
Total residual chlorine	-			
Total dissolved solids	5870.			
Sulfate	1360.			
Chloride	2360.			
Fluoride	0.715			
Total alkalinity (mg/L as CaCO3)	109.			
Temperature (°F)	55.3			
pH (standard units)	7.77			

Table 2 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
	2/21/25				
Aluminum, total	108.				2.5
Antimony, total	7.25				5
Arsenic, total	6.26				0.5
Barium, total	626.				3
Beryllium, total	<0.375				0.5
Cadmium, total	<0.258				1
Chromium, total	1.94				3
Chromium, hexavalent	<2.8				3
Chromium, trivalent	<2.				N/A
Copper, total	15.7				2
Cyanide, available	1.64				2/10
Lead, total	<0.369				0.5
Mercury, total	<0.0005				0.005/0.0005

Pollutant	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	MAL (µg/L)
Nickel, total	7.26				2
Selenium, total	3.18				5
Silver, total	<0.351				0.5
Thallium, total	<0.215				0.5
Zinc, total	7.71				5.0

TABLE 3 (Instructions, Page 58)

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

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

Table 3 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
	2/21/25				
Acrylonitrile	<50.				50
Anthracene	<0.564				10
Benzene	<1.				10
Benzidine	<1.13				50
Benzo(a)anthracene	<0.113				5
Benzo(a)pyrene	<0.113				5
Bis(2-chloroethyl)ether	<0.564				10
Bis(2-ethylhexyl)phthalate	<2.82				10
Bromodichloromethane [Dichlorobromomethane]	<1.				10
Bromoform	<5.				10
Carbon tetrachloride	<5.				2
Chlorobenzene	<1.				10
Chlorodibromomethane [Dibromochloromethane]	<5.				10
Chloroform	<1.				10
Chrysene	<0.564				5
m-Cresol [3-Methylphenol]	<0.564				10
o-Cresol [2-Methylphenol]	<0.564				10
p-Cresol [4-Methylphenol]	<0.564				10
1,2-Dibromoethane	<5.				10
m-Dichlorobenzene [1,3-Dichlorobenzene]	<0.564				10
o-Dichlorobenzene [1,2-Dichlorobenzene]	<0.564				10
p-Dichlorobenzene [1,4-Dichlorobenzene]	<0.564				10
3,3'-Dichlorobenzidine	<0.564				5
1,2-Dichloroethane	<1.				10
1,1-Dichloroethene [1,1-Dichloroethylene]	<1.				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)*
Dichloromethane [Methylene chloride]	<5.				20
1,2-Dichloropropane	<5.				10
1,3-Dichloropropene [1,3-Dichloropropylene]	<5.				10
2,4-Dimethylphenol	<0.564				10
Di-n-Butyl phthalate	<2.82				10
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	<50.				---
Ethylbenzene	<1.				10
Ethylene Glycol	<5000.				---
Fluoride	715.				500
Hexachlorobenzene	<0.564				5
Hexachlorobutadiene	<0.564				10
Hexachlorocyclopentadiene	<0.564				10
Hexachloroethane	<0.564				20
4,4'-Isopropylidenediphenol (bisphenol A)	1.09				1
Methyl ethyl ketone	<50.				50
Methyl tert-butyl ether (MTBE)	<50.				---
Nitrobenzene	0.149				10
N-Nitrosodiethylamine	<1.13				20
N-Nitroso-di-n-butylamine	<1.13				20
Nonylphenol	<5.01				333
Pentachlorobenzene	<0.564				20
Pentachlorophenol	<1.13				5
Phenanthrene	<0.564				10
Polychlorinated biphenyls (PCBs) (**)	<0.0628				0.2
Pyridine	<2.82				20
1,2,4,5-Tetrachlorobenzene	<0.564				20
1,1,2,2-Tetrachloroethane	<1.				10
Tetrachloroethene [Tetrachloroethylene]	<1.				10
Toluene	<1.				10
1,1,1-Trichloroethane	<5.				10
1,1,2-Trichloroethane	<1.				10
Trichloroethene [Trichloroethylene]	<5.				10
2,4,5-Trichlorophenol	<0.564				50
TTHM (Total trihalomethanes)	<5.				10
Vinyl chloride	<2.				10

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

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

TABLE 4 (Instructions, Pages 58-59)

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

a. **Tributyltin**

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

☐ Yes ☒ No

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

☐ Manufacturers and formulators of tributyltin or related compounds.

☐ Painting of ships, boats and marine structures.

☐ Ship and boat building and repairing.

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

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

☐ Facilities engaged in wood preserving.

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

b. **Enterococci (discharge to saltwater)**

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

☐ Yes ☒ No

Domestic wastewater is/will be discharged.

☐ Yes ☒ No

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

c. E. coli (discharge to freshwater)

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

☐ Yes ☒ No

Domestic wastewater is/will be discharged.

☐ Yes ☒ No

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

Table 4 for Outfall No.: N/A **Samples are (check one): ☐ Composite ☐ Grab**

Pollutant	Sample 1	Sample 2	Sample 3	Sample 4	MAL
Tributyltin (µg/L)					0.010
Enterococci (cfu or MPN/100 mL)					N/A
E. coli (cfu or MPN/100 mL)					N/A

TABLE 5 (Instructions, Page 59)

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

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

☒ N/A

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

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

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

* Indicate units if different from µg/L.

TABLE 6 (Instructions, Page 59)

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

Table 6 for Outfall No.: 001 **Samples are (check one):** ☐ **Composite** ☒ **Grab**

Pollutants	Believed Present	Believed Absent	Sample 1 (mg/L)	Sample 2 (mg/L)	Sample 3 (mg/L)	Sample 4 (mg/L)	MAL (µg/L)*
			21-Feb-25				
Bromide	☐	☒	<0.5				400
Color (PCU)	☒	☐	20.				—
Nitrate-Nitrite (as N)	☒	☐	1.63				—
Sulfide (as S)	☐	☒	<0.1				—
Sulfite (as SO3)	☒	☐	-				—
Surfactants	☒	☐	0.108				—
Boron, total	☒	☐	0.869				20
Cobalt, total	☒	☐	0.000767				0.3
Iron, total	☒	☐	0.267				7
Magnesium, total	☒	☐	118.				20
Manganese, total	☒	☐	0.358				0.5
Molybdenum, total	☒	☐	0.00997				1
Tin, total	☐	☒	<0.002				5
Titanium, total	☒	☐	0.00149				30

TABLE 7 (Instructions, Page 60)

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

☐ N/A

Table 7 for Applicable Industrial Categories

Industrial Category	40 CFR Part	Volatiles Table 8	Acids Table 9	Bases/ Neutrals Table 10	Pesticides Table 11
☐ Adhesives and Sealants		☐ Yes	☐ Yes	☐ Yes	No
☐ Aluminum Forming	467	☐ Yes	☐ Yes	☐ Yes	No
☐ Auto and Other Laundries		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Battery Manufacturing	461	☐ Yes	No	☐ Yes	No
☐ Coal Mining	434	No	No	No	No
☐ Coil Coating	465	☐ Yes	☐ Yes	☐ Yes	No
☐ Copper Forming	468	☐ Yes	☐ Yes	☐ Yes	No
☐ Electric and Electronic Components	469	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Electroplating	413	☐ Yes	☐ Yes	☐ Yes	No
☐ Explosives Manufacturing	457	No	☐ Yes	☐ Yes	No
☐ Foundries		☐ Yes	☐ Yes	☐ Yes	No
☐ Gum and Wood Chemicals - Subparts A,B,C,E	454	☐ Yes	☐ Yes	No	No
☐ Gum and Wood Chemicals - Subparts D,F	454	☐ Yes	☐ Yes	☐ Yes	No
☐ Inorganic Chemicals Manufacturing	415	☐ Yes	☐ Yes	☐ Yes	No
☐ Iron and Steel Manufacturing	420	☐ Yes	☐ Yes	☐ Yes	No
☐ Leather Tanning and Finishing	425	☐ Yes	☐ Yes	☐ Yes	No
☐ Mechanical Products Manufacturing		☐ Yes	☐ Yes	☐ Yes	No
☐ Nonferrous Metals Manufacturing	421,471	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Oil and Gas Extraction - Subparts A, D, E, F, G, H	435	☐ Yes	☐ Yes	☐ Yes	No
☐ Ore Mining - Subpart B	440	No	☐ Yes	No	No
☐ Organic Chemicals Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Paint and Ink Formulation	446,447	☐ Yes	☐ Yes	☐ Yes	No
☐ Pesticides	455	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Petroleum Refining	419	☐ Yes	No	No	No
☐ Pharmaceutical Preparations	439	☐ Yes	☐ Yes	☐ Yes	No
☐ Photographic Equipment and Supplies	459	☐ Yes	☐ Yes	☐ Yes	No
☐ Plastic and Synthetic Materials Manufacturing	414	☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Plastic Processing	463	☐ Yes	No	No	No
☐ Porcelain Enameling	466	No	No	No	No
☐ Printing and Publishing		☐ Yes	☐ Yes	☐ Yes	☐ Yes
☐ Pulp and Paperboard Mills - Subpart C	430	☐ *	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subparts F, K	430	☐ *	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts A, B, D, G, H	430	☐ Yes	☐ Yes	☐ *	☐ *
☐ Pulp and Paperboard Mills - Subparts I, J, L	430	☐ Yes	☐ Yes	☐ *	☐ Yes
☐ Pulp and Paperboard Mills - Subpart E	430	☐ Yes	☐ Yes	☐ Yes	☐ *
☐ Rubber Processing	428	☐ Yes	☐ Yes	☐ Yes	No
☐ Soap and Detergent Manufacturing	417	☐ Yes	☐ Yes	☐ Yes	No
☒ Steam Electric Power Plants	423	☒ Yes	☒ Yes	No	No
☐ Textile Mills (Not Subpart C)	410	☐ Yes	☐ Yes	☐ Yes	No
☐ Timber Products Processing	429	☐ Yes	☐ Yes	☐ Yes	☐ Yes

* Test if believed present.

TABLES 8, 9, 10, and 11 (Instructions, Page 60)

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

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

Table 8 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
	21-Feb-25				
Acrolein	<50.				50
Acrylonitrile	<50.				50
Benzene	<1.				10
Bromoform	<5.				10
Carbon tetrachloride	<5.				2
Chlorobenzene	<1.				10
Chlorodibromomethane	<5.				10
Chloroethane	<10.				50
2-Chloroethylvinyl ether	<5.				10
Chloroform	<1.				10
Dichlorobromomethane [Bromodichloromethane]	<1.				10
1,1-Dichloroethane	<1.				10
1,2-Dichloroethane	<1.				10
1,1-Dichloroethylene [1,1-Dichloroethene]	<1.				10
1,2-Dichloropropane	<5.				10
1,3-Dichloropropylene [1,3-Dichloropropene]	<5.				10
Ethylbenzene	<1.				10
Methyl bromide [Bromomethane]	<5.				50
Methyl chloride [Chloromethane]	<10.				50
Methylene chloride [Dichloromethane]	<5.				20
1,1,2,2-Tetrachloroethane	<1.				10
Tetrachloroethylene [Tetrachloroethene]	<1.				10
Toluene	<1.				10
1,2-Trans-dichloroethylene [1,2-Trans-dichloroethene]	<1.				10
1,1,1-Trichloroethane	<5.				10
1,1,2-Trichloroethane	<1.				10
Trichloroethylene [Trichloroethene]	<5.				10
Vinyl chloride	<2.				10

* Indicate units if different from µg/L.

Table 9 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
	21-Feb-25				
2-Chlorophenol	<0.564				10
2,4-Dichlorophenol	<0.564				10
2,4-Dimethylphenol	<0.564				10
4,6-Dinitro-o-cresol	<1.13				50
2,4-Dinitrophenol	<5.64				50
2-Nitrophenol	0.368				20
4-Nitrophenol	<0.564				50
p-Chloro-m-cresol	<0.564				10
Pentachlorophenol	<1.13				5
Phenol	<1.13				10
2,4,6-Trichlorophenol	<0.564				10

* Indicate units if different from µg/L.

Table 10 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
	21-Feb-25				
Acenaphthene	<0.564				10
Acenaphthylene	<0.564				10
Anthracene	<0.564				10
Benzidine	<1.13				50
Benzo(a)anthracene	<0.113				5
Benzo(a)pyrene	<0.113				5
3,4-Benzofluoranthene [Benzo(b)fluoranthene]	<0.564				10
Benzo(ghi)perylene	<0.564				20
Benzo(k)fluoranthene	<0.564				5
Bis(2-chloroethoxy)methane	<0.564				10
Bis(2-chloroethyl)ether	<0.564				10
Bis(2-chloroisopropyl)ether	<0.564				10
Bis(2-ethylhexyl)phthalate	<2.82				10
4-Bromophenyl phenyl ether	<0.564				10
Butylbenzyl phthalate	<2.82				10
2-Chloronaphthalene	<0.564				10
4-Chlorophenyl phenyl ether	<0.564				10
Chrysene	<0.564				5
Dibenzo(a,h)anthracene	<0.113				5
1,2-Dichlorobenzene [o-Dichlorobenzene]	<0.564				10
1,3-Dichlorobenzene [m-Dichlorobenzene]	<0.564				10
1,4-Dichlorobenzene [p-Dichlorobenzene]	<0.564				10
3,3'-Dichlorobenzidine	<0.564				5
Diethyl phthalate	<2.82				10
Dimethyl phthalate	<2.82				10

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
Di-n-butyl phthalate	<2.82				10
2,4-Dinitrotoluene	<0.564				10
2,6-Dinitrotoluene	<0.564				10
Di-n-octyl phthalate	<2.82				10
1,2-Diphenylhydrazine (as Azobenzene)	<0.564				20
Fluoranthene	<0.564				10
Fluorene	<0.564				10
Hexachlorobenzene	<0.564				5
Hexachlorobutadiene	<0.564				10
Hexachlorocyclopentadiene	<0.564				10
Hexachloroethane	<0.564				20
Indeno(1,2,3-cd)pyrene	<0.564				5
Isophorone	<0.564				10
Naphthalene	<0.564				10
Nitrobenzene	0.149				10
N-Nitrosodimethylamine	<0.564				50
N-Nitrosodi-n-propylamine	<0.564				20
N-Nitrosodiphenylamine	<0.564				20
Phenanthrene	<0.564				10
Pyrene	<0.564				10
1,2,4-Trichlorobenzene	<0.564				10

* Indicate units if different from µg/L.

Table 11 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
	21-Feb-25				
Aldrin	-				0.01
alpha-BHC [alpha-Hexachlorocyclohexane]	-				0.05
beta-BHC [beta-Hexachlorocyclohexane]	-				0.05
gamma-BHC [gamma-Hexachlorocyclohexane]	-				0.05
delta-BHC [delta-Hexachlorocyclohexane]	-				0.05
Chlordane	-				0.2
4,4'-DDT	-				0.02
4,4'-DDE	-				0.1
4,4'-DDD	-				0.1
Dieldrin	-				0.02
Endosulfan I (alpha)	-				0.01
Endosulfan II (beta)	-				0.02
Endosulfan sulfate	-				0.1
Endrin	-				0.02
Endrin aldehyde	-				0.1
Heptachlor	-				0.01
Heptachlor epoxide	-				0.01

Pollutant	Sample 1 (µg/L)*	Sample 2 (µg/L)*	Sample 3 (µg/L)*	Sample 4 (µg/L)*	MAL (µg/L)
PCB 1242	<0.05				0.2
PCB 1254	<0.0628				0.2
PCB 1221	<0.05				0.2
PCB 1232	<0.05				0.2
PCB 1248	<0.05				0.2
PCB 1260	<0.0628				0.2
PCB 1016	<0.05				0.2
Toxaphene	-				0.3

* Indicate units if different from µg/L.

Attachment: N/A

TABLE 12 (DIOXINS/FURAN COMPOUNDS)

Complete of Table 12 **is required** for **external outfalls**, as directed below. (Instructions, Pages 59-60)

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

☐ 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) CASRN 93-76-5

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

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

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

☐ 2,4,5-trichlorophenol (TCP) CASRN 95-95-4

☐ hexachlorophene (HCP) CASRN 70-30-4

☒ None of the above

Description: N/A

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

☐ Yes ☒ No

Description: N/A

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

Table 12 for Outfall No.: N/A **Samples are (check one):** ☐ **Composite** ☐ **Grab**

Compound	Toxicity Equivalent Factors	Wastewater Concentration (ppq)	Wastewater Toxicity Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Toxicity Equivalents (ppt)	MAL (ppq)
2,3,7,8-TCDD	1					10
1,2,3,7,8-PeCDD	1.0					50

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

TABLE 13 (HAZARDOUS SUBSTANCES)

Complete Table 13 **is required** for all **external outfalls** as directed below. (Instructions, Pages 60-61)

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

☒ Yes ☐ No

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

☐ Yes ☒ No

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

Table 13 for Outfall No.: 001 **Samples are (check one): ☐ Composite ☒ Grab**

Pollutant	CASRN	Sample 1 (µg/L)	Sample 2 (µg/L)	Sample 3 (µg/L)	Sample 4 (µg/L)	Analytical Method
		2/21/25				
Vanadium, total	7440-62-2	6.85				200.8

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 4.0: RECEIVING WATERS

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

Item 1. Domestic Drinking Water Supply (Instructions, Page 80)

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

☐ Yes ☒ No

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

1. The legal name of the owner of the drinking water supply intake: N/A
2. The distance and direction from the outfall to the drinking water supply intake: N/A

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

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

Item 2. Discharge Into Tidally Influenced Waters (Instructions, Page 80)

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

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

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

☐ Yes ☐ No

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

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

☐ Yes ☐ No

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

Item 3. Classified Segment (Instructions, Page 80)

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

☒ Yes ☐ No

If **yes**, stop here and do not complete Items 4 and 5 of this worksheet or Worksheet 4.1.

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

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 11.0: COOLING WATER SYSTEM INFORMATION

This worksheet **is required** for all TPDES permit applications **that meet the conditions outlined in Technical Report 1.0, Item 12.**

Item 1. Cooling Water System Data (Instructions, Page 104)

a. Complete the following table with information regarding the cooling water system.

Cooling Water System Data

Parameter	Volume (include units)
Total DIF	9.9 MGD
Total AIF	1.727 MGD (Jan 2020 - Dec 2024)
Intake Flow Use(s) (%)	
Contact cooling	Wolf Hollow I: 0%
Non-contact cooling	Wolf Hollow I: 93.2%
Process Wastewater	Wolf Hollow I: 6.8%
Other	Wolf Hollow I: 0%

b. Attach the following information:

1. A narrative description of the design and annual operation of the facility's cooling water system and its relationship to the CWIS(s).

2. A scaled map depicting the location of each CWIS, impoundment, intake pipe, and canals, pipes, or waterways used to convey cooling water to, or within, the cooling water system. Provide the latitude and longitude for each CWIS and any intake pipe(s) on the map. Indicate the position of the intake pipe within the water column.

3. A description of water reuse activities, if applicable, reductions in total water withdrawals, if applicable, and the proportion of the source waterbody withdrawn (on a monthly basis).

4. Design and engineering calculations prepared by a qualified professional and data to support the information provided in above item a.

5. Previous year (a minimum of 12 months) of AIF data.

6. A narrative description of existing or proposed impingement and entrainment technologies or operation measures and a summary of their performance, including, but not limited to, reductions in impingement mortality and entrainment due to intake location and reductions in total water withdrawals and usage.

Attachment: T-2 Cooling Water System

Item 2. Cooling Water Intake Structure(s) Data (Instructions, Page 105)

a. Complete the following table with information regarding each cooling water intake structure (this includes primary and make-up CWIS(s)).

Cooling Water Intake Structure(s) Data

CWIS ID	Wolf Hollow Intake
DIF (include units)	9.9 MGD
AIF (include units)	1.727 MGD (Jan 2020 - Dec 2024)
Intake Flow Use(s) (%)	
Contact cooling	Wolf Hollow I: 0%
Non-contact cooling	Wolf Hollow I: 93.2%
Process Wastewater	Wolf Hollow I: 6.8%
Other	Wolf Hollow I: 0%
Latitude (decimal degrees)	32.378045 (at intake vault)
Longitude (decimal degrees)	-97.708896 (at intake vault)

b. Attach the following information regarding the CWIS(s):

1. A narrative description of the configuration of each CWIS, annual and daily operation, including any seasonal changes, and where it is located in the water body and in the water column.

2. Engineering calculations for each CWIS.

Attachment: T-2 Cooling Water System

Item 3. Source Water Physical Data (Instructions, Page 105)

a. Complete the following table with information regarding the CWIS(s) source waterbody (this includes primary and make-up CWIS(s)).

Source Waterbody Data

CWIS ID	Wolf Hollow Intake
Source Waterbody	Lake Granbury
Mean Annual Flow	Water discharge from Lake Granbury is controlled-release. The mean annual flow of the Brazos River approximately 40 miles upstream of Lake Granbury's De Cordova Bend Dam is 563 cfs (USGS Station 080908000 Brazos River near Dennis, TX, water year 2024).
Source	

b. Attach the following information regarding the source waterbody.

1. A narrative description of the source water for each CWIS, including areal dimensions, depths, salinity and temperature regimes, and other documentation that supports this determination of the water body type where each cooling water intake structure is located.

2. A narrative description of the source waterbody's hydrological and geomorphological features.

3. Scaled drawings showing the physical configuration of all source water bodies used by the facility, including the source waterbody's hydrological and geomorphological features. **NOTE:** The source waterbody's hydrological and geomorphological features may be included on the map submitted for item 1.b.ii of this worksheet.

4. A description of the methods used to conduct any physical studies to determine the intake's area of influence within the waterbody and the results of such studies.

Attachment: T-2 Cooling Water System

Item 4. Operational Status (Instructions, Page 106)

a. Is this application for a power production or steam generation facility?

☒ Yes ☐ No

If **no**, proceed to Item 4.b. If **yes**, provide the following information as an attachment:

1. Describe the operating status of each individual unit, including age, capacity utilization rate (or equivalent) for the previous five years (a minimum of 60 months), and any seasonal changes in operation.

2. Describe any extended or unusual outages or other factors which significantly affect current data for flow, impingement, entrainment.

3. Identify any operating unit with a capacity utilization rate of less than 8 percent averaged over a contiguous period of two years (a minimum of 24 months).

4. Describe any major upgrades completed within the last 15 years, including but not limited to boiler replacement, condenser replacement, turbine replacement, or changes of fuel type.

Attachment: T-2 Cooling Water System

b. Process Units

1. Is this application for a facility which has process units that use cooling water (other than for power production or steam generation)?

☐ Yes ☒ No

If **no**, proceed to Item 4.c. If **yes**, continue.

2. Does the facility use or intend to use reductions in flow or changes in operations to meet the requirements of *40 CFR § 125.94(c)*?

☐ Yes ☐ No

If **no**, proceed to Item 4.c. If **yes**, attach descriptions of the following information:

- Individual production processes and product lines
- The operating status, including age of each line and seasonal operation
- Any extended or unusual outages that significantly affect current data for flow, impingement, entrainment, or other factors
- Any major upgrades completed within the last 15 years and plans or schedules for decommissioning or replacement of process units or production processes and product lines.

Attachment: N/A

c. Is this an application for a nuclear power production facility?

☐ Yes ☒ No

If **no**, proceed to Item 4.d. If **yes**, attach a description of completed, approved, or scheduled upgrades and the Nuclear Regulatory Commission relicensing status for each unit at the facility.

Attachment: N/A

d. Is this an application for a manufacturing facility?

☐ Yes ☒ No

If **no**, proceed to Worksheet 11.1. If **yes**, attach descriptions of current and future production schedules and any plans or schedules for any new units planned within the next five years (a minimum of 60 mos)

Attachment: N/A

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 11.1: IMPINGEMENT MORTALITY

This worksheet **is required** for all TPDES permit applications **that meet the conditions outlined in Technical Report 1.0, Item 12.** Complete one copy of this worksheet for **each** individual CWIS the facility uses or proposes to use.

CWIS ID: Wolf Hollow Intake

Item 1. Impingement Compliance Technology Selection (Instructions, Page 107)

Check the box next to the method of compliance for the Impingement Mortality Standard selected by the facility.

☐ Closed-cycle recirculating system(CCRS) [*40 CFR § 125.94(c)(1)*]

☒ 0.5 ft/s Through-Screen Design Velocity [*40 CFR § 125.94(c)(2)*] – Proceed to Worksheet 11.2

Note: Wolf Hollow I also operates with a closed-cycle recirculating system (CCRS) that meets the requirements of 125.94(c)(1).

☐ 0.5 ft/s Through Screen Actual Velocity [*40 CFR § 125.94(c)(3)*]

☐ Existing offshore velocity cap [*40 CFR § 125.94(c)(4)*] – Proceed to Worksheet 11.2

☐ Modified traveling screens [*40 CFR § 125.94(c)(5)*]

☐ System of technologies [*40 CFR § 125.94(c)(6)*]

☐ Impingement mortality performance standard [*40 CFR § 125.94(c)(7)*]

☐ De minimis rate of impingement [*40 CFR § 125.94(c)(11)*]

☐ Low capacity utilization power-generation facilities [*40 CFR § 125.94(c)(12)*]

If 0.5 ft/s Through-Screen Design Velocity [*40 CFR § 125.94(c)(2)*] or existing offshore velocity cap [*40 CFR § 125.94(c)(4)*] was selected, proceed to Worksheet 11.2. Otherwise, continue to Item 2.

Item 2. Impingement Compliance Technology Information (Instructions, Page 107)

Complete the following sections based on the selection made for item 1 above.

a. CCRS [*40 CFR § 125.94(c)(1)*]

☐ Check this box to confirm the CWS meets the definition of CCRS located at *40 CFR § 125.91(c)* and provide a response to the following questions.

1. Does the facility use or propose to use a CWIS to replenish water losses to the CWS?

☐ Yes ☐ No

If **no**, proceed to item a.2. If **yes**, provide the following information as an attachment and continue.

- CWIS ID

- 12 months of intake flow data for any CWIS used for make-up intake flows to replenish cooling water losses, excluding intakes for losses due to blowdown, drift, or evaporation.
- A narrative description of any physical or operational measures taken to minimize make-up withdraws.

Attachment: N/A

NOTE: Do not complete a separate Worksheet 11.1 for a make-up CWIS.

2. Does the facility use or propose to use cooling towers?

☐ Yes ☐ No

If **no**, proceed to Worksheet 11.2. If **yes**, provide the following information and proceed to Worksheet 11.2.

- Average number of cycles of concentration (COCs) prior to blowdown:

Average COCs Prior to Blowdown

Cooling Tower ID				
COCs				

- Attach COC monitoring data for each cooling tower from the previous year (a minimum of 12 months): N/A
- Maximum number of COCs each cooling tower can accomplish based on design of the system.

Calculated COCs Prior to Blowdown

Cooling Tower ID				
COCs				

- Describe conditions that may limit the number of COCs prior to blowdown, if any, including but not limited to permit conditions: N/A

b. 0.5 ft/s Through Screen Actual Velocity [*40 CFR § 125.94(c)(3)*]

Provide daily intake flow measurement monitoring data from the previous year (a minimum of 12 months) as an attachment and proceed to Worksheet 11.2.

Attachment: N/A

c. Modified traveling screens [*40 CFR § 125.94(c)(5)*]

Provide the following information as an attachment and proceed to Worksheet 11.2.

1. A description of the modified traveling screens and associated equipment.
2. A site-specific impingement technology performance optimization study that includes a narrative description of the biological data collection methods
3. Biological sampling data from the previous two years (a minimum of 24 months).

Attachment: N/A

d. System of technologies [*40 CFR § 125.94(c)(6)*] or impingement mortality performance standard [*40 CFR § 125.94(c)(7)]*

Provide the following information as an attachment and proceed to Worksheet 11.2.

1. A description of the system of technologies used or proposed for use by the facility to achieve compliance with the impingement mortality standard.

2. A site-specific impingement technology performance optimization study that includes a narrative description of the biological data collection methods.

3. Biological sampling data from the previous two years (a minimum of 24 months).

Attachment: N/A

e. De minimis rate of impingement [*40 CFR § 125.94(c)(11)*]

Provide the following information and proceed to Worksheet 11.2.

1. Attach monitoring data from the previous year (a minimum of 12 months) of intake flow measured at a frequency of 1/day on days of operation.

   Attachment: N/A

2. If the rate of impingement caused by the CWIS is extremely low (at an organism or age-one equivalent count), attach supplemental information to Worksheet 11.0, item 1.b.6. to support this determination.

   Attachment: N/A

f. Low capacity utilization power-generation facilities [*40 CFR § 125.94(c)(12)*]

Attach monthly utilization data from the previous 2 years (a minimum of 24 months) for each operating unit and proceed to Worksheet 11.2.

Attachment: N/A

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 11.2: SOURCE WATER BIOLOGICAL DATA

This worksheet **is required** for all TPDES permit applications that **meet the conditions outlined in Technical Report 1.0, Item 12**. Complete one copy of this worksheet for **each** source waterbody of a CWIS for which a facility has selected an Impingement Mortality Technology Option described at *40 CFR §§ 125.94(c)(1)-(7)*.

Name of source waterbody: Lake Granbury

Item 1. Species Management (Instructions, Page 109)

a. The facility has obtained an incidental take permit for its cooling water intake structure(s) from the USFWS or the NMFS.

☐ Yes ☒ No

If yes, attach any information submitted in order to obtain that permit, which may be used to supplement the permit application information requirements of paragraph *40 CFR § 125.95(f)*.

Attachment: N/A

b. Is the facility requesting a waiver from application requirements at *40 CFR § 122.21(r)(4)* in accordance with *40 CFR § 125.95* for any CWIS(s) that withdraw from a man-made reservoir that is stocked and managed by a state or federal natural resources agency or the equivalent?

☒ Yes ☐ No

If **yes**, attach a copy of the most recent managed fisheries report to TPWD, or equivalent.

Attachment: T-2 Cooling Water System, Appendix 2. 2021 Granbury Reservoir Fisheries Report

c. There are no federally listed threatened or endangered species or critical habitat designations within the source water body.

☒ True ☐ False

Item 2. Source Water Biological Data (Instructions, Page 109)

New Facilities (Phase I, Track I and II)

- Provide responses to all items in this section and stop.

Existing Facilities (Phase II)

- If the answer to **1.b.** above was **no**, provide responses to all items in this section and proceed to Worksheet 11.3.
- If the answer to **1.b.** was **yes** and **1.c.** was **true**, do not complete any items in this section and proceed to Worksheet 11.3.
- If the answer to **1.b.** was **yes** and **1.c.** was **false**, attach a response for any item in this section that is not contained within the most recent TPWD, or equivalent and proceed to Worksheet 11.3.

Attachment: N/A

a. A list of the data requested at *40 CFR § 122.21(r)(4)(ii)* through *(vi)* that are not available, and efforts made to identify sources of the data.

b. Provide a list of species (or relevant taxa) in the vicinity of the CWIS and identify the following information regarding each species listed.
   - all life stages and their relative abundance,
   - identification of all species and life stages that would be most susceptible to impingement and entrainment,
   - forage base,
   - significance to commercial fisheries,
   - significance to recreational fisheries,
   - primary period of reproduction,
   - larval recruitment, and
   - period of peak abundance for relevant taxa.

c. Data representative of the seasonal and daily activities (e.g., feeding and water column migration) of biological organisms in the vicinity of the CWIS(s).

d. Identify all threatened, endangered, and other protected species that might be susceptible to impingement and entrainment at the CWIS(s).

e. Documentation of any public participation or consultation with federal or state agencies undertaken.

The following is required for existing facilities only. Include the following information with the above listed attachment.

f. Identify any protective measures and stabilization activities that have been implemented and provide a description of how these measures and activities affected the baseline water condition in the vicinity of the intake.

g. A list of fragile species, as defined at *40 CFR § 125.92(m)*, at the facility. The applicant need only identify those species not already identified as fragile at *40 CFR § 125.92(m)*.

NOTE: New units at an existing facility are not required to resubmit this information if the cooling water withdrawals for the operation of the new unit are from an existing intake.

INDUSTRIAL WASTEWATER PERMIT APPLICATION WORKSHEET 11.3: ENTRAINMENT

This worksheet **is required** for all TPDES permit applications that **meet the conditions outlined in Technical Report 1.0, Item 12**. Complete one copy of this worksheet for **each** individual CWIS the facility uses or proposes to use.

CWIS ID: Wolf Hollow Intake

Item 1. Applicability (Instructions, Page 111)

Is the AIF of the CWIS identified above greater than, or equal to, 125 MGD?

☐ Yes ☒ No

- If **no** or the facility has selected **CCRS** [*40 CFR § 125.94(c)(1)*] for the impingement mortality compliance method, complete Item 2 and stop here.
- If **yes** and the facility is **seeking a waiver** from application requirements in accordance with *40 CFR § 125.95* for any CWIS(s) that withdraw from a man-made reservoir that is stocked and managed by a state or federal natural resources agency or the equivalent, complete item 2 and stop.
- If **yes** and the facility is **not seeking a waiver** from application requirements in accordance *with 40 CFR § 125.95*, complete item 2 and provide any required and completed studies listed in item 3. For any required studies in item 3 that are not complete, provide a detailed explanation for the delay and an anticipated schedule for completion and submittal.

Item 2. Existing Entrainment Performance Studies (Instructions, Page 111)

Attach any previously conducted studies or studies obtained from other facilities addressing technology efficacy, through-facility entrainment survival, and other entrainment studies.

Attachment: T-2 Cooling Water System, Impingement and Entrainment Studies

Item 3. Facility Entrainment Performance Studies (Instructions, Page 111)

a. Attach an entrainment characterization study, as described at *40 CFR § 122.21(r)(9)*: N/A

b. Attach a comprehensive feasibility study, as described as *40 CFR § 122.21(r)(10)*: N/A

c. Attach a benefits valuation study, as described as *40 CFR § 122.21(r)(11)*: N/A

d. Attach a non-water quality environmental and other impacts study, as described as *40 CFR § 122.21(r)(12)*: N/A

e. Attach a peer review analysis, as described as *40 CFR § 122.21(r)(13)*: N/A

Table 1. Wastewater Flows by Outfall

Outfall	Wastewater Sources	Monthly Average (MGD)	Flow % by Wastewater Source	Applicable Effluent Guideline (EGL)[1]
001	Cooling tower blowdown	1.241	99.8%	40 CFR 423.15(a)(1),(10)(i)
	Boiler blowdown [2]	N/A	N/A	N/A
	Low volume wastes (via Outfall 101)	0.002	0.2%	40 CFR 423.15(a)(3)
	Outfall 001 Total	1.243	100%	
101	Low volume wastes [3]	0.002	100%	40 CFR 423.15(a)(3)

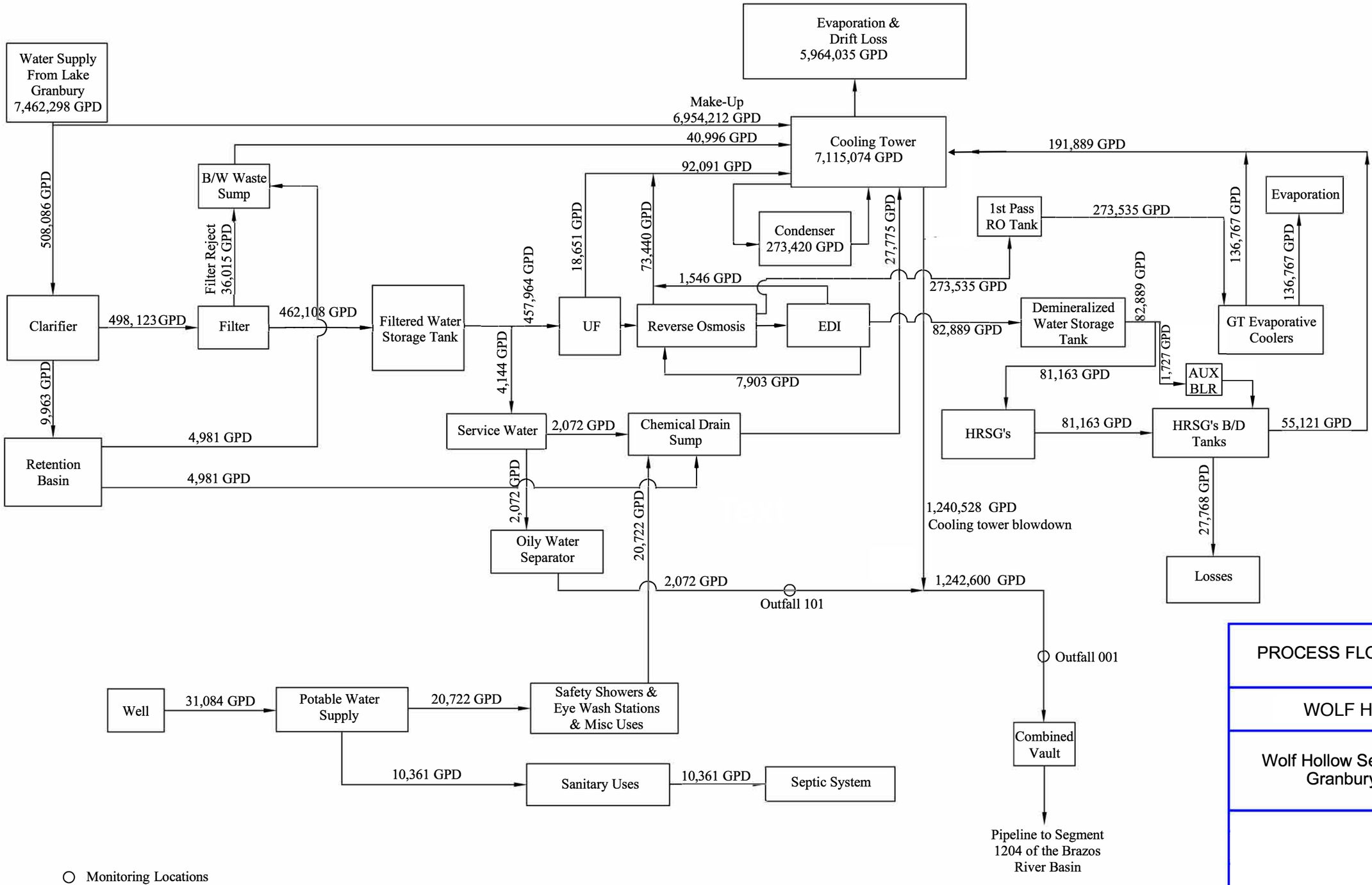
Notes

[1] 40 CFR 423 - Steam Electric Generating

[2] Blowdown from the heat recovery steam generators (HRSGs) is directed to the cooling water system as makeup water.

[3] Includes turbine cooler blowdown, boiler blowdown, reverse osmosis reject, service water reject, oil/water separator wastewater. HRSG blowdown and water treatment wastewaters are directed to the cooling water system as makeup water.

N/A Not applicable



PROCESS FLOW DIAGRAM

WOLF HOLLOW I

Wolf Hollow Services, L.L.C.
Granbury, Texas

ATTACHMENT T-1

WOLF HOLLOW I GENERATING STATION
FACILITY DESCRIPTION

ATTACHMENT T-1

WOLF HOLLOW I GENERATING STATION
FACILITY DESCRIPTION

INTRODUCTION

This document describes the Wolf Hollow I Generating Station near Granbury, Texas in relation to its wastewater discharge TPDES Permit No. WQ0004288000. This description includes outfall locations and wastewaters discharged, wastewater and stormwater management, and applicability of national effluent guidelines.

SITE OPERATIONS

Wolf Hollow I, a natural gas-fired combined-cycle steam electric generating station, is located in Hood County near Granbury, Texas. Wolf Hollow I began operating in 2003 and has a nominal generating capacity of 807 gross megawatts (MW).

WASTEWATER SYSTEM AND OUTFALLS

There are two wastewater outfalls authorized by Wolf Hollow I's TPDES Permit No. WQ0004288000, Outfalls 001 and 101. A water balance and wastewater flow schematic is provided in Figure 1. Wastewaters that are discharged through the outfalls are listed in Table 1.

Raw water from Lake Granbury is routed to the cooling tower and to the water treatment system. Water treatment includes clarification, filtration, reverse osmosis (RO), and electro-deionization (EDI) to produce ultra-pure water. Clarifier sludge is routed to the sludge retention basin. Filter backwash and RO reject water are routed to the cooling tower as makeup water. EDI reject water can be routed to the RO unit or the cooling tower. Ultra-pure water is routed to the heat recovery steam generators (HRSGs) and recirculated; recovered heat is used to generate steam in the boiler. HRSG (boiler) blowdown is routed to the cooling tower as makeup water.

Outfall 001

Outfall 001 is authorized to discharge cooling tower blowdown, boiler blowdown, and low volume waste sources (via internal Outfall 101). Outfall 001 commingles with the discharge from the adjacent Wolf Hollow II generating station (wastewater discharges authorized under separate TPDES permit WQ0005285000) in a common pipe, which conveys the discharges to the Brazos River below Lake Granbury in Segment No. 1204 of the Brazos River Basin.

Internal Outfall 101 – Low Volume Wastes

Low volume wastes is a regulatory term specifically defined in the effluent guidelines at 40 CFR 423 for the Steam Electric Power Generating industrial category. Low volume wastewaters that are generated at Wolf Hollow I are listed in Table 1. Floor and equipment washdowns are low volume wastes and are routed to the oil/water separator. The water discharge from the separator is internal Outfall 101, which is routed to Outfall 001. HRSG blowdown and wastewaters from water treatment, which are also low volume wastes, are routed to the cooling water system as makeup water.

Stormwater

Stormwater is routed to the Stormwater Pond located on the northeast side of the facility. This stormwater was determined not to be subject to Sector O (Steam Electric Generating Facilities) of the TCEQ's Multi-sector General Permit (MSGP) because the site is a combined-cycle facility utilizing natural gas and where no supplemental fuel oil is burned.[1]

Domestic Wastewater

Domestic wastewater is treated in an on-site septic system.

EFFLUENT GUIDELINES

National effluent guidelines that apply to process wastewaters at Wolf Hollow I are those for Steam Electric Power Generating at 40 CFR 423 (see Table 1 for wastewater sources and flows).

[1] Letter from Jaya Zyman-Ponebshek (TCEQ) to Greg Haunschild (Argent Consulting Services, Inc.), July 8, 2009.

Table 1. Wastewater Flows by Outfall

Outfall	Wastewater Sources	Monthly Average (MGD)	Flow % by Wastewater Source	Applicable Effluent Guideline (EGL)[1]
001	Cooling tower blowdown	1.241	99.8%	40 CFR 423.15(a)(1),(10)(i)
	Boiler blowdown [2]	N/A	N/A	N/A
	Low volume wastes (via Outfall 101)	0.002	0.2%	40 CFR 423.15(a)(3)
	Outfall 001 Total	1.243	100%	
101	Low volume wastes [3]	0.002	100%	40 CFR 423.15(a)(3)

Notes

[1] 40 CFR 423 - Steam Electric Generating

[2] Blowdown from the heat recovery steam generators (HRSGs) is directed to the cooling water system as makeup water.

[3] Includes turbine cooler blowdown, boiler blowdown, reverse osmosis reject, service water reject, and floor/equipment washdown. HRSG blowdown and water treatment wastewaters are directed to the cooling water system as makeup water.

N/A Not applicable

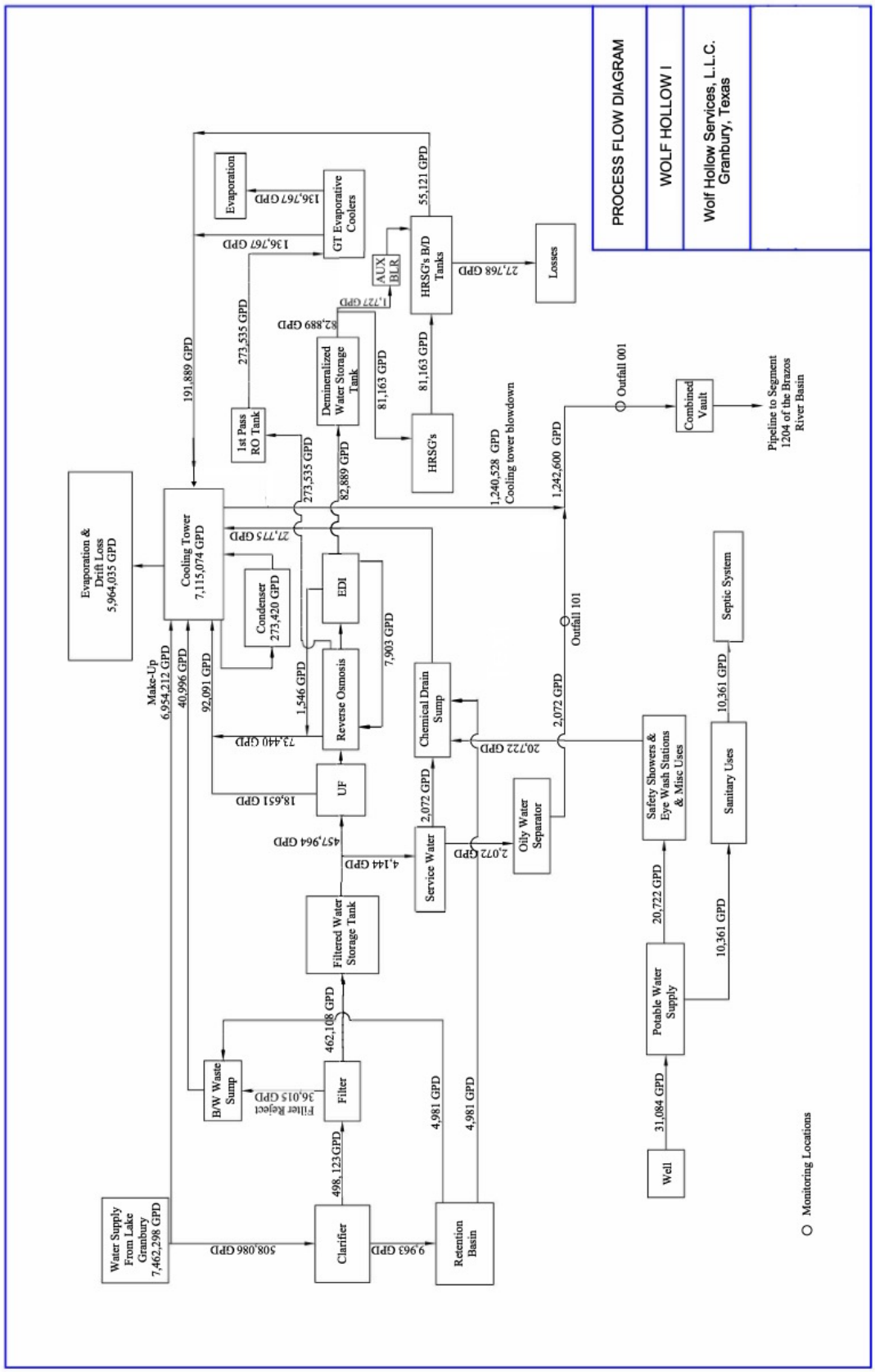


Figure 1. Water Balance Schematic

Figure 2. Facility Map

ATTACHMENT T-2

WOLF HOLLOW I
COOLING WATER SYSTEM

ATTACHMENT T-2

WOLF HOLLOW I
COOLING WATER SYSTEM

INTRODUCTION

This document describes the cooling water system at the Wolf Hollow I power station in relation to its wastewater permit TPDES WQ0004288000 and regulations for cooling water intake systems (CWIS) at 40 CFR 125, Subpart J.[1]

Wolf Hollow I, a natural gas-fired combined-cycle steam electric generating station, is located in Hood County near Granbury, Texas. Wolf Hollow I began operating in 2003 and has a nominal generating capacity of 807 gross megawatts (MW).

OVERVIEW OF COOLING WATER SYSTEM

Wolf Hollow I's operates with a closed cycle recirculating water system (CCRS) equipped with a mechanical draft cooling tower. Make-up water for Wolf Hollow I's CCRS is withdrawn from Lake Granbury via an offshore CWIS. This CWIS also provides cooling water for an adjacent facility, Wolf Hollow II, and make-up water for Wolf Hollow II's closed cooling water loop (CCW)[2] for auxiliary cooling.

The CWIS in Lake Granbury connects to the station via a 19,800-foot long underground pipe, which starts at the pumping station on Lake Granbury's southwest shore and connects to the station about 3.5 miles southwest of the lake (see Figure 1). The CWIS provides make-up water to the CCRS to offset losses due to evaporation. The mechanical draft cooling tower, situated on the northeast portion of the site, operates with 14 cooling tower fans.

The CWIS has a total design intake flow (DIF) of 6,900 gallons per minute (gpm), or 9.9 million gallons per day (MGD). The CWIS consists of three intake barrels that are attached to three screened intakes by 24-inch steel pipes (for design drawings, see Appendix 1). Each intake barrel is equipped with a submersible motor and vertical turbine pump to withdraw water from the lake. The screened intakes are 8-foot by 14-foot steel boxes that open on the north side and are covered with an 8-foot by 14-foot screened intake composed of ¼-inch wire cloth mesh. The maximum design through-screen velocity is 0.5 feet per second (fps), however, Wolf Hollow's actual through-screen velocity is approximately 0.18 fps (Exelon 2014, FNI 2014).

Three 30-inch diameter, 141-foot long intake barrels, each comprised of three 35-foot sections of pipe, are fastened to three concrete structural piers in the lake. The barrels extend approximately 112 feet into Lake Granbury from a riprap retaining wall on the southwest shore and sit approximately 10 feet off the

[1] 40 CFR 125, Subpart J, Requirements Applicable to Cooling Water Intake Structures for Existing Facilities Under Section 316(b) of the Clean Water Act

[2] This type of cooling water system is referred to as a closed cycle recirculating cooling water system (CCRS) in USEPA's 2014 regulations implementing Section 316(b) of the Clean Water Act.

lake bottom. The pump, motor, and discharge piping allow water intakes at elevations of 680 and 665 mean sea level (MSL) to ensure withdrawal capabilities at lower water levels.

The intake pipes are oriented downward at an angle similar to that of the lake bed with the third screened intake sitting slightly higher in the water column. Each of the three screened intakes has a slide gate with wire rope allowing a station technician to open and close the pipe from inside the valve vault. The water is conveyed from the offshore barrels via a buried pipeline extending approximately 19,800 feet from Lake Granbury to the station. The pipe from the barrels connect to an intake vault approximately 40 feet from the edge of the lake. Makeup water is then conveyed to an 18-inch pipeline to the station by three make-up water pumps rated at 2,300 gpm each.

The CCRS was designed to minimize the amount of make-up water required to be withdrawn, typically operating at five to six cycles of concentration, depending on the concentration of total dissolved solids, hardness, conductivity, and turbidity in the water. Blowdown from the heat recovery steam generators (HRSGs) is recirculated as makeup water to the cooling tower, further reducing the need to withdraw additional water from the lake. Between January 2023 and December 2024, the station withdrew an average of 2.07 MGD and returned an average 0.47 MGD (Outfall 001), approximately 23% of the water withdrawn for cooling as blowdown to the Brazos River below the De Cordova Dam.

Wolf Hollow II uses an air-cooled condenser (ACC) to condense the steam back to water. The CWIS supplies water to Wolf Hollow II for its CCW or CCRS auxiliary cooling water system. This water is also used as feed water for Wolf Hollow II's ultrafiltration (UF), reverse osmosis (RO), and electrodeionization (EDI) systems. The UF backwash, RO reject water, and the HRSG blowdown are discharged as low volume wastes under Wolf Hollow II's separate TPDES permit WQ0005285000 Outfall 001.

DESIGN AND AVERAGE INTAKE FLOW

The Design Intake Flow (DIF) of 9.9 MGD was determined using the manufacturer's nameplate capacity for the CWIS pumps.

Table 1. Design Intake Flow

Design Intake Flow	
gpm	MGD
6,900	9.9

The five-year monthly average Actual Intake Flows (AIF) from January 2020 – December 2024 is shown in Table 2. For this period, the 5-year average AIF ranged from 0.570 MGD in December to 3.670 MGD in August, with an overall annual average of 1.727 MGD (17% of DIF).

Table 2. Wolf Hollow Monthly Average Intake Flows (MGD) Jan 2020 – Dec 2024

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2020	0.354	0.618	1.323	0.915	0.107	1.876	3.123	3.557	1.690	1.137	0.531	0.487	1.310
2021	1.176	0.569	0.793	1.210	0.464	2.423	3.122	3.377	1.711	1.854	1.100	0.007	1.484
2022	0.017	0.947	0.787	0.558	1.692	2.654	3.421	3.359	2.672	1.507	1.930	0.833	1.698
2023	0.932	0.867	0.645	0.941	2.557	3.268	3.954	4.123	3.819	1.998	0.422	0.785	2.026
2024	1.618	0.721	1.883	0.149	2.059	2.635	3.382	3.935	3.608	2.862	1.834	0.740	2.119
Average	0.819	0.744	1.086	0.755	1.376	2.571	3.400	3.670	2.700	1.872	1.163	0.570	1.727

Capacity utilization rates for Wolf Hollow I over the January 2020 – December 2024 period are shown in Table 3. The overall 5-year average was 17% with no year less than 8%. As shown in table, Wolf Hollow I operates most frequently during the warmest months (June – September). Routine maintenance is typically during the fall or spring, the duration of which depends on the type and amount of maintenance required.

Table 3. Wolf Hollow I Capacity Utilization Rate Jan 2020 – Dec 2024

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2020	4%	6%	13%	9%	1%	19%	31%	36%	17%	11%	5%	5%	13%
2021	12%	6%	8%	12%	5%	24%	31%	34%	17%	19%	11%	0.1%	15%
2022	0%	10%	8%	6%	17%	27%	34%	34%	27%	15%	19%	8%	17%
2023	9%	9%	6%	9%	26%	33%	40%	42%	38%	20%	4%	8%	20%
2024	16%	7%	19%	2%	21%	27%	34%	40%	36%	29%	18%	7%	21%
Average	8%	7%	11%	8%	14%	26%	34%	37%	27%	19%	12%	6%	17%

The percentage of intake flow used as contact cooling, non-contact cooling, process water, and other uses was calculated from the water flow diagram (Attachment T-1 Facility Description, Figure 1 Process Flow Diagram).

Within the past five years, Wolf Hollow I has not experienced any unusual or extended outages that would have caused any significant effect on current data for flow, impingement, entrainment, or any other factor.

Major upgrades in the last 15 years include the following:

- In 2012, both combustion turbines for Wolf Hollow I were upgraded. The project consisted of modifications to the 2C Cooler, Annuabar, Row 1 Turbine Blade Ring, Row 2 Interstage Seal, Row 2 Turbine Blade Ring, and Static Seal.
- In 2015, the Lift Station Pump Barrel Extension Project was started, which added a 35-foot long section to the existing 3-pipe intake barrel and also included construction of a pier to support the new pipe barrel location (see Appendix 1).
- In 2020, both combustion turbines were upgraded to a wet compression system. Wet compression increases the power output of the combustion by reducing inlet air temperatures to the compressor and is only operated during summer months.
- In 2020, the facility performed a Kai upgrade on Unit E-ST1 gas turbine, consisting of thermal barrier coatings and optimized cooling schemes applied to turbine components to achieve increased performance.

- In 2025, the facility performed a Kai upgrade on Unit E-ST2 gas turbine, consisting of thermal barrier coatings and optimized cooling schemes applied to turbine components to achieve increased performance.

IMPINGEMENT AND ENTRAINMENT STUDIES

In 2019, the TCEQ determined that the design intake velocity equal to or less than 0.5 feet per second reduces the impingement and entrainment of aquatic organisms and meets Best Technology Available (BTA) standards.[3]

SOURCE WATERBODY

The source waterbody of Wolf Hollow I's cooling water intake structure (CWIS) is Lake Granbury. Lake Granbury is a manmade reservoir that was formed in 1969 by impoundment of the Brazos River by the De Cordova Bend Dam (TWDB 2016). The lake is operated by the Brazos River Authority.

Physical Characteristics

Physical characteristics of Lake Granbury are summarized in Table 4. The lake is approximately 33 miles (53 kilometers, km) in length and is approximately 0.9 miles (1.4 km) in width at its widest point (Bio-West 2008). The lake has an approximate total surface area of 12.8 square miles (33.1 square km) (TWDB 2016).

Table 4. Lake Granbury Characteristics

Feature	Size	
Length / Width (at widest point)	33 miles	0.9 miles
Area / Capacity (top of gates / emergency spillway)[4]	8,282 acres	136,326 acre-feet
Water depth	10-70 feet 18 feet (average)	
Average surface temperature	50 °F (winter)	86 °F (summer)

The overall mean depth of the lake is approximately 18 feet. Depths in the lake range from less than 10 feet to 70 feet, with the deepest waters occurring near the dam in the old channel bed of the Brazos River (TWDB 2003). In this section of the lake, depths increase rapidly with distance from the shore.

[3] TPDES WQ0004288000 Fact Sheet (December 23, 2019), pg. 7.

[4] Volumetric and Sedimentation Survey of Lake Granbury, Texas Water Development Board, August 2016.

Monitoring of Lake Granbury at depths spanning from 1 to 65 ft from 1971-1979 observed a mean specific conductivity of 2,407 micro-siemens per centimeter (µs/cm) with a range of 302 to 4,480 µs/cm (TDWS 1983). At the average recorded water temperature of 70.3 degrees Fahrenheit (°F) (21.3 degrees Celsius, °C) observed in Lake Granbury over that time span, this corresponds to a mean salinity of 1.3 parts per thousand (ppt) with a range of 0.157 to 2.59 ppt. Average surface conductivity among four sites sampled in Lake Granbury in 2008 ranged from 122.0 µs/cm in fall to 159.3 µs/cm in spring (Bio-West 2008). Based on these conductivity measurements and the corresponding water temperatures, the estimated salinity of the surface waters of Lake Granbury was < 1 ppt in 2008.

Water quality monitoring of Lake Granbury at depths spanning from 1 to 65 ft from 1971 to1979 observed a mean temperature of 70.3 °F (21.3 °C) with a range of 32–95 °F (0–35 °C) (TDWS 1983). Monitoring of surface water temperatures of Lake Granbury among four sites in 2008 observed a mean temperature of 70.9 °F (21.6 °C), with average seasonal temperatures ranging from 49.8 °F (9.8 °C) in winter to 86.2 °F (30.1 °C) in summer (Bio-West 2008). Water temperatures rarely fall below freezing in Lake Granbury (Luminant 2009).

Field data from Lake Granbury indicate that weak thermal stratification occurs during the spring and summer months that may easily be disrupted by disturbances such as an influx of floodwater or a thunderstorm (Ward 2008).

Lake Granbury is fed by the Brazos River. Daily streamflow is monitored for the Brazos River near Dennis, TX (USGS Gage No. 08090800), approximately 40 river miles (64 km) upstream of the dam. The average annual streamflow at the Dennis, TX gage was 563 cfs (water year 2024). Downstream releases from Lake Granbury are controlled by the Brazos River Authority via a gate-controlled ogee weir (TWDB 2016).

Figure 3 is a contour map of Lake Granbury at 5 foot intervals (TWDB 2016). Lake Granbury's shoreline consists of bulkhead and natural structures. The littoral zone is dominated by manmade features, primarily standing timber, dead trees, and stumps (Luminant 2009). Geotechnical evaluations indicate that the sediment in this region is generally a mix of clay and limestone, with silt proportions increasing with distance from shore (FNI 2014). Based on two methods for estimating sedimentation rates, sedimentation in Lake Granbury has resulted in an average loss of capacity of 278 and 373 acre-feet per year since impoundment (TWDB 2016).

Area of Influence

An analysis of the Area of Influence (AOI) for the Wolf Hollow was previously presented in the 2019 TPDES application. The results of the modeling simulation are shown in Figure 4. The AOI indicated in the figure is greatest at the middle intake (lower right), extending to a maximum distance of 6.9 feet from the intake screen. The AOI with a single screen in operation extends approximately 11.3 feet from the screen.

FISHERIES REPORT

The most recent fisheries report for Granbury Reservoir was issued in 2022 and is included here as Appendix 2.

PERMIT MONITORING ACTIVITIES

Other Requirement No. 5.B.1 in the TPDES permit WQ0004288000 requires monitoring of the CWIS operation in accordance with procedures[5] submitted to and approved by the TCEQ. Other Requirement No. 5.B.2 requires that the results of monitoring activities conducted during the term of the the permit be submitted in the subsequent TPDES permit renewal application. Results of monitoring activities are provided below.

Weekly and monthly local preventive maintenance checks are conducted at the intake structure to include visual inspections of the three pump upper barrel sections, pump discharge and check valves, minimum recirculation valve, and surge anticipator/rupture disc. Intake equipment such as pumps and valves are operated and maintained in accordance with manufacturer's recommendations and good engineering practices, which are incorporated into the preventive maintenance checks. Completion of preventive maintenance checks is logged and notes are recorded for any unusual conditions, corrective actions, or required follow-up work. Remote indications for equipment status (including flow, pressure, valve position) are constantly monitored with necessary actions taken to maintain normal operating conditions and records of corrective maintenance are logged.

[5] Letter from Gregg Vines, Exelon Corporation, to Shannon Gibson and Mónica Vallín-Baez, TCEQ, March 5, 2020.

REFERENCES

Bio-West, Inc., Lake Granbury Characterization Study, Final Report, submitted to Enercon Services, Inc., March 2008.

Exelon – WH Cooling Tower Intake Flow Velocity.xlsx, Exelon Corporation, September 10, 2014.

Freese and Nichols (FNI), Technical Memorandum, Wolf Hollow Intake Pump Barrel Extension at Lake Granbury, July 22, 2014.

Luminant Generation Company LLC, Comanche Peak Nuclear Power Plant Units 3 and 4, COL Application Environmental Report, November 20, 2009.

Texas Department of Water Resources (TWDB), Water Quality of Lake Granbury, North Central Texas, December 1983.

Texas Water Development Board (TWDB), Volumetric Survey of Lake Granbury, prepared for the Brazos River Authority, March 2003.

Texas Water Development Board (TWBD), Volumetric and Sedimentation Survey of Lake Granbury, August 2016.

G.H. Ward, Potential Impacts of Comanche Peak Cooling Tower Operations on Total Dissolved Solids in the Lower Reach of Lake Granbury, January 31, 2008.

Figure 1. Site Location Map

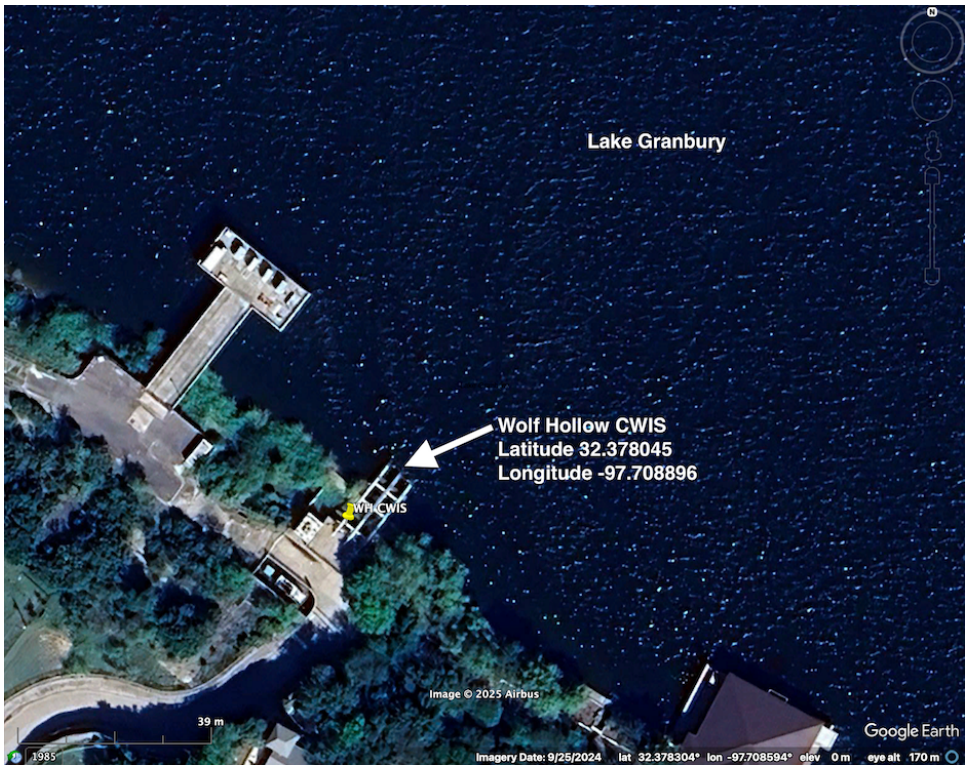


Figure 2. Location of CWIS

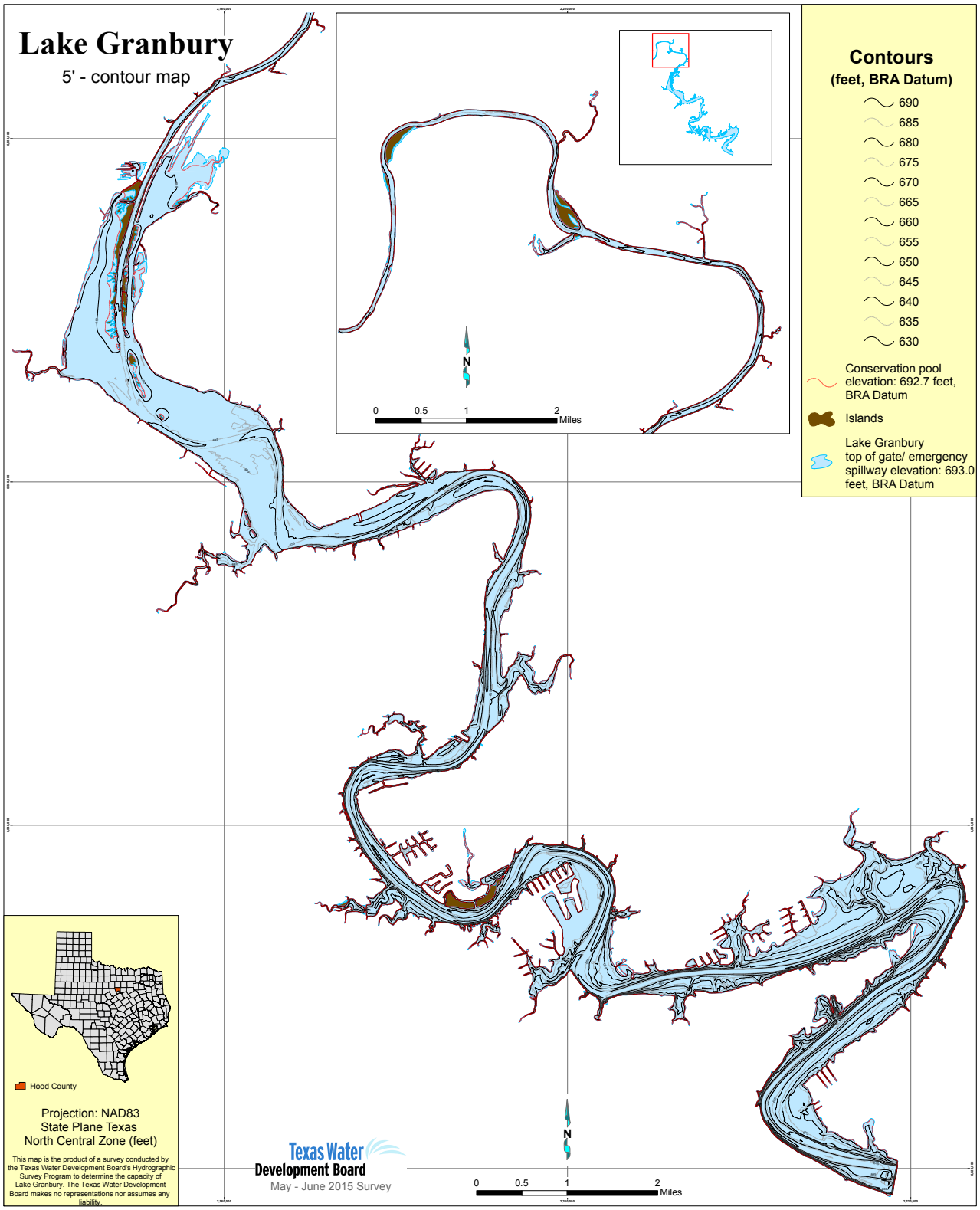


Figure 3. Lake Granbury Contours

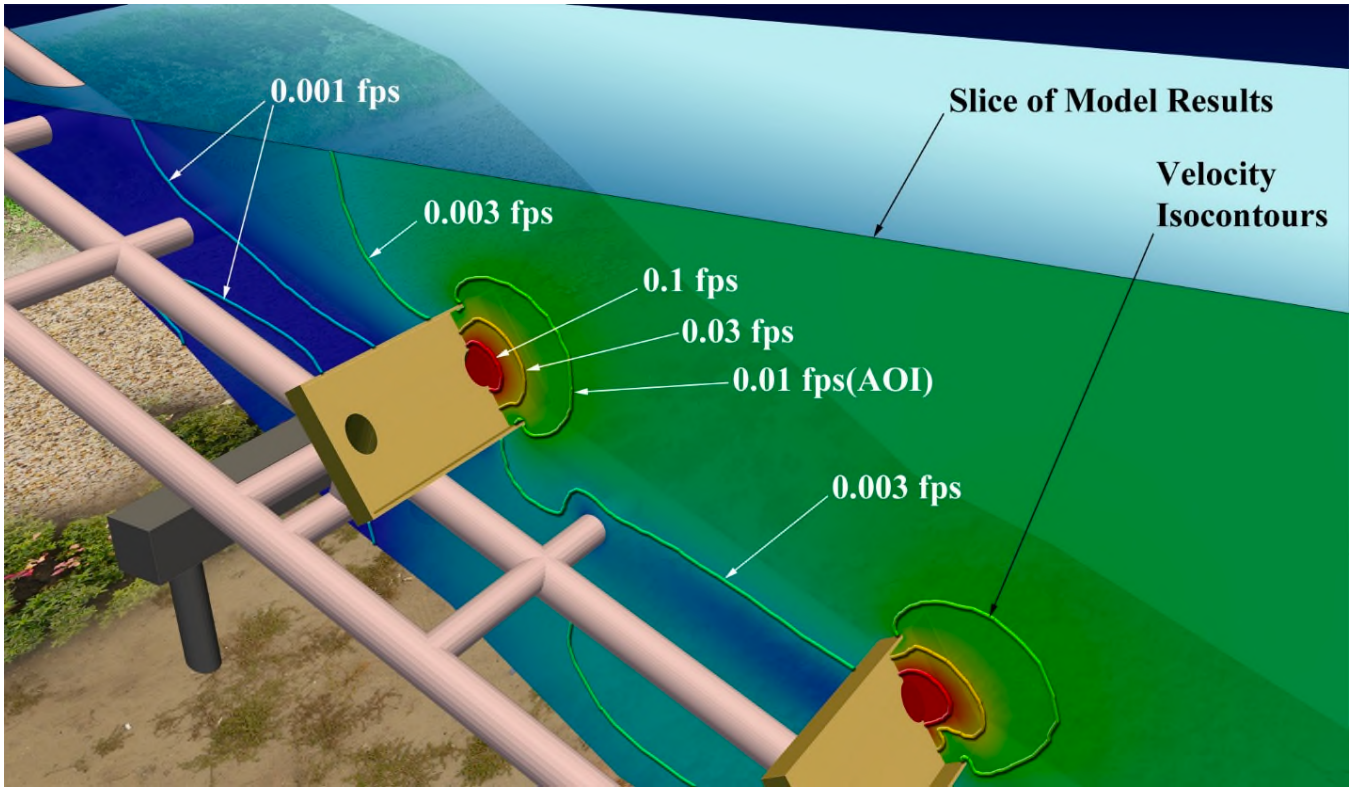


Figure 4. CWIS Area of Influence

Appendix 1. Wolf Hollow CWIS Structural Detail

EXELON GENERATING COMPANY, LLC.

EXELON WOLF HOLLOW GENERATING STATION

CONSTRUCTION PLANS FOR

INTAKE PUMP BARREL EXTENSION

MARCH, 2015

FREESE AND NICHOLS

4055 International Plaza, Suite 200
Fort Worth, Texas 76109-4895
Phone - (817) 735-7300
Fax - (817) 735-7491

EPT14311

This Record Drawing is a combination of the sealed engineering contract drawings for this project, modified by information furnished by the contractor reflecting changes in the Project made during construction. The original sealed drawings are on file at the offices of

FREESE AND NICHOLS, INC.
4055 INTERNATIONAL PLAZA, SUITE 200
FORT WORTH, TEXAS 76109-4895
(817) 735-7300
RECORD DRAWINGS PREPARED ON:
7/20/2015

THE SEAL THAT ORIGINALLY APPEARED ON THIS DOCUMENT WAS AUTHORIZED BY ALAN C. HUTSON, P.E.
TEXAS NO. 90178
On 7/20/2015
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION OF THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

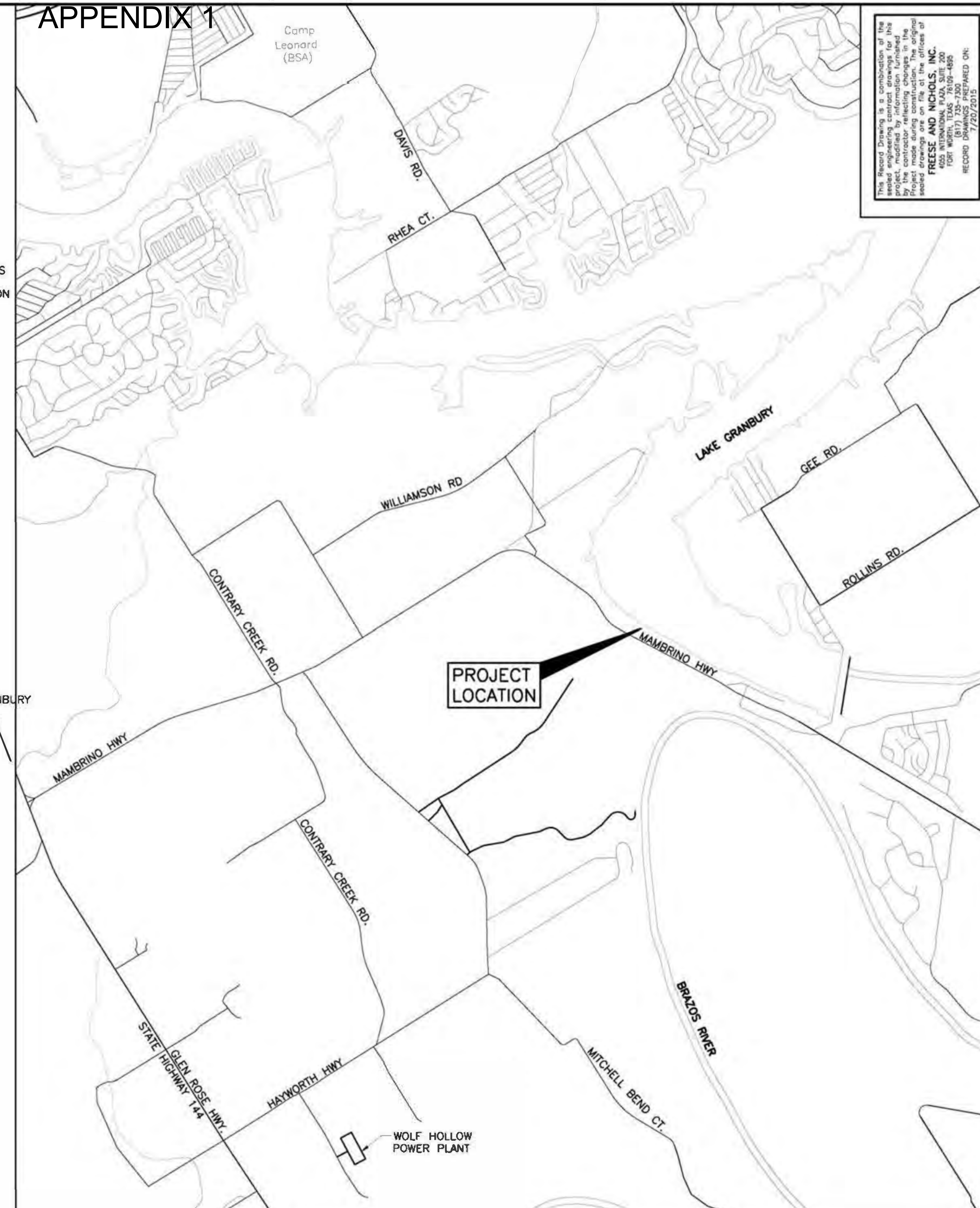
Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

APPENDIX 1

LEGEND OF SYMBOLS

- SOIL – SECTION VIEW
- WEATHERED BEDROCK – SECTION VIEW
- GRAY UNWEATHERED LIMESTONE – SECTION VIEW
- CONCRETE – SECTION VIEW
- B-1 BORING
- EXISTING WATER VALVE
- G W WATER METER OR GAS METER
- FIRE HYDRANT
- SWB OVERHEAD UTILITIES
- 10" W UNDERGROUND UTILITIES
- POWER POLE
- GUY WIRE AND ANCHOR
- T TELEPHONE PEDESTAL
- SIGN
- IRON ROD
- P.I. W/ IRON ROD
- MONUMENT
- P.O.T. W/IRON ROD
- BM-2 BENCH MARK AND / OR T.B.M.
- TREE
- BARBED WIRE FENCE
- CHAIN LINK FENCE OR WOOD FENCE
- RAILROAD
- CONCRETE PAVING
- ASPHALT PAVING
- BRUSH OR DENSE TREES
- CUT FILL CUT OR FILL SLOPES
- CREEK OR DRAINAGE PATH
- LIMITS OF TEMPORARY EASEMENT
- LIMITS OF PERMANENT EASEMENT
- PROPERTY LINE AND / OR R.O.W.
- 2+00 BASELINE
- EXISTING CHAINLINK FENCE
- EXISTING BARBED WIRE FENCE

INDEX OF DRAWINGS



LOCATION MAP

This Record Drawing is a combination of the sealed engineering contract drawings for this project, modified by information furnished by the contractor reflecting changes in the Project made during construction. The original sealed drawings are on file at the offices of FREESE AND NICHOLS, INC. 4055 INTERNATIONAL PLAZA, SUITE 200 FORT WORTH, TEXAS 76109-4895 (817) 735-7300 RECORD DRAWINGS PREPARED ON: 7/20/2015

Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144

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EXELON GENERATING COMPANY, LLC
EXELON WOLF HOLLOW GENERATING STATION
GENERAL
INDEX OF DRAWINGS, LEGEND, AND LOCATION MAP

FNI JOB NO. EPT14311 | DATE 8/29/14 | DESIGNED RP | DRAWN BH | CHECKED AH
RECORD DRAWINGS BH 7/20/15
FILE NAME CV-ALL-GN-INDX.DWG
VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET G-1
SEQ. 1

APPENDIX 1

GENERAL NOTES

1. CONTRACTOR SHALL VERIFY DEPTH AND LOCATIONS OF ALL UTILITIES PRIOR TO PIPE MANUFACTURING, WHETHER SHOWN ON PLANS OR NOT. SEE LIST BELOW FOR PARTIAL LIST OF UTILITY OWNERS AND OTHER CONTACTS.
2. CONTRACTOR SHALL CLEAN THE PROJECT SITE OF ANY AND ALL TRASH.
3. ALL GATES SHALL BE KEPT CLOSED OR A GUARD SHALL BE PROVIDED TO CONTROL ACCESS TO THE PROJECT SITE.
4. FOLLOWING INSTALLATION OF THE PIPELINES ACROSS WATERWAYS, WATERWAY BOTTOM AND NATURAL SHORELINE CONTOURS SHALL BE RESTORED TO THEIR ORIGINAL CONFIGURATION AND REVEGETATED OR OTHERWISE STABILIZED.
5. THE CONTRACTOR SHALL MINIMIZE TURBIDITY IN WATERWAYS DURING ALL PHASES OF THE PROJECT, INCLUDING DREDGE, DECANT, FILL AND CONSTRUCTION. THE CONTRACTOR SHALL EMPLOY ADEQUATE METHODS TO INSURE MINIMUM TURBIDITY FROM NEAR AND LONG TERM EROSION FORM FILL, SPOIL, AND OR DEVEGETATED AREAS DURING AND FOLLOWING CONSTRUCTION. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS CONCERNING WATER POLLUTION AND CONTROL OF EROSION.
6. VERIFY THE LOCATION OF ALL SURVEY CONTROL INFORMATION SHOWN PRIOR TO BEGINNING CONSTRUCTION
7. MAXIMUM SPEED LIMIT ON THE PROJECT SITE SHALL BE 5 M.P.H.
8. NO FIREARMS SHALL BE PERMITTED ON THE PROJECT SITE.
9. NO FIRES WILL BE ALLOWED.
10. ROCK AND DEBRIS SHALL BE REMOVED FROM THE PROJECT, UNLESS WRITTEN PERMISSION IS PROVIDED FROM THE LAND OWNER. COPIES OF ALL PERMISSIONS GRANTED SHALL BE PROVIDED TO THE ENGINEER, OWNER, AND INSPECTOR.
11. BLASTING WILL NOT BE ALLOWED.
12. NO TREES MAY BE REMOVED. THE CONTRACT SHALL BE REDUCED BY $500.00 FOR EACH TREE THAT IS REMOVED.
13. THE CONTRACTOR SHALL CONTROL EROSION AND SEDIMENTATION PER THE APPLICABLE PERMITS, LAWS, AND REGULATIONS.
14. THE CONTRACTOR SHALL REMOVE ROCK FROM THE DISTURBED AREAS SUCH THAT IT IS LEFT WITH NO MORE QUANTITY OR SIZE OF ROCK THAN THE LAND ADJACENT TO THE AREA.
15. THE CONTRACTOR MAY NOT USE PRIVATELY OWNED ROADS, UNLESS HE OBTAINS PERMISSION FROM THE LANDOWNERS. CONTRACTOR SHALL REPAIR ANY AND ALL DAMAGE TO PRIVATE AND PUBLIC ROADS.
16. THE CONTRACTOR SHALL REPAIR IMMEDIATELY OR HAVE REPAIRED AT HIS COST ALL DAMAGED UTILITIES. REPAIRS SHALL BE MADE WITH EQUIVALENT OR BETTER MATERIALS.

UTILITY OWNERS

OWNER	CONTACT	PHONE NUMBER
LONE STAR GAS	DIGTESS	800-DIG-TESS
T.X.U.	GORDON WILLIAMS	254-897-6278
SOUTHWESTERN BELL	DIGTESS	800-DIG-TESS
ACTON MUNICIPAL UTILITY DISTRICT (A.M.U.D.)	TOM STARR	817-326-4720
BRAZOS RIVER AUTHORITY	RICHARD KUSLER	254-776-1441
UNITED COOPERATIVE SERVICES	JASON T. DILLARD	817-556-4055

PROJECT NOTES

1. EXELON OWNS THE WOLF HOLLOW GENERATING FACILITY IN HOOD COUNTY. MAKE-UP WATER IS PUMPED FROM LAKE GRANBURY TO THE GENERATING FACILITY. THE PURPOSE OF THE PROJECT IS TO EXTEND THE EXISTING SLOPED INTAKE BARRELS AND SUBMERSIBLE PUMPS IN ORDER TO ACCESS DEEPER WATER DURING PERIODS OF DROUGHT AND LOW LAKE LEVELS.
   A. THE EXISTING INTAKE BARRELS ARE SUPPORTED BY THREE SETS OF PIERS AND BEAMS AND THE PUMP VAULT.
   B. SADDLE SUPPORTS CONNECT THE STEEL INTAKE BARRELS TO THE CONCRETE BEAMS AND VAULT.
2. THE WOLF HOLLOW GENERATING PLANT WILL SHUTDOWN BETWEEN APRIL 6, 2015 AND MAY 8, 2015. THE PUMP STATION MUST BE KEPT OPERATIONAL THROUGH APRIL 5, 2015 AND COOLING WATER MUST BE AVAILABLE TO THE PLANT BY ONE PUMP PRIOR TO MAY 4, 2015 AT 6:00 A.M. AND SECOND PUMP OPERATIONAL BY MAY 5, 2015 AT 6:00 A.M. A SINGLE PUMP MAY BE REMOVED UP TO THREE DAYS PRIOR TO THE APRIL 5TH SHUTDOWN.
3. THIS PROJECT WILL REQUIRE THE CONTRACTOR TO:
   A. CONSTRUCT TWO NEW 36-INCH PIERS AND ONE NEW SUPPORT BEAM.
   B. PRIOR TO DRILLING THE NEW 36-INCH PIERS, THE CONTRACTOR WILL DRILL A GEOTECHNICAL BORING FROM A BARGE BETWEEN THE PROPOSED PIERS TO A TIP ELEVATION OF 580 FEET-MSL. THE DRILLER MUST BE APPROVED BY THE ENGINEER. IT IS ESTIMATED THAT THE CONTRACTOR WILL COORDINATE THE GEOTECHNICAL WORK AND SCHEDULE AND PROVIDE THE BARGE. THE BARGE WILL BE NEEDED FOR 3 DAYS TO PERFORM THE BORING AND CORING OF THE BEDROCK. THE ENGINEER WILL BE PRESENT DURING THE GEOTECHNICAL DRILLING TO VERIFY THE BEDROCK DEPTH AND REQUIRED PIER TIP ELEVATION. THE ENGINEER WILL REQUIRE 3 DAYS TO REVIEW THE GEOTECHNICAL DATA AND MAKE RECOMMENDATIONS.
   C. ADD THREE NEW SADDLE SUPPORT ASSEMBLIES ON THE NEW BEAM.
   D. PRIOR TO SLIDING DOWN THE INTAKE, REMOVE THE EXISTING TAPE WRAP SYSTEM, REPAIR DAMAGED COATING SYSTEM ABOVE THE WATER LINE AND APPLY NEW WRAP OR COATING TO PROTECT THE BARREL SECTION THAT WILL BE BETWEEN ELEVATION 682 TO 697 FROM WAVE ACTION (APPROXIMATELY 40 LINEAR FEET OF BARREL).
   E. PRIOR TO SLIDING DOWN THE INTAKE, INSTALL A NEW UPPER INTAKE SCREEN ASSEMBLY BY CUTTING IN NEW 24" CROSS PIPES AS SHOWN IN THE DRAWINGS.
   F. DURING THE PLANNED PLANT SHUTDOWN, THE CONTRACTOR MUST DISCONNECT THE 8-INCH RECIRCULATION PIPING ON THE EXISTING UPPER BARRELS AND PLUG THE OPENINGS WITH 8" BLIND FLANGES.
   G. REMOVE THE TOP HALF OF THE EXISTING SADDLE SUPPORTS AND REPOSITION SLIDE THE EXISTING INTAKE BARREL ASSEMBLY DOWN TO THE NEWLY CONSTRUCTED SUPPORTS, AND RECONNECT THE SADDLE SUPPORTS.
   H. ADD THE NEW BARREL EXTENSION TO THE TOP OF THE ASSEMBLY AND RECONNECT THE SADDLE SUPPORTS FOR THE NEW EXTENSION.
   I. REINSTALL AND RECONNECT THE 8-INCH RECIRCULATION PIPING TO THE NEW 8-INCH OUTLETS ON THE BARREL EXTENSIONS.
   J. INSTALL THE NEW WIRE CABLES THAT CONTROL THE INTAKE SLIDE PLATES. CORE TWO NEW HOLES FOR NEW WIRE CABLES AND ADD BRACKETS IN THE VALVE VAULT.
   K. INSTALL TWO NEW WARNING BUOYS AND RELOCATE TWO EXISTING BUOYS.
   L. RECONNECT AND PLACE INTO SERVICE THE EXISTING IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM.
   M. COORDINATE AS NEEDED WITH SMITH PUMP CO., THE BRAZOS RIVER AUTHORITY (BRA), THE GEOTECHNICAL FIRM, THE OWNER AND ENGINEER.
   N. OTHER APPURTENANT WORK PER THE CONTRACT DOCUMENTS.
4. THE CONTRACTOR, PRIOR TO THE PLANT SHUTDOWN, SHOULD COMPLETE CONSTRUCTION OF THE NEW PIERS, NEW BEAM AND INSTALL THE NEW PIPE SADDLES. THIS WORK IS ANTICIPATED TO OCCUR BETWEEN JANUARY 20, 2015 AND APRIL 1, 2015.
5. SMITH PUMP COMPANY HAS A CONTRACT WITH EXELON TO PROVIDE THE FOLLOWING SERVICES:
   A. MANUFACTURE THE THREE NEW 35-FOOT INTAKE BARREL EXTENSIONS. THE BARREL EXTENSIONS INCLUDE THE 2-INCH CONDUIT FOR THE WIRE CABLE. AIR PIPING WILL NOT BE PROVIDED. PROVIDE NEW 24" INTAKE PIPE AND SCREEN ASSEMBLIES FOR NEW UPPER INTAKE SCREEN.
   B. REMOVE THE THREE EXISTING PUMPING UNITS AT THE BEGINNING OF THE SHUTDOWN PERIOD, APRIL 3-7, 2015.
   C. MANUFACTURE AND EXTEND THE COLUMN PIPES AND PROVIDE NEW, LONGER POWER CABLES
   D. COAT THE NEW BARRELS AND COLUMN PIPES WITH TWO COATS OF TNEMEC 140 POT A POX EPOXY, 9 MIL D.F.T.
   E. PROVIDE NEW WIRE CABLES FOR THE SLIDE PLATES.
   F. RE-INSTALL THE PUMPS AND LENGTHENED COLUMN PIPES IN THE NEWLY EXTENDED BARREL ASSEMBLY TOWARD THE END OF THE SHUTDOWN PERIOD, MAY 3-5, 2015.
   G. ASSIST WITH START-UP OF THE PUMPS IN COORDINATION WITH PLANT STAFF AND GENERAL CONTRACTOR.
6. SMITH PUMP WILL DELIVER NEW BARRELS TO A STAGING AREA NEAR THE BOAT RAMP BY MARCH 24, 2015. EXACT DATE(S) OF DELIVERIES TO BE COORDINATED BY CONTRACTOR. THE CONTRACTOR WILL BE REQUIRED TO ACCEPT DELIVERY AND UNLOAD THE BARREL ASSEMBLY. CONTRACTOR SHALL BE TAKE PRECAUTIONS TO PROTECT THE BARREL COATINGS AND REPAIR ANY POST-DELIVERY DAMAGE TO THE COATINGS.
7. THE CONTRACTOR SHALL COORDINATE WITH THE BRAZOS RIVER AUTHORITY (BRA) FOR ACCESS TO THE BOAT RAMP FOR LAUNCHING OF A BARGE.
8. BRA REQUIRES THAT THE CONTRACTOR LIST BRA AS AN ADDITIONAL INSURED AND THAT A COPY OF THE INSURANCE POLICY TO BE DELIVERED TO THE BRAZOS RIVER AUTHORITY (BRA) LAKE GRANBURY OFFICE PRIOR TO THE BARGE BEING PLACED ON THE LAKE

△1

AS-BUILT NOTES FROM CONTRACTOR:
1. STEEL BEAM FORM LEFT IN PLACE.
2. COATING OF BARRELS EXTENDED DOWN 35' ADDITIONAL LENGTH. MARVEL M91 COATING SYSTEM WAS USED.
3. INSTALLED NEW CATHODIC PROTECTION SYSTEM ANODES AND CABLING SUPPLIED BY EXELON.
4. AIR BURST PIPING WAS INSTALLED FOR ALL 3 INTAKE SCREENS.
5. COTTONWOOD TREE AT NORTHEAST CORNER OF PUMP STATION WAS REMOVED. STUMP WAS NOT REMOVED.
6. PUMP INSTALL INFORMATION:

PUMP NO. 1 (EASTERN SLOT):
- WAS PREVIOUSLY PUMP NO. 1
- DATE OF LAST INSTALLATION: 5/5/15,
- PREVIOUS INSTALLATION: 6/7/13
- PUMP SN: 1265125
- MOTOR SN: 100775001

PUMP NO. 2 (MIDDLE SLOT):
- NEW PUMP AND MOTOR.
- DATE OF LAST INSTALLATION: 5/7/15,
- PREVIOUS INSTALLATION N/A
- PUMP SN: 4350860
- MOTOR SN: 1503MTS00795-1/M

PUMP NO. 3 (WESTERN SLOT)
- WAS PREVIOUSLY PUMP NO. 2
- DATE OF LAST INSTALLATION: 5/15/15,
- PREVIOUSLY INSTALLATION 5/20/14
- PUMP SN: 083768
- MOTOR SN: 1310MTS00693-1/M

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RECORD DRAWINGS PREPARED ON: 7/20/2015

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Texas Registered Engineering Firm F-2144

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Web - www.freese.com

EXELON GENERATING COMPANY, LLC
EXELON WOLF HOLLOW GENERATING STATION
GENERAL
GENERAL NOTES

FN JOB NO. EPT14311
DATE 8/29/14
DESIGNED RP
DRAWN BH
PLOTTED 7/20/15
CHECKED AH
FILE NAME CV-ALL-GN-NOTES.DWG

△ RECORD DRAWINGS BH 7/20/15

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SEQ. 2

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0 500' 1000'
SCALE IN FEET

NORTH

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SEQ: 3

SHEET G-3

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EXELON GENERATING COMPANY, LLC

EXELON WOLF HOLLOW GENERATING STATION

GENERAL

ACCESS MAP

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APPENDIX 1

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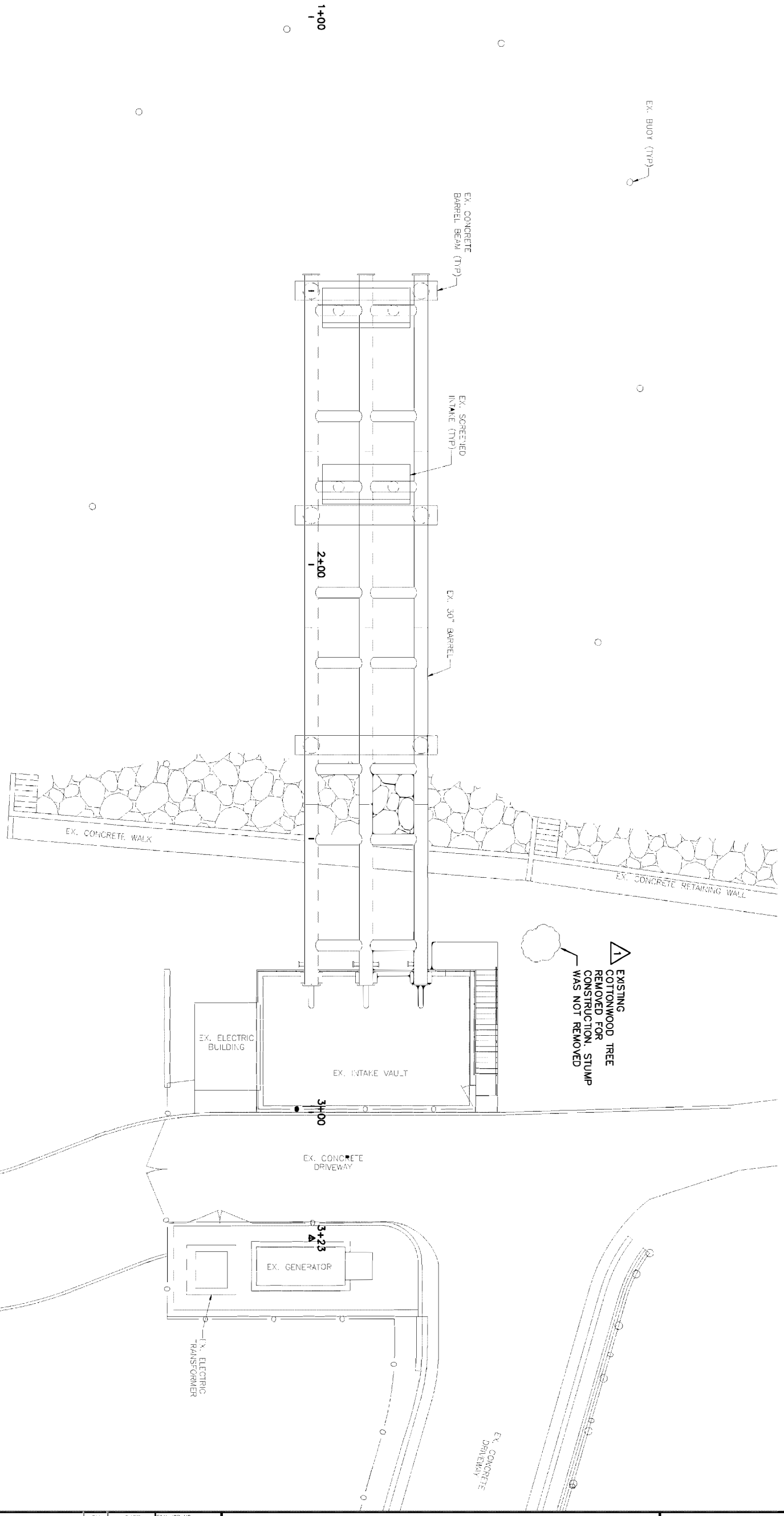

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EXELON GENERATING COMPANY, LLC

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CIVIL

SITE PLAN

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S.O. 4

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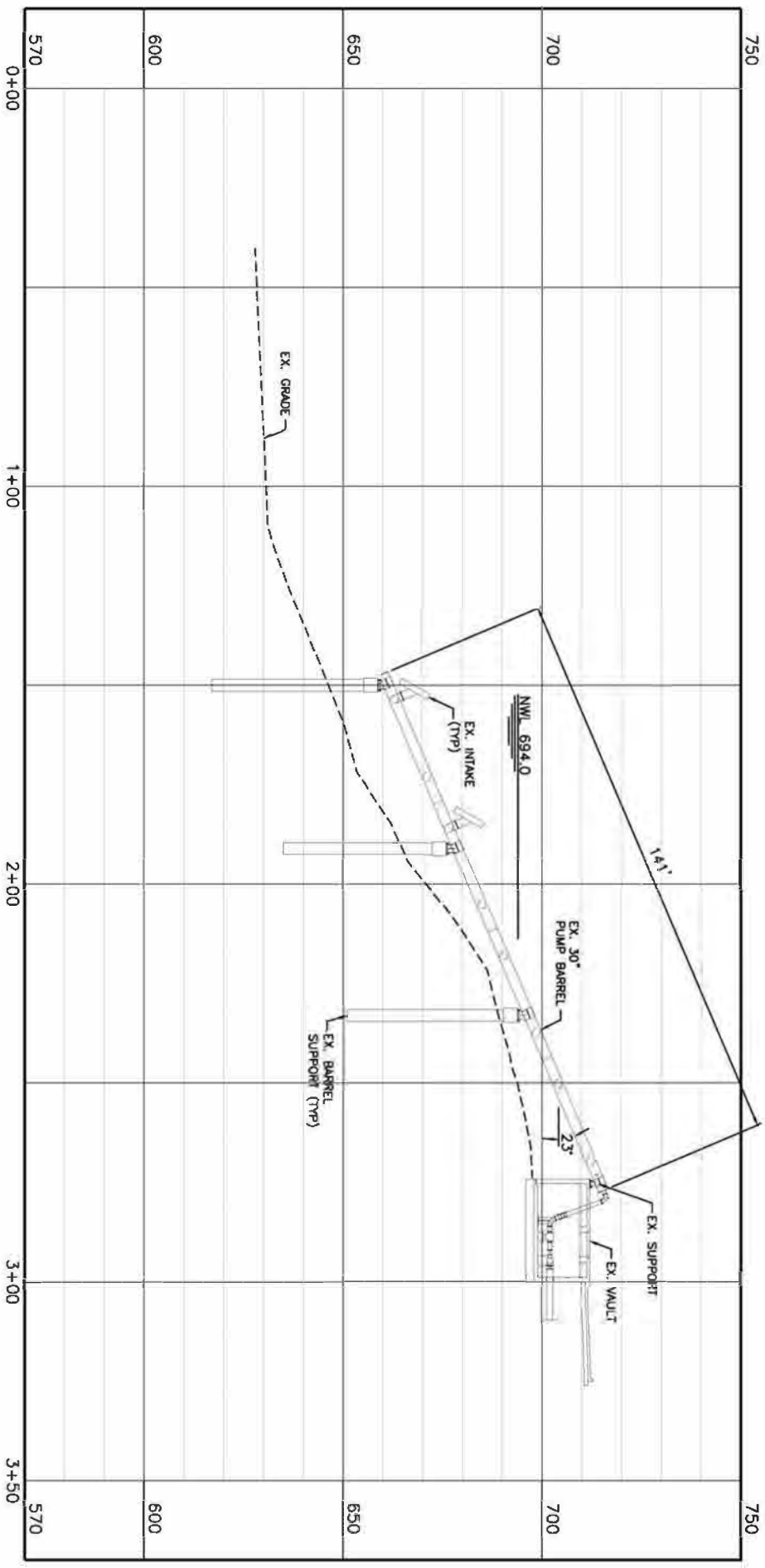

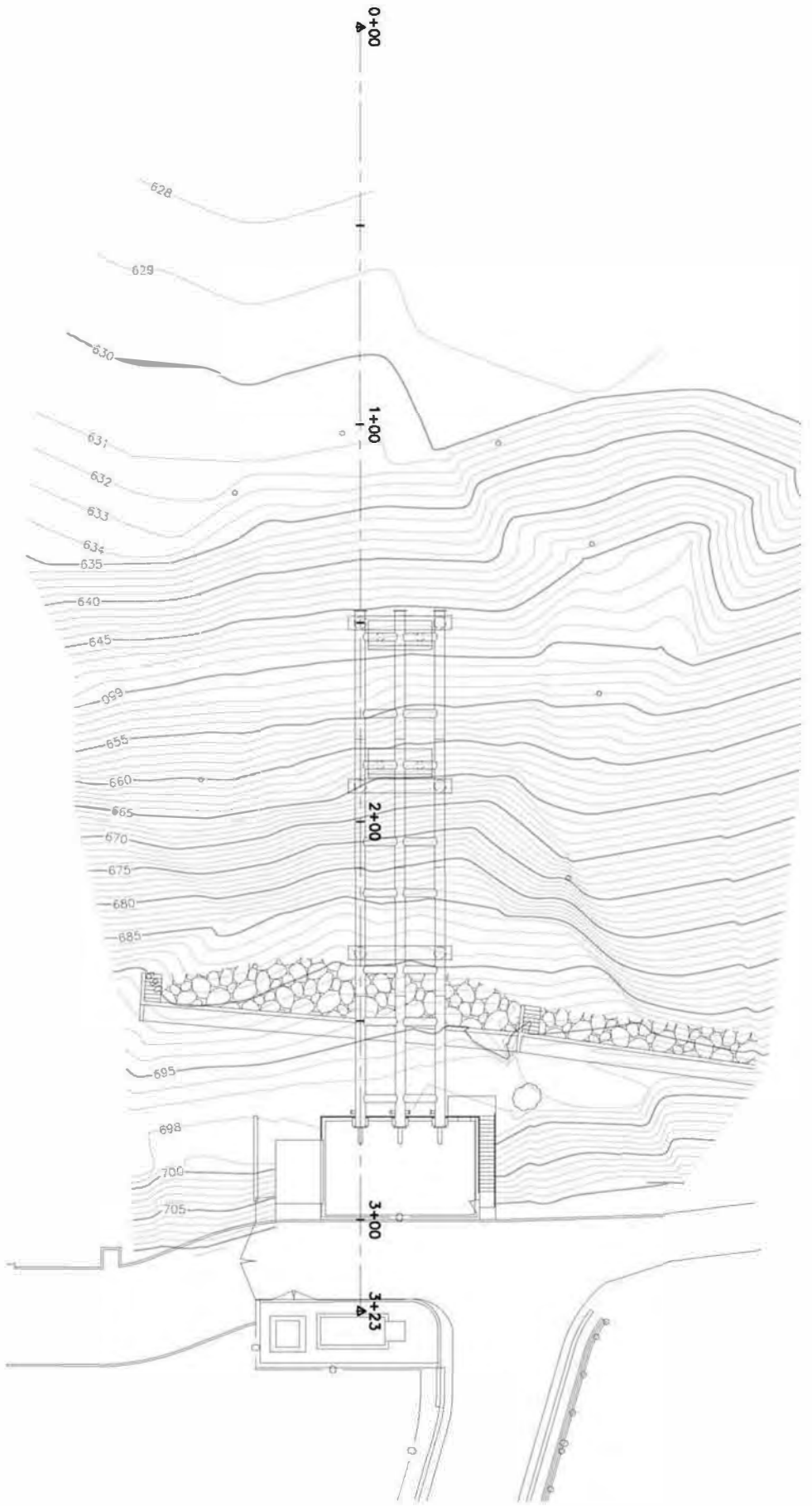

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SCALE IN FEET HORIZONTAL: 0, 10', 20', 40'

NORTH

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EXELON GENERATING COMPANY, LLC

EXELON WOLF HOLLOW GENERATING STATION

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EXISTING PLAN AND PROFILE

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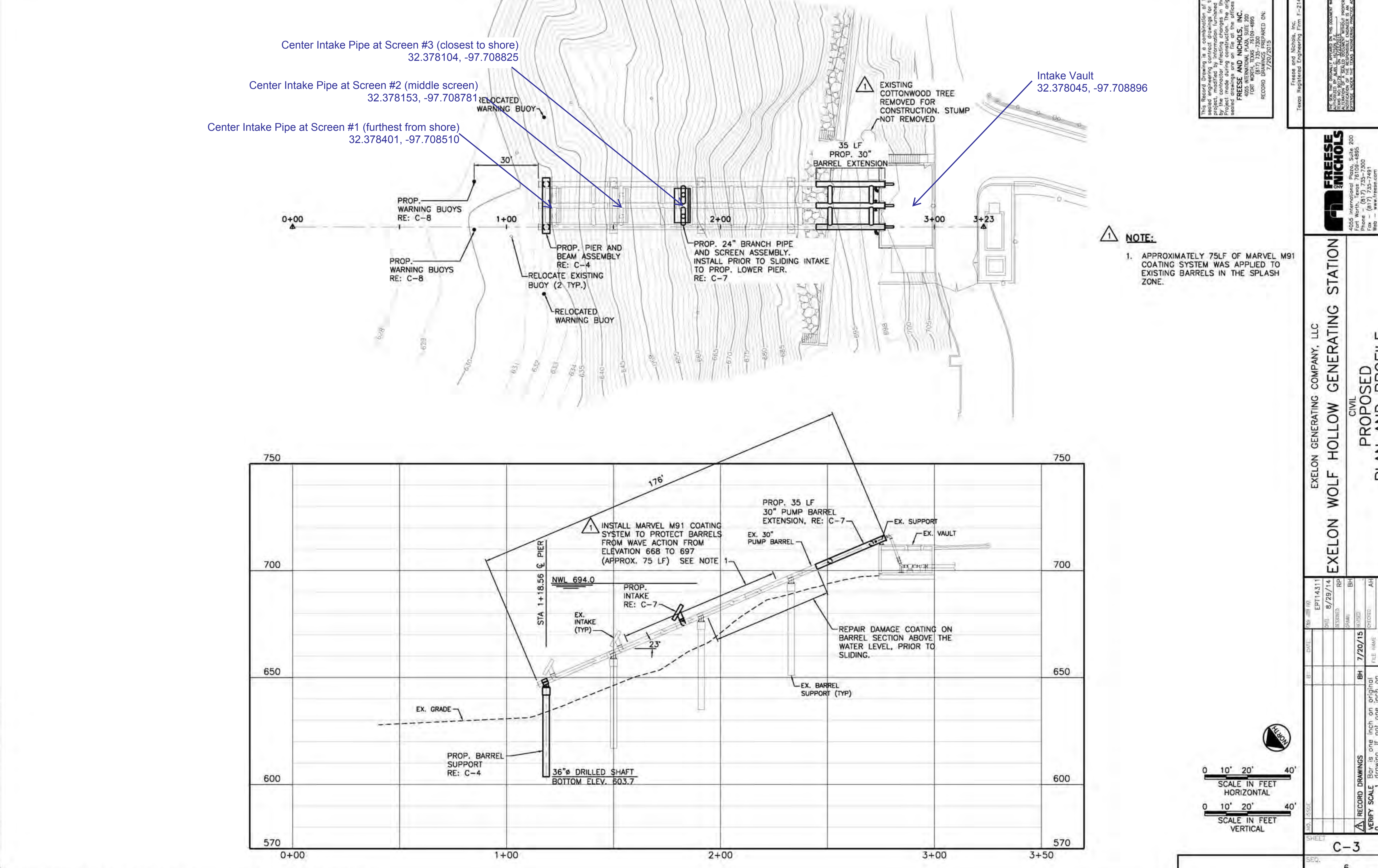
APPENDIX 1



Center Intake Pipe at Screen #3 (closest to shore)
32.378104, -97.708825
Center Intake Pipe at Screen #2 (middle screen)
32.378153, -97.708781
Center Intake Pipe at Screen #1 (furthest from shore)
32.378401, -97.708510
Intake Vault
32.378045, -97.708896
RELOCATED WARNING BUOY
EXISTING COTTONWOOD TREE REMOVED FOR CONSTRUCTION. STUMP NOT REMOVED
35 LF PROP. 30" BARREL EXTENSION
30'
PROP. WARNING BUOYS RE: C-8
PROP. PIER AND BEAM ASSEMBLY RE: C-4
PROP. 24" BRANCH PIPE AND SCREEN ASSEMBLY. INSTALL PRIOR TO SLIDING INTAKE TO PROP. LOWER PIER. RE: C-7
RELOCATE EXISTING BUOY (2 TYP.)
RELOCATED WARNING BUOY
0+00
1+00
2+00
3+00
3+23
NOTE:
1. APPROXIMATELY 75LF OF MARVEL M91 COATING SYSTEM WAS APPLIED TO EXISTING BARRELS IN THE SPLASH ZONE.
176'
INSTALL MARVEL M91 COATING SYSTEM TO PROTECT BARRELS FROM WAVE ACTION FROM ELEVATION 668 TO 697 (APPROX. 75 LF) SEE NOTE 1
STA 1+18.56 ℄ PIER
NWL 694.0
PROP. INTAKE RE: C-7
EX. INTAKE (TYP)
23'
PROP. 35 LF 30" PUMP BARREL EXTENSION, RE: C-7
EX. 30" PUMP BARREL
EX. SUPPORT
EX. VAULT
REPAIR DAMAGE COATING ON BARREL SECTION ABOVE THE WATER LEVEL, PRIOR TO SLIDING.
EX. BARREL SUPPORT (TYP)
EX. GRADE
PROP. BARREL SUPPORT RE: C-4
36"ø DRILLED SHAFT BOTTOM ELEV. 603.7
750
700
650
600
570
0+00
1+00
2+00
3+00
3+50
SCALE IN FEET HORIZONTAL
SCALE IN FEET VERTICAL
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PROPOSED PLAN AND PROFILE
EPT14311
8/28/14
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CV-ALL-PP-SITE02.dwg
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C-3
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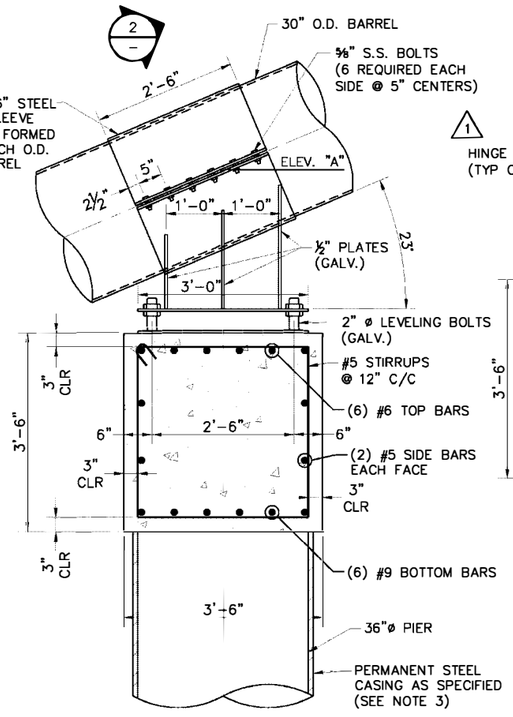

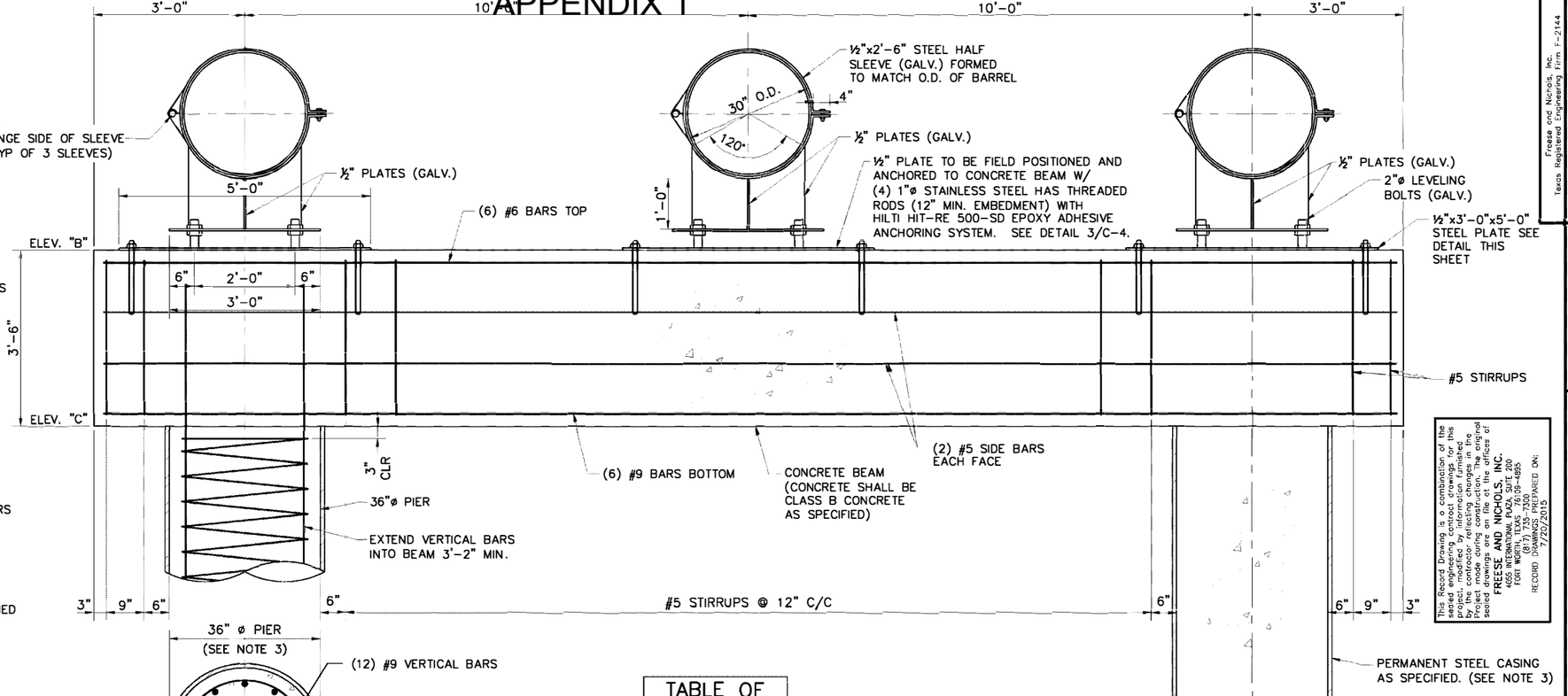

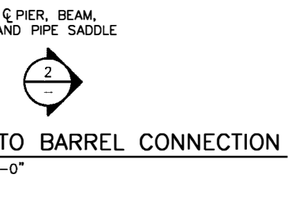

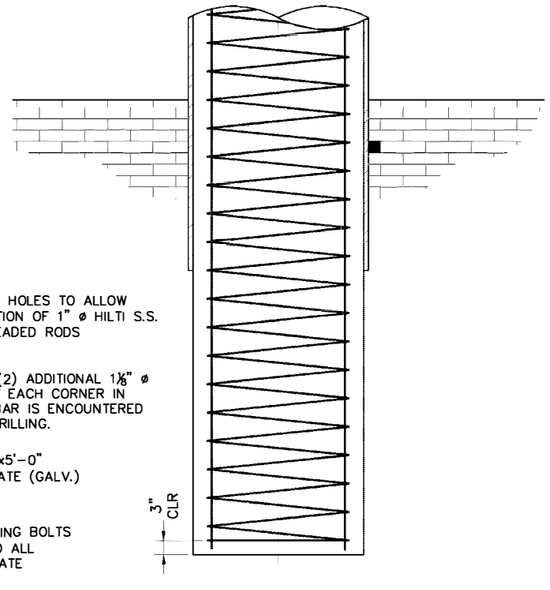

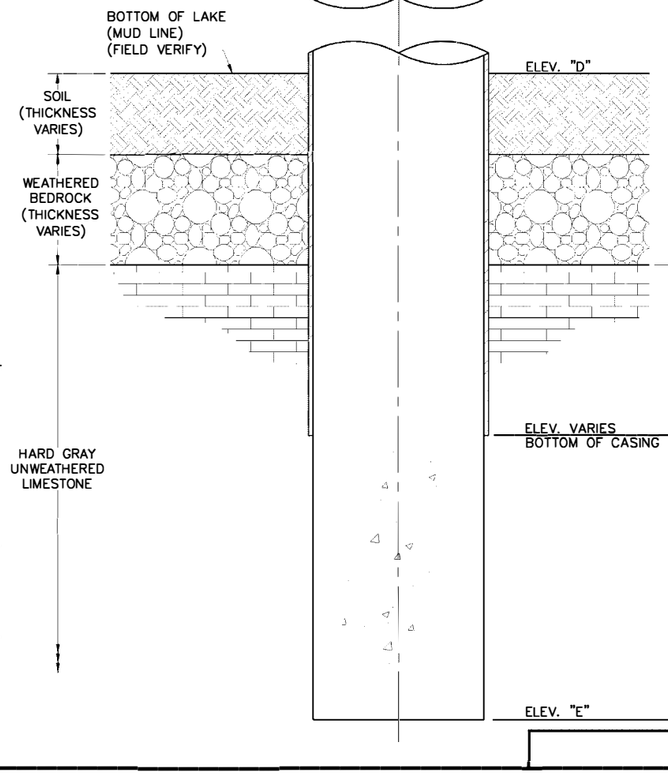

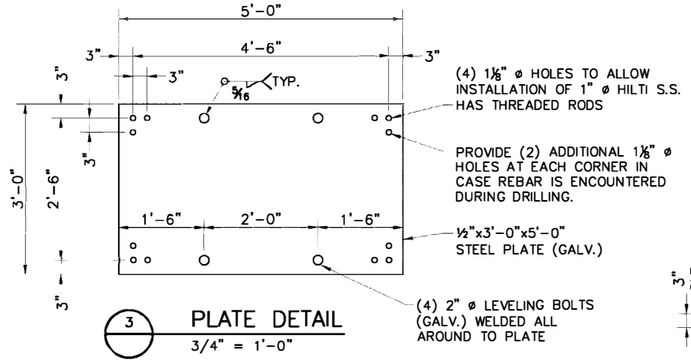

APPENDIX 1

1 BEAM TO BARREL CONNECTION

3/4" = 1'-0"

TABLE OF ELEVATIONS	
ELEV.	℄ PIER @ STA. 1+18.56
A	647.9
B	645.0
C	641.5
D	633.7±
E	603.7±

NOTES:

1. STEEL PLATE, LEVELING BOLTS, AND PIPE SADDLE SHALL BE PROVIDED BY CONTRACTOR.
2. COORDINATE SADDLES WITH PUMP MANUFACTURER.
3. PERMANENT STEEL CASINGS ARE REQUIRED. THE DIAMETER OF THE CASING SHALL NOT REDUCE THE SPECIFIED DRILLED SHAFT DIAMETER BY MORE THAN 2". CASINGS SHOULD BE EXTENDED ABOVE WATER LEVEL AND, AFTER CONCRETE IS PLACED INTO DRILLED SHAFTS AND CURED, CUT OFF AT THE BOTTOM OF CONCRETE BEAM.
4. FORMS FOR CONCRETE BEAM SHALL BE BUILT WATER TIGHT WITH ONLY TOP OPEN FOR CONCRETE PLACING. STEEL FORMS WERE LEFT IN PLACE. 1
5. ELEVATIONS D AND E ARE ASSUMED FOR BIDDING PURPOSES. ENGINEER WILL DETERMINE THE ELEVATION OF THE HARD GRAY UNWEATHERED LIMESTONE FROM THE TEST BORING AND OBSERVATION OF SHAFT DRILLING AND SHALL INDICATE THE REQUIRED PIER TIP ELEVATION (ELEVATION E).
6. PROVIDE FOUR 2" ø SCHEDULE 40 STANDARD PIPES, EQUALLY SPACED AROUND INSIDE OF CAGE. PROVIDE A MINIMUM OF 2" CLEAR BETWEEN PIPES AND VERTICAL REINFORCING BARS.

2 SECTION

3/4" = 1'-0"

3 PLATE DETAIL

3/4" = 1'-0"

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7/20/2015

EXELON GENERATING COMPANY, LLC
EXELON WOLF HOLLOW GENERATING STATION
CIVIL
BARREL BEAM CONNECTION DETAILS

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SEQ. 7

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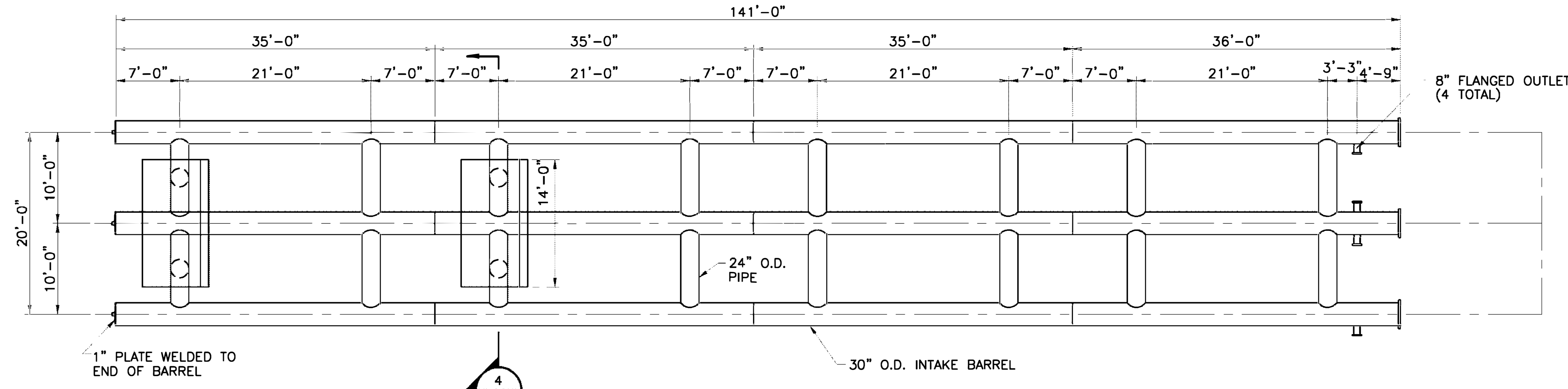
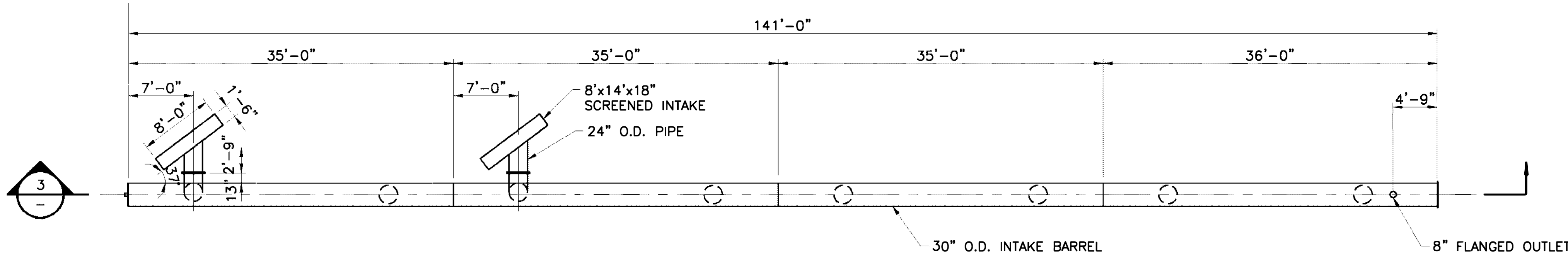
APPENDIX 1

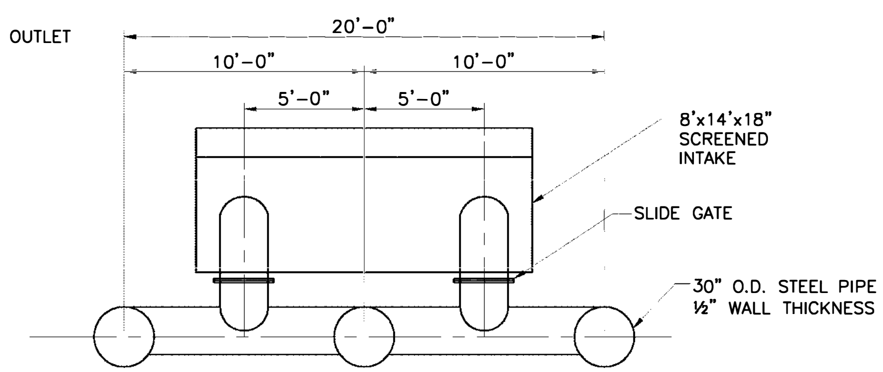


1 PLAN – EXISTING INTAKE BARREL LAYOUT
1/8" = 1'-0"

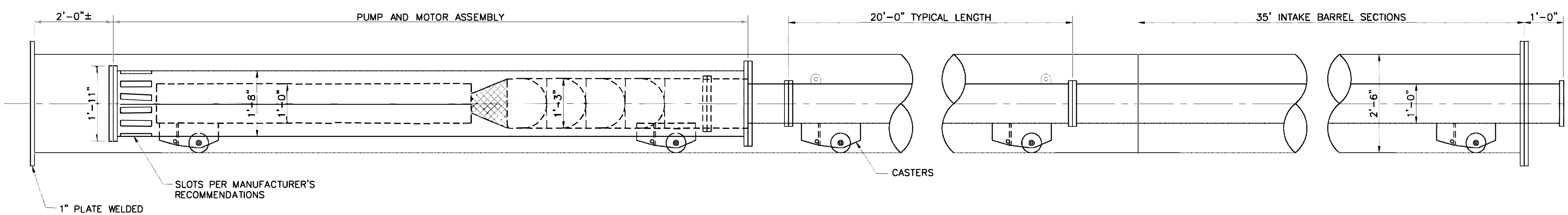


2 EXISTING INTAKE BARREL ELEVATION
1/8" = 1'-0"

NOTES:
1. INTAKE BARREL AND PUMPING UNIT WAS MANUFACTURED BY SMITH PUMP COMPANY.
2. EXISTING INTAKE BARREL IS 30" O.D. STEEL PIPE WITH 0.50" WALL THICKNESS.
3. PUMP COLUMN PIPE IS 12" I.D. AWWA C-210, EPOXY COATED STEEL PIPE RATED FOR 200 P.S.I. WITH 0.375" STEEL WALL THICKNESS. CASTERS ARE ATTACHED TO THE COLUMN TO ALLOW COLUMN TO ROLL IN AND OUT OF THE INTAKE TUBE.
4. EACH SCREENED INLET HAS A SLIDE GATE WITH 1/4" WIRE CABLE THAT ALLOWS STATION OPERATOR TO OPEN AND CLOSE EACH INLET FROM INSIDE THE VALVE VAULT. WIRE CABLES ARE ENCLOSED IN 2"ø GALVANIZED PIPES FROM ELEVATION 685 TO VALVE VAULT.
5. ALL BOLTS AND FASTENERS ARE STAINLESS STEEL UNLESS OTHERWISE NOTED.
6. BARREL CONNECTORS AND SLIDE GATE ASSEMBLY NOT SHOWN FOR CLARITY. DETAILS TO BE PROVIDED AT PRE-CONSTRUCTION MEETING.



4 SECTION
1/4" = 1'-0"



3 EXISTING INTAKE BARREL LONGITUDINAL SECTION
3/4" = 1'-0"

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EXELON GENERATING COMPANY, LLC
EXELON WOLF HOLLOW GENERATING STATION
CIVIL
EXISTING INTAKE BARREL
PLAN, ELEVATION, AND SECTIONS

EPT14311
8/29/14
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CV-ALL-DT-TYPL02.DWG
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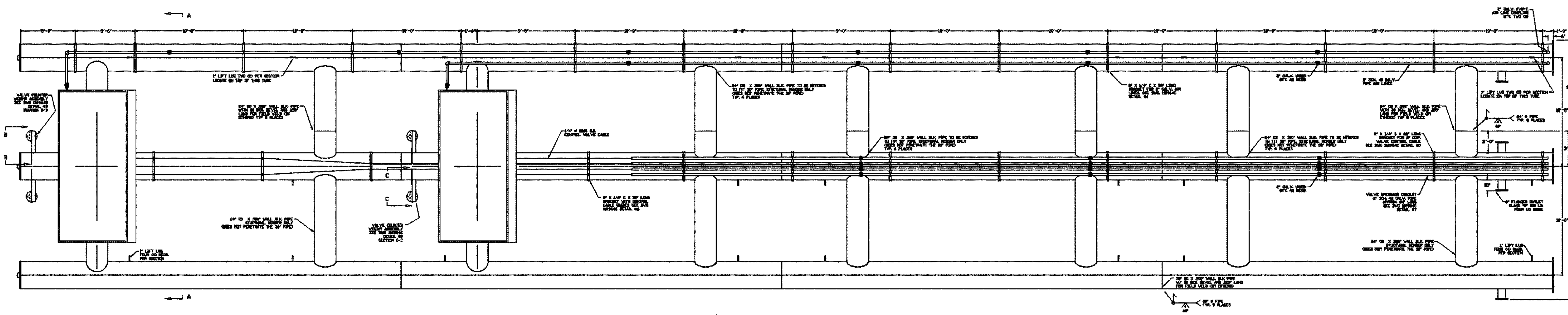
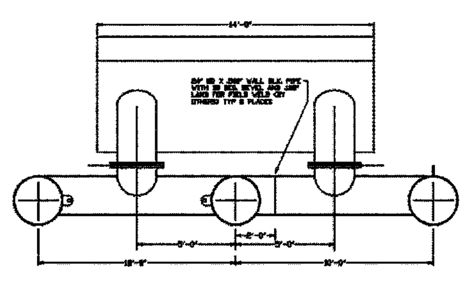
TRIPLEX RAW WATER INTAKE STRUCTURE GENERAL ARRANGEMENT

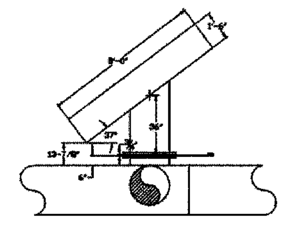
TOP VIEW



SECTION A-A

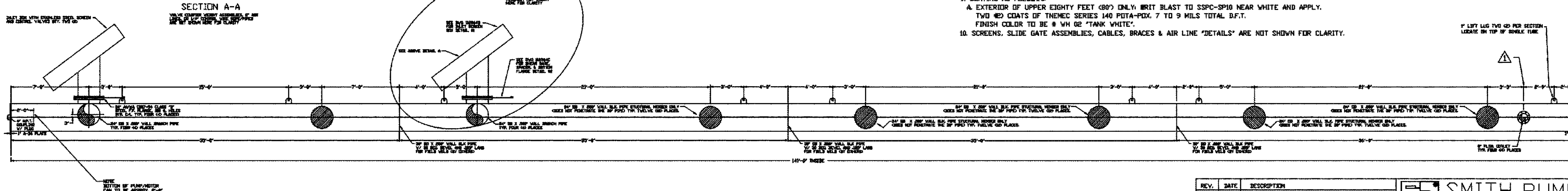


DETAIL A



NOTES

1. STRUCTURE TO BE IN EIGHT (8) MAJOR SECTIONS AS FOLLOWS:
   A. THREE (3) TWO (2) TUBE SECTIONS 35'-0" LONG.
   B. THREE (3) SINGLE TUBE SECTIONS 35'-0" LONG.
   C. ONE (1) UPPER TWO (2) TUBE SECTION 36'-0" LONG. HEAVIEST PIECE 14,500 LBS. EST. WT.
   D. ONE (1) UPPER SINGLE TUBE SECTION 36'-0" LONG. 8,500 LBS. EST. WT.
   E. TWO (2) 8'-0" X 14'-0" X 1'-6" INLET SCREEN BOXES 4,000 LBS. EST. WT. PER EACH.
2. ALL BRACKETS, STRUCTURAL PIPES, BRANCH PIPES, FLANGES, LIFTING LUGS, COUPLINGS, AND ETC. TO BE SEAL WELDED ALL AROUND.
3. ALL WELDS TO BE CLEAN AND FREE OF SPLATTER, SHOT, AND SLAG.
4. ALL 24" X .500 WALL BLACK PIPE TO BE API 5 L.
5. ALL 30" X .500 WALL BLACK PIPE TO BE API 5 L.
6. THE 30" AND 24" PIPES TO HAVE 30 DEG. BEVEL WITH .125" LAND ON THE ENDS SHOWN FOR FIELD WELDING "BY OTHERS".
7. THE SINGLE TUBE 24" PIPE BRANCHES & STRUCTURE SUPPORTS TO BE 90 DEG. BUTT JOINT TO MATCH THE 24" PIPES ON THE DOUBLE TUBES. FIELD WELDING "BY OTHERS".
8. FASTNERS TO BE 18-8 S.S., 304 S.S. OR HOT DIP GALV.
9. COATING AS FOLLOWS:
   A. EXTERIOR OF UPPER EIGHTY FEET (80') ONLY: GRIT BLAST TO SSPC-SP10 NEAR WHITE AND APPLY. TWO (2) COATS OF TNEMEC SERIES 140 POTA-POX, 7 TO 9 MILS TOTAL D.F.T. FINISH COLOR TO BE # WH 02 "TANK WHITE".
10. SCREENS, SLIDE GATE ASSEMBLIES, CABLES, BRACES & AIR LINE "DETAILS" ARE NOT SHOWN FOR CLARITY.



SIDE VIEW

REV.	DATE	DESCRIPTION
1		1. CHANGE 8" FLGD. OUTLET TO 4'-9" FROM END IN LIEU OF 4'-0"

SMITH PUMP COMPANY
PRODUCT RAW WATER INTAKE STRUCTURE
PROJECT AES WOLF HOLLOW POWER PLANT
LAKE GRANBURY INTAKE PUMP STRUCTURE
PARSONS ENERGY & CHEMICAL GROUP INC.
DRAWING NO. 112964

DATE	SCALE	DWN BY	CHK BY
04-05-2001	NONE	JW	LGS

FREESE NICHOLS
4055 International Plaza, Suite 200
Fort Worth, Texas 76109-4895
Phone - (817) 735-7300
Fax - (817) 735-7491
Web - www.freese.com

EXELON GENERATING COMPANY, LLC
EXELON WOLF HOLLOW GENERATING STATION
CIVIL
BARREL AS-BUILT
PLAN AND SIDE VIEWS

FN JOB NO. EPT14311
DATE 8/29/14
DESIGNED RP
DRAWN BH
CHECKED AH
FILE NAME CV-ALL-DT-TYPL04.DWG

BH 7/20/15 RECORD DRAWINGS

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-6
SEQ. 9

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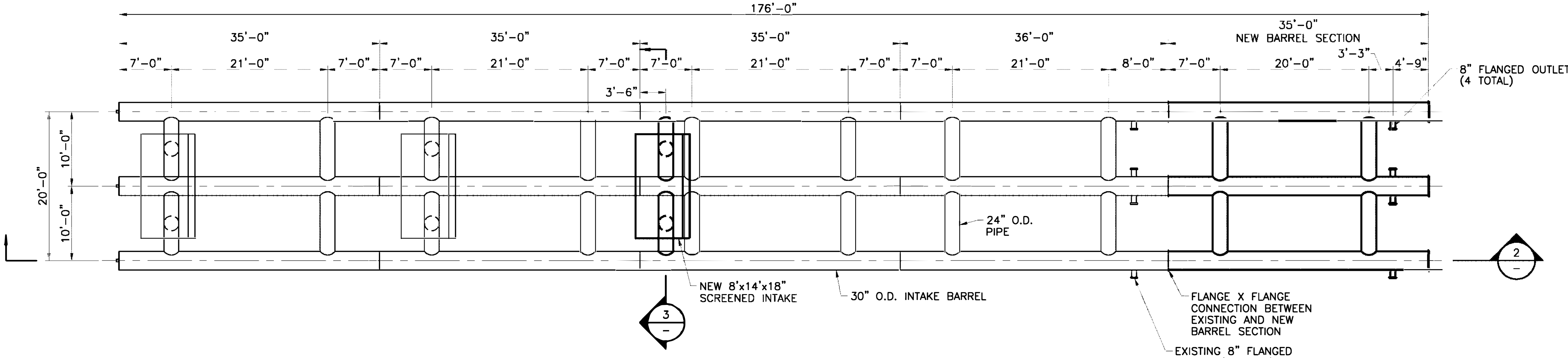
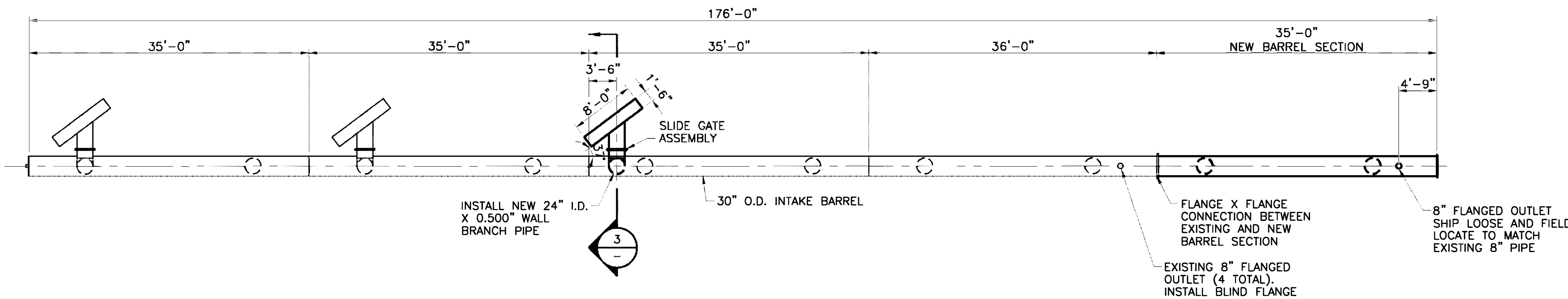
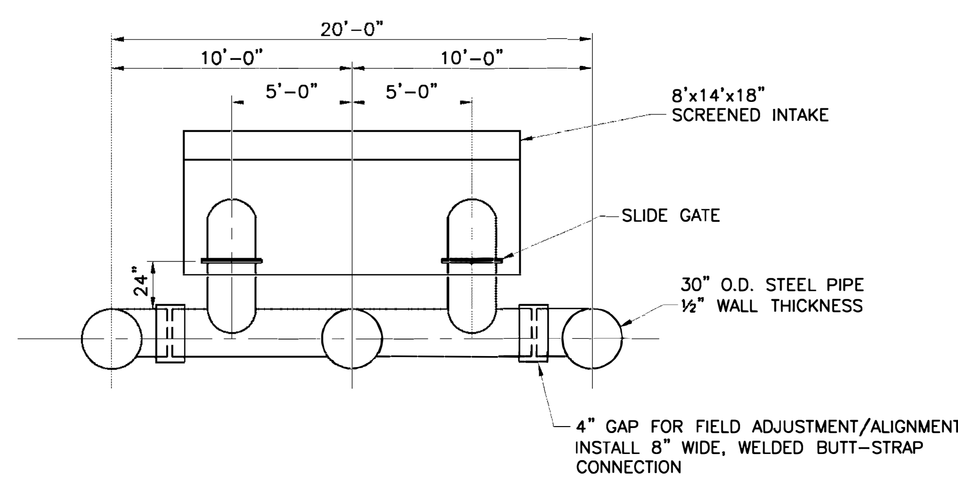
APPENDIX 1



1 PLAN – INTAKE BARREL LAYOUT
1/8" = 1'-0"





3 SECTION (UPPER INTAKE)
1/4" = 1'-0"

INSTALLATION NOTES:
1. INSTALLED NEW CATHODIC PROTECTION SYSTEM ANODES AND CABLING SUPPLIED BY EXELON.
2. AIR BURST PIPING WAS INSTALLED FOR ALL INTAKE SCREENS.

This Record Drawing is a combination of the sealed engineering contract drawings for this project, modified by information furnished by the contractor reflecting changes in the Project made during construction. The original sealed drawings are on file at the offices of FREESE AND NICHOLS, INC. 4055 INTERNATIONAL PLAZA, SUITE 200 FORT WORTH, TEXAS 76109-4895 (817) 735-7300 RECORD DRAWINGS PREPARED ON: 7/20/2015

Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144

FREESE NICHOLS
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Web - www.freese.com

EXELON GENERATING COMPANY, LLC
EXELON WOLF HOLLOW GENERATING STATION
CIVIL
PROPOSED INTAKE BARREL
PLAN, ELEVATION, AND SECTION

EPT14311
8/29/14
RP
BH
AH
RECORD DRAWINGS BH 7/20/15
CV-ALL-DT-TYPL03.DWG
VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-7
SEQ. 10

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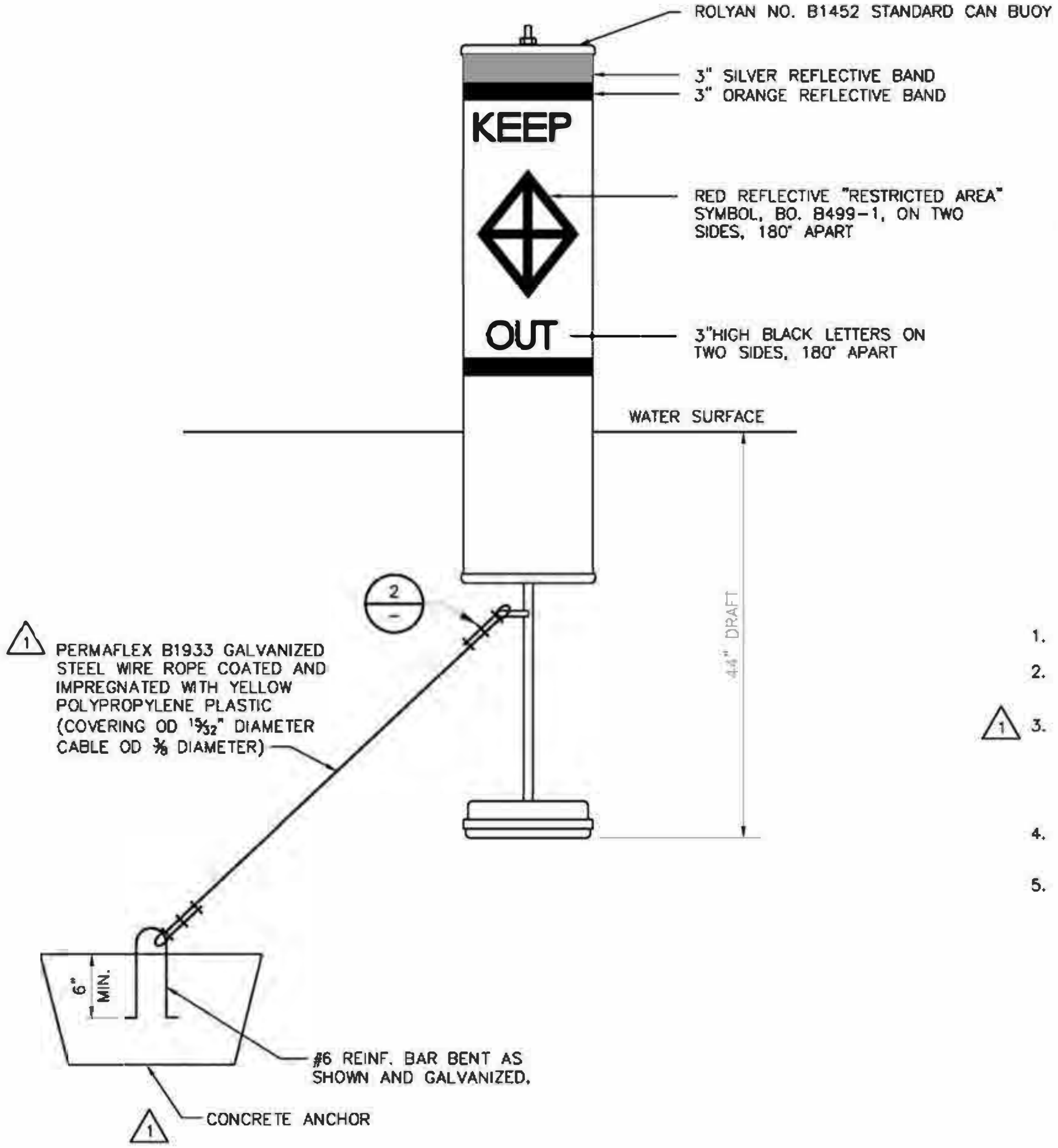
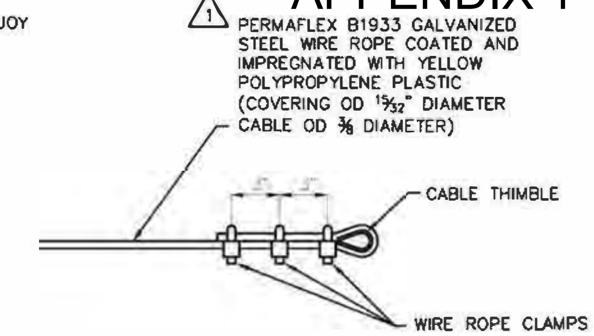


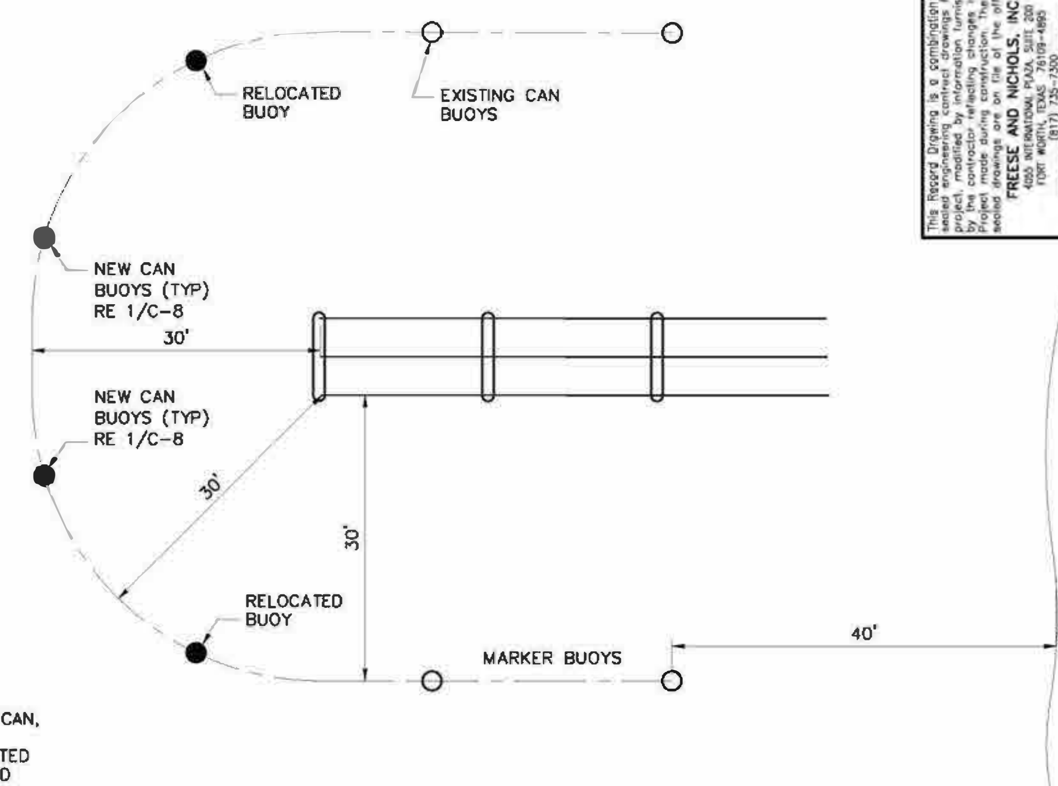
1 / C-1 TYPICAL BUOY INSTALLATION
NOT TO SCALE



2 / – TIE DETAIL
NOT TO SCALE

NOTES

1. ALL HARDWARE SHALL BE HOT DIP GALVANIZED.
2. FOLLOWING INSTALLATION OF SHACKLES, SHACKLE PINS SHALL BE PEENED TO PREVENT REMOVAL.
3. REGULATORY MARKER BUOYS SHALL BE ROLYAN NO. B1452 STANDARD CAN, WHITE, WITH MARKINGS SHOWN, OR APPROVED EQUAL, AND SHALL BE ANCHORED WITH PERMAFLEX B1933 GALVANIZED STEEL WIRE ROPE COATED AND IMPREGNATED WITH YELLOW POLYPROPYLENE PLASTIC (COVERING OD 15/32" DIAMETER CABLE OD 3/8" DIAMETER)
4. MARKER BUOYS SHALL BE INSTALLED TO ALLOW THEM TO FLOAT NEAR VERTICAL FROM ELEVATION 680 TO 700.
5. MARKER BUOYS SHALL BE ANCHORED WITH A CONCRETE ANCHOR.



3 / – SCHEMATIC PLAN
NOT TO SCALE

This Record Drawing is a combination of the sealed engineering contract drawings for this project, modified by information furnished by the contractor reflecting changes in the Project made during construction. The original sealed drawings are on file at the offices of FREESE AND NICHOLS, INC. 4055 INTERNATIONAL PLAZA, SUITE 200, FORT WORTH, TEXAS 76109-4895. RECORD DRAWINGS PREPARED ON: 7/20/2015

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Web – www.freese.com

EXELON GENERATING COMPANY, LLC
EXELON WOLF HOLLOW GENERATING STATION
CIVIL
BUOY DETAILS

FNI JOB NO. EPT14311
DATE 8/29/14
DESIGNED RP
DRAWN BH
CHECKED AH
RECORD DRAWINGS BH 7/20/15
FILE NAME CV-ALL-DT-TYPL05.DWG

VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-8
SEQ. 11

Appendix 2. 2021 Granbury Reservoir Fisheries Report

APPENDIX 2

Granbury Reservoir

2021 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-4

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

Prepared by:

John Tibbs, District Management Supervisor
and
Michael S. Baird, Assistant District Management Supervisor

Inland Fisheries Division
Waco District, Waco, Texas

Carter Smith
Executive Director

Craig Bonds
Director, Inland Fisheries

July 31, 2022

Contents

Survey and Management Summary

Fish populations in Granbury Reservoir were surveyed in 2021 using electrofishing and in 2022 using gill netting. Historical data are presented with the 2021-2022 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

Reservoir Description: Granbury Reservoir is an 8,700-acre impoundment located near the City of Granbury, Hood County, Texas and is operated by the Brazos River Authority (BRA). Primary water uses include storage of flood and storm waters, municipal water supply, power plant cooling, and recreation. Fish habitat at the time of sampling consisted mainly of bulk heading, natural shoreline, boat docks and piers and emergent aquatic vegetation (Giant reed, Cattail and American water willow). Water level averaged one foot below conservation pool during the 2021-2022 vegetation, electrofishing, and gill netting surveys (Figure 2).

Management History: Important sport fish include Largemouth Bass, Channel Catfish, White Bass and Striped Bass. Sport fishes in Granbury Reservoir are currently managed with statewide regulations. In 2013, management efforts began focusing on supporting the statewide public relations campaign “Clean. Drain. Dry” and posting appropriate aquatic invasive species (AIS) signage at access points to try and prevent the spread of zebra mussels into the reservoir. In 2016, the BRA funded a cooperative effort to build and deploy fish attracting structures (i.e., 28 crappie condos and 16 Mossback Safe Haven structures) near mid-reservoir, to begin to enhance fish habitat reservoir wide. The 16-inch minimum length limit on Largemouth Bass was changed back to the statewide, 14-inch minimum length regulation on September 1, 2018, during a statewide effort to simplify Texas Largemouth Bass regulations. Recent management efforts include aquatic vegetation and boater access surveys conducted during summer 2021 and gill netting during spring 2022.

Fish Community

- **Prey species:** Forage species including Threadfin and Gizzard Shad, Bluegill, Longear Sunfish and Redear Sunfish, were present in the reservoir in low to moderate abundance. Nearly half of the Gizzard Shad were available as prey to predators.
- **Catfishes:** Channel Catfish were abundant and body condition improved with increasing size; most were of legal length. Blue Catfish and Flathead Catfish were present in low numbers.
- **Temperate basses:** White Bass were available and body condition was good across length classes; most were of legal length. Striped Bass catch improved and body condition across all length classes was excellent. Most of the Striped Bass observed were of legal length also.
- **Largemouth Bass:** Largemouth Bass were collected in below average numbers and body condition varied greatly among length classes. Good percentages of legal fish were still available to anglers yet young of the year fish made up a large proportion of the population.
- **White Crappie:** White Crappie were available and most collected fish were of legal length. Body condition was excellent.

Management Strategies: Continue managing Granbury Reservoir with existing regulations. Conduct monitoring surveys with fall electrofishing in 2025 and spring trap netting and gill netting surveys in 2026 (Table 8). Conduct aquatic vegetation and access surveys in late summer 2025 (Table 8). Continue efforts to educate the public about AIS issues and protect the reservoir from zebra mussel introductions. Continue stocking Striped Bass annually and coordinate with the BRA on future artificial habitat projects pending funding and reservoir priorities.

Introduction

This document is a summary of fisheries data collected from Granbury Reservoir in 2021-2022. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2021-2022 data for comparison.

Reservoir Description

Granbury Reservoir is an 8,700-acre impoundment located near the City of Granbury, Hood County, Texas and is operated by the Brazos River Authority (BRA). Primary water uses include storage of flood and storm waters, municipal water supply, power plant cooling, and recreation. Granbury Reservoir is eutrophic with a mean and maximum depth of 18.0 and 75.0 feet respectively. Descriptive characteristics for Granbury Reservoir can be found in Table 1. Fish habitat at the time of sampling consisted mainly of bulk heading, natural shoreline, boat docks and piers and emergent aquatic vegetation. Littoral vegetation was dominated by stands of giant reed (*Arundo donax*), cattail (t*ypha spp*.), and American water-willow (*Justicia americana*). Conservation pool elevation is 693 feet above mean sea level [MSL]. Water level remains nearly constant and has been within one foot of conservation since summer 2018 (Figure 1). Water level averaged one foot below conservation pool during the 2021-2022 vegetation, electrofishing and gill netting surveys (Figure 2).

Angler Access

Boat access on Granbury Reservoir was adequate and consisted of five public boat ramps and many private ramps. Recent BRA efforts to extend and widen public boat ramps have greatly improved public access during drought periods however, four of the five public boat ramps still aren't useable when the reservoir level drops to 10 feet below conservation pool. Four fishing piers were available to bank anglers: Hunter Park, Hewlett Park, Rough Creek Park and DeCordova Bend Park. See Table 2 for additional boat ramp characteristics.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Baird and Tibbs 2018) included:

1. Using trap nets to sample White Crappie on Granbury during 2022 and compare the data with winter trap netting and spring gill netting data sets.

   Action: This comparison was devised during the last Granbury report writing, however identical comparisons in two other district reservoirs have been completed since 2018, bringing the total to three district reservoirs (Granbury in 2017/2018, Fort Parker State Park Lake in 2018/2019, and Limestone Reservoir in 2020/2021) where crappie collecting gear types and seasons were compared. Because data have already been collected for this comparison on three different reservoirs, trap netting comparisons scheduled for Granbury during 2021 and 2022 were not performed. The decision to use spring trap netting for all future district crappie surveys has already been made.

2. Collecting a category 3 age and growth sample for Striped Bass in 2022.

   Action: This category 3 age and growth sample was not completed in 2022 but will be re-scheduled for 2024.

3. Working with the BRA to use dedicated habitat funding to install new artificial fish reefs throughout the reservoir

   Action: The BRA has dedicated funds for another artificial habitat project on Granbury which will happen in late summer or fall 2022. This project will be a partnership with the

TPWD Wildlife Division, Inland Fisheries and BRA, and will benefit prey and sport fishes alike as well as the Brazos River Water Snake.

4. Cooperating with the BRA to maintain appropriate AIS signage at access points around the reservoir and ensure that USACE staff and marina owners are aware of the AIS threats and have information to provide to their customers.

   Action: New AIS signage was posted at Granbury Reservoir boat ramps during 2013 to remind constituents of the dangers of AIS, and signage has been maintained ever since. District staff have made a speaking point about AIS and zebra mussels, how to prevent their spread, and potential effects on other Texas Reservoirs while speaking to constituents during conversations and presentations also.

Harvest regulation history: Sport fishes in Granbury Reservoir are currently managed with statewide regulations. The 16-inch minimum length limit on Largemouth Bass was changed back to the statewide, 14-inch minimum length regulation on September 1, 2018, during a statewide effort to simplify Texas Largemouth Bass regulations. Also, the statewide catfish regulation, 25 fish bag (Channel and Blue Catfish, in any combination), 12-inch minimum length limit, was replaced on September 1, 2021, with a 25 fish bag (Channel and Blue Catfish, in any combination – only 10 can be 20 inches or greater in length), and no minimum length limit. Current regulations are found in Table 3.

Stocking history: Striped Bass fingerlings have been stocked nearly annually at 5 to 15/acre since 1972. Contemporary stockings of this species have used fry to supplement fingerling stockings, based on recent Palmetto Bass research comparing fry and fingerling stocking success in Belton Reservoir (Tibbs and Baird 2015). Florida Largemouth Bass were stocked in 2008, 2017 and 2018 to mitigate cumulative losses from fish kills associated with golden algae and to increase Florida genetics in the population. The complete stocking history is in Table 4.

Water transfer: Granbury Reservoir is primarily used for storage of flood and storm waters, municipal water supply, power plant cooling, and recreation. There are currently two major pumping stations on the reservoir which transfer water to other sites. The first is operated by Luminant, which uses untreated water from Granbury for nuclear power plant operations on Squaw Creek Reservoir. The other is operated by the Authority's Lake Granbury Surface Water and Treatment System (SWATS), which supplies treated water to several municipalities in Hood and Johnson Counties. No additional diversions are known at this time.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Granbury Reservoir (Baird and Tibbs 2018). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad and Threadfin Shad were collected by daytime electrofishing (1.25 h at 15, 5-min stations). The 2021 survey is the second daytime electrofishing survey completed on Granbury Reservoir. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Gill netting –Catfishes, White Bass, Striped Bass and White Crappie were collected by gill netting (10 net nights at 10 stations). Catch per unit effort for gill netting was recorded as the number of fish caught per net night (fish/nn).

Genetics – Genetic analysis of Largemouth Bass was not conducted during this survey period; refer to Baird and Tibbs (2018) for the most recent genetics information collected.

Statistics – Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

Habitat – A structural habitat survey was not conducted during this survey period; refer to Baird and Tibbs (2010) for the most recent structural habitat information collected. Vegetation surveys were conducted using an adaptation of the point method in 2017 and 2021 (TPWD, Inland Fisheries Division, unpublished manual revised 2015). One hundred and sixty-eight points were randomly generated on the shoreline. A transect was made from each point out to deep water, and all encountered vegetation on that transect was recorded. Refer to Baird and Tibbs (2014) for prior vegetation coverage.

Water level – Source for water level data was the United States Geological Survey (USGS 2022).

Results and Discussion

Habitat: Littoral zone structural habitat consisted primarily of bulk heading, natural shoreline, boat docks and piers and emergent aquatic vegetation. Cattail was found in 13% of random points sampled, followed by giant reed (11%), American water willow (7%) and Lotus (<1%;Table 6). No problematic species of aquatic vegetation currently exists in the reservoir. Habitat management work began in October 2016 when 28 crappie condos and 16 Mossback Safe Haven structures, funded by BRA, were placed at four sites near mid-reservoir to enhance fish habitat in the reservoir. Maps, additional information, and GPS coordinates can be found on the TPWD website; Fishing>Fisheries Management>Habitat projects>Granbury.

Prey species: Threadfin and Gizzard Shad were collected with daytime electrofishing at 170.4 fish/h and 320.8 fish/h respectively in 2021 (Figure 3; Appendix A). An estimated 47% of the Gizzard Shad population was available to existing predators as forage which was intermediate to the previous two IOV estimates (Figure 3). The catch rate of Bluegill, Longear Sunfish and Redear Sunfish was 37.6 fish/h, 17.6 fish/h and 2.4 fish/h respectively, and these catch rates were on the low side for these prey species (Figure 4; Appendix A). Large panfish were seldom observed.

Catfishes: Channel Catfish were collected with gill nets at a rate of 5.7 fish/nn in 2022 (Figure 5; Appendix A). This is nearly half the previous catch rate, yet the OBS goal for this species, general monitoring to collect abundance (CPUE – Total; RSE ≤ 25) and size structure data (PSD and length-

frequency; N ≥ 50), was still achieved with 57 individuals and an RSE of 22. The PSD (71) slightly decreased from 2018 (80; Figure 5). Individual body condition was good to excellent and improved with increasing length.

Blue Catfish were collected at a rate (2.1 fish/nn) similar to the previous survey (1.5 fish/nn), and Flathead Catfish were collected at an identical rate from both surveys (0.4 fish/nn (Appendix A).

Temperate Basses: White Bass were collected with gill nets at a rate of 2.2 fish/nn in 2022. This was the same catch rate as in 2018 (Figure 6). No abundance (CPUE – Total; RSE ≤ 25) or size structure (PSD and length-frequency; N ≥ 50) objectives were set for this species due to historically low catch rates and only 22 individuals were collected with an RSE = 32. Most of the sampled individuals were legal length. Individual body condition was good (Figure 6).

The gill net catch rate of Striped Bass was 3.4 fish/nn in 2022, up from 2.3 fish/nn in 2018 (Figure 7; Appendix A). No abundance (CPUE – Total; RSE ≤ 25) or size structure (PSD and length-frequency; N ≥ 50) objectives were set for this species due to historically low catch rates however 34 total individuals were collected with an RSE = 29 (Figure 7; Appendix A). Additional gill netting to collect a category 3 age and growth sample for Striped Bass was not completed. This work has been rescheduled to occur in 2024. The population was dominated by individuals in the quality to preferred size classes, and body condition was excellent (Figure 6).

Largemouth Bass: Largemouth Bass were collected by daytime electrofishing at a rate of 31.2 fish/h in 2021. This is lower than both the previous daytime catch rate (52.4 fish/h) and the historical average for the reservoir (Figure 8; Appendix A; Baird and Tibbs 2014). The OBS goal for abundance (CPUE – Stock; RSE ≤ 25) was achieved with an RSE of 22 however, the size structure goal (PSD and length-frequency; N ≥ 50) was not achieved because only 18 individuals of stock-length or greater were collected. The current PSD (83) is higher than that of the previous survey (74), and the current population size structure is dominated by fish spawned in 2021. Individual body condition varied greatly among length classes.

The legal length limit for Largemouth Bass reverted to the statewide 14 inch minimum on September 1, 2018. This was part of a larger statewide effort to simplify Largemouth Bass regulations and remove those which had not demonstrated an effect on the population. No issues with the Largemouth Bass population have been documented since this change. No concerns have been raised by anglers either.

Based on the past five genetic evaluations (2003-2017) and associated stocking efforts during that period, it appears that about 50% introgression of Florida alleles is the best that can be expected for the reservoir. See Baird and Tibbs 2018 for genetic information collected during that time period.

White Crappie: White Crappie were collected with gill nets at a rate of 2.3 fish/nn in 2022 (Figure 9; Appendix A). Because data had previously been collected for a crappie gear/season comparison on three different reservoirs (Granbury in 2017/2018, Fort Parker State Park Lake in 2018/2019, and Limestone Reservoir in 2020/2021), trap netting comparisons scheduled for Granbury during 2021 and 2022 were not performed. All future crappie surveys will be conducted by spring trap netting.

The OBS goal for the gill net survey, general monitoring to collect abundance (CPUE – Stock; RSE ≤ 25) and size structure (PSD and length-frequency; N ≥ 50) data, was not achieved as only 23 individuals were collected; RSE = 32. High percentages of legal length fish were observed, and body condition was excellent.

Black Crappie are still present in the reservoir but were not collected in 2022 gill netting.

Fisheries Management Plan for Granbury Reservoir, Texas

Prepared – July 2022

ISSUE 1: Striped Bass have been a part of the fishery at Granbury Reservoir since the early 1970s, but the most recent age and growth data available for the species was collected in 2002. In addition, the 2018 and 2020 stockings consisted of only fry, and determining the success of that stocking is important to future Striped Bass stocking strategies in the reservoir. This evaluation was not conducted in 2022.

MANAGEMENT STRATEGY

1. Collect a category 3 age and growth sample for Striped Bass in 2024.

ISSUE 2: There has not been a recent angler survey completed on Granbury Reservoir. Quantifying effort for the Largemouth Bass, Catfish, Crappie, and Striped Bass fisheries would yield important information useful to managing the reservoir.

MANAGEMENT STRATEGY

1. Complete a creel survey in spring and fall, 2024.

ISSUE 3: Many AIS threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches, and plugging engine cooling systems. Giant salvinia and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of AIS are significant. Additionally, the potential for AIS to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state

MANAGEMENT STRATEGIES

1. Cooperate with the BRA to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about AIS, and provide them with posters, literature, etc… so that they can in turn educate their customers.
3. Educate the public about AIS through the use of media and the internet.
4. Make a speaking point about AIS when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

Objective-Based Sampling Plan and Schedule (2022–2026)

Important sport and forage fishes: Abundant and/or important sport fishes in Granbury Reservoir include Largemouth Bass, catfishes, White Crappie, White Bass and Striped Bass. Important forage species include Gizzard Shad, Threadfin Shad, Bluegill and Longear Sunfish.

Fishes with low-density populations: Flathead Catfish and Black Crappie occur in low abundance in Granbury Reservoir and are generally caught incidentally to targeted species. We will continue collecting and reporting data for these species and upgrade their status if appropriate.

Survey objectives, fisheries metrics, and sampling objectives

Fall Electrofishing: This survey will be used to evaluate Largemouth Bass and primary forage species (Gizzard Shad, Bluegill Sunfish and Longear Sunfish). Largemouth Bass are one of the predominant sport fish in the reservoir, and their popularity justifies sampling time and effort. The most recent catch rate of Largemouth Bass was 31.2 fish/h, and the previous two surveys produced similar catch rates with good precision estimates. Therefore, a minimum of 15, random five-minute daytime electrofishing stations will be sampled in fall 2025. The goals of the Largemouth Bass survey will be general monitoring (using CPUE, size structure and relative weight as metrics) to characterize the Largemouth Bass population and make comparisons with historical and future, daytime electrofishing data. Catch per unit effort target precision will be an RSE < 25. Target sample size will be an N ≥ 50 stock-size fish to determine population size structure, allowing us to calculate proportional size distribution with 80% confidence. Mean relative weight will be determined by measuring and weighing at least 5 fish per represented inch group ≥ stock-length. If sampling objectives aren't achieved with the initial 15 stations and if catch rates indicate collecting our size structure target is reasonable, sampling will continue at random stations until that target is reached.

The goals of the forage species surveys will be general monitoring (using CPUE and size structure as metrics) to characterize Gizzard Shad, Bluegill Sunfish and Longear Sunfish populations and make comparisons with historical and future data. Since trend data show large variations in catch of forage species, no catch per unit effort target precision, target sample sizes or relative weights will be assigned. Index of Vulnerability (IOV) will be calculated for Gizzard Shad to assess the relative proportion of individuals in the population suitable as prey for sport fish.

Spring Trap Netting: This survey will be used to evaluate White Crappie. White Crappie were last sampled with winter trap netting in 2017 (2.9 fish/nn), spring trap netting in 2018 (5.5 fish/nn), and spring gill netting in 2018 (2.3 fish/nn) to determine gear and season differences in catch rates and to determine which gear/season combination produces the best sampling results for the species. Fall trap nets appeared to reflect the young-of-year class strength of White Crappie since length classes from 2 to 6-inches were well represented in that sample. Spring gill nets showed the highest percentage of legal-length fish, but no recent recruitment. Spring trap nets collected more individuals than the other two surveys combined, showed a high percentage of legal-length fish, and evidence of recent recruitment. Based on the population structures presented by these surveys, spring trap nets seem to show the most promise for future sampling of White Crappie on Granbury Reservoir. Therefore, a minimum of 15 random trap netting stations will be sampled in spring 2026. The goal of the White Crappie survey will be general monitoring (using CPUE, size structure and relative weight as metrics) to characterize the White Crappie population and make comparisons with historical and future data. Catch per unit effort target precision will be an RSE ≤ 25. Target sample size will be an N ≥ 50 stock-size fish to determine population size structure, allowing us to calculate proportional size distributions with 80% confidence. Mean relative weight will be determined by measuring and weighing at least 5 fish per represented inch group ≥ stock-length. If sampling objectives aren't met and if catch rates from the first fifteen nets indicate collecting our size structure target is reasonable, sampling will continue at random stations until that target is reached.

Spring Gill Netting: The gill net survey will be used to evaluate catfishes, White Bass and Striped Bass. The Category 3 age and growth sample to evaluate fry recruitment from the 2018 stocking was not

completed. Therefore, this sample will be completed in spring 2024 using as much effort as needed to document recruitment (or not) of that year class. A minimum of 10 random gill netting stations will be sampled in spring 2026. The goal of the 2026 gill netting survey will be general monitoring (using CPUE, size structure and relative weight as metrics) to characterize Channel Catfish and Striped Bass populations and make comparisons with historical and future data. Catch per unit effort target precision will be an RSE < 25. Target sample size will be an N ≥ 50 stock-size fish to determine population size structure, allowing us to calculate proportional size distributions with 80% confidence. Mean relative weight will be determined by measuring and weighing at least 5 fish per represented inch group ≥ stock-length. White Bass and Blue Catfish catch rates have historically been too low to expect to collect data with sufficient precision with this level of effort so no catch per unit effort target precision, target sample sizes or relative weights will be assigned for these species unless sufficient precision is achieved. Additionally, all gill netting will take place in late winter, which has been shown to increase catch rates of Morone species.

Angler Creel: This survey will be used to evaluate angler effort, success, preferences, and economic impact in spring and fall, 2024. The purpose would be to document angler response to the improved Striped Bass fishery as well as other popular fisheries such as Largemouth Bass. This will help determine the direction of future efforts including possible regulation changes.

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Tables and Figures

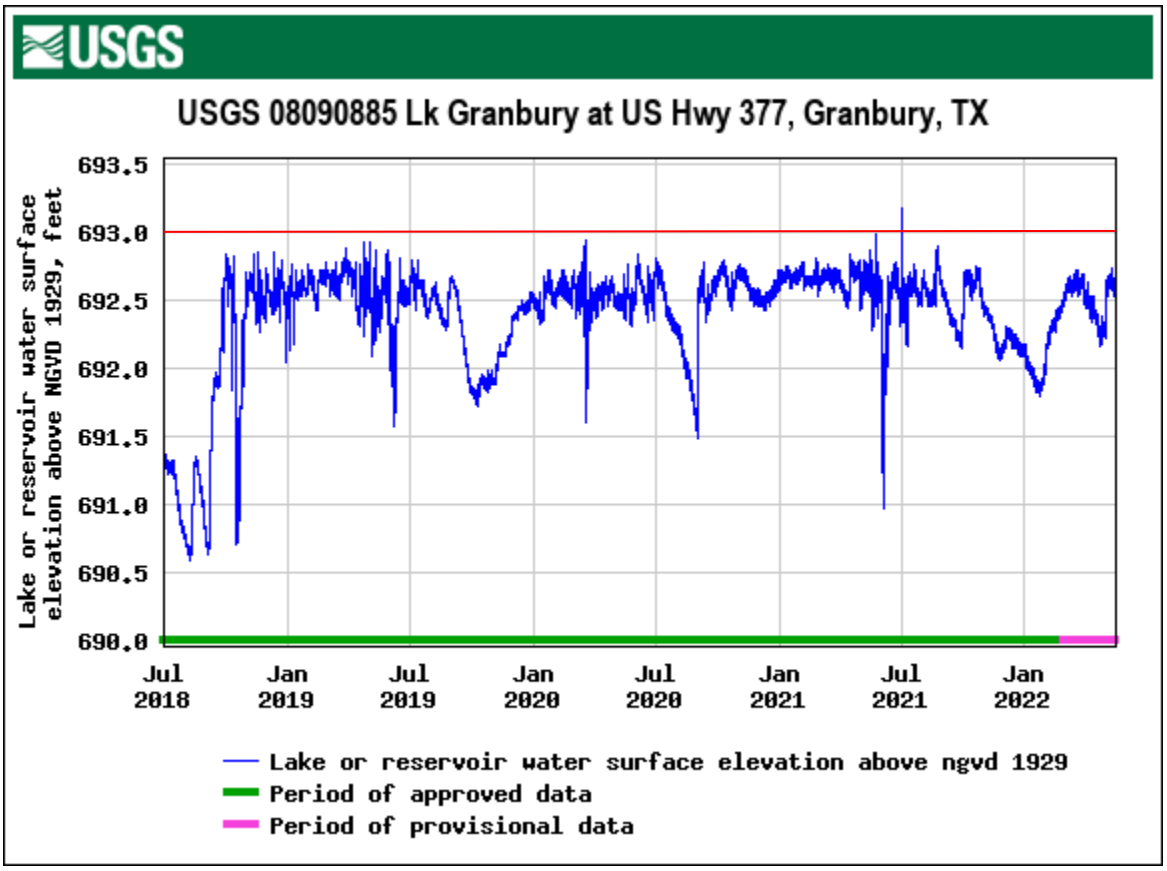


Figure 1. Daily mean water levels for Granbury Reservoir from July 2018 through April 2022. The red line indicates Conservation pool (693 feet msl). Figure from the USGS website (accessed May 2022).

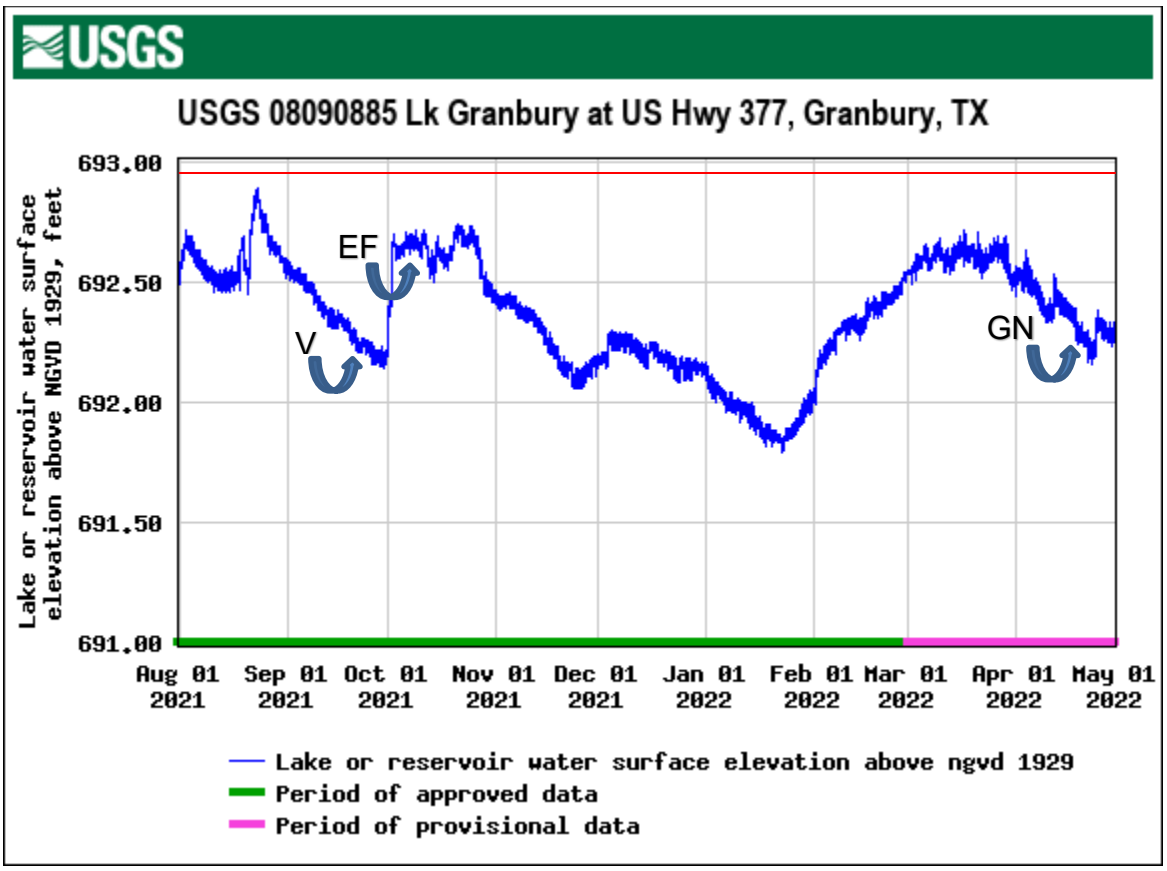


Figure 2. Daily mean water levels for Granbury Reservoir from August 2021 through April 2022. The red line indicates Conservation pool (693 feet msl). Vegetation, electrofishing and gill net surveys are indicated by V, EF and GN. Figure from the USGS website (accessed May 2022).

Table 1. Characteristics of Granbury Reservoir, Texas.

Characteristic	Description
Year constructed	1969
Controlling authority	Brazos River Authority
County	Hood
Reservoir type	Mainstem
Shoreline Development Index	8.4
Conductivity	2,400 µS/cm

Table 2. Boat ramp characteristics for Granbury Reservoir, Texas. Water level was about one foot below conservation pool (i.e., 692' above mean sea level) during the 2021 access survey. Latitude and longitude are in decimal degrees.

Boat ramp	Latitude; Longitude	Public?	Parking capacity	Condition
Thorp Spring	32.4734/-97.8148	Y	24	1 lane; good
Hunter Park	32.4778/-97.7954	Y	18	1 lane; good
City Park	32.4439/-97.7710	Y	44	3 lanes; good
Rough Creek	32.4181/-97.7863	Y	27	4 lanes; good
DeCordova Bend	32.3773/-97.6916	Y	24	3 lanes; good

Table 3. Harvest regulations for Granbury Reservoir, Texas.

Species	Bag Limit	Length limit (inches)
Catfish: Channels and Blues	25[B]	No Limit
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Striped	5	18-inch minimum
Bass: Largemouth and Smallmouth	5[A]	14-inch minimum
Bass, Spotted	5[A]	No minimum
Crappie: White and Black	25 (any combination)	10-inch minimum

[A] Daily bag limit for Largemouth Bass, Spotted Bass and Smallmouth Bass = 5 fish in any combination.

[B] Daily bag for Channels and Blues = 25 in any combination; only 10 can be 20 inches or greater.

Table 4. Stocking history for Granbury Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Blue Catfish	1991	86,343	FGL	2.5
	Total	86,343		
Channel Catfish	1969	374,675	AFGL	7.9
	1993	300	AFGL	4.9
	Total	374,975		
Florida Largemouth Bass	1986	8,178	FRY	0.9
	1989	212,290	FGL	1.3
	1989	212,234	FRY	0.9
	1994	435,331	FGL	1.1
	1995	435,924	FGL	1.4
	2003	425,723	FGL	1.3
	2004	214,164	FGL	1.6
	2008	208,273	FGL	1.5
	2017	176,283	FGL	1.5
	2018	168,336	FGL	1.8
	Total	2,496,736		
Largemouth Bass	1969	126,640	UNK	0.0
	1970	1,700,000	FRY	0.7
	1972	30,160	UNK	0.0
	1993	200	AFGL	4.9
	Total	1,857,000		
Striped Bass	1972	27,250	FGL	1.7
	1973	172,970	FGL	1.7
	1974	85,000	FGL	1.7
	1975	39,998	UNK	0.0
	1976	86,154	UNK	0.0
	1979	85,791	UNK	0.0
	1981	100,502	UNK	0.0
	1983	176,332	UNK	0.0
	1989	87,000	FGL	1.5
	1990	93,315	FGL	1.5
	1994	143,656	FGL	1.2
	1995	43,807	FGL	1.3
	1997	87,068	FGL	1.3
	1998	88,206	FGL	1.3
	1999	88,121	FGL	1.4

Table 4. Stocking history for Granbury Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Striped Bass	2000	44,000	FGL	1.4
	2001	2,100,000	FRY	0.8
	2002	174,657	FGL	1.6
	2003	85,444	FGL	1.5
	2004	43,271	FGL	1.5
	2005	125,155	FGL	1.7
	2006	127,280	FGL	1.6
	2007	125,278	FGL	1.4
	2008	126,079	FGL	1.8
	2009	44,864	FGL	1.8
	2010	46,165	FGL	1.9
	2010	415,763	FRY	0.2
	2013	66,462	FGL	2.1
	2013	400,000	FRY	0.2
	2014	38,186	FGL	1.5
	2015	27,829	FGL	1.9
	2015	375,740	FRY	0.2
	2017	88,896	FGL	2.0
	2018	629,419	FRY	0.2
	2020	501,119	FRY	0.2
	2021	2,033	AFGL	6.3
	2021	91,403	FGL	1.6
	2021	259,432	FRY	0.2
	2022	127,743	FGL	
	Total	7,471,388		

Table 5. Objective-based sampling plan components for Granbury Reservoir, Texas 2021–2022. Trap netting was not conducted for White Crappie, and the category 3 age and growth sample was not conducted for Striped Bass.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	W_r	10 fish/inch group (max)
Bluegill [a]	Abundance	CPUE–Total	None
	Size structure	PSD, length frequency	None
Longear Sunfish [a]	Abundance	CPUE–Total	None
	Size structure	PSD, length frequency	None
Gizzard Shad [a]	Abundance	CPUE–Total	None
	Size structure	PSD, length frequency	None
	Prey availability	IOV	N ≥ 50
Trap netting			
White Crappie	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Condition	W_r	10 fish/inch group (max)
Gill netting			
White Bass	Abundance	CPUE–Total	None
	Size structure	PSD, length frequency	None
	Condition	W_r	None
Striped Bass	Population dynamics	Age, growth, mortality	200 total fish sample
	Abundance	CPUE-Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Condition	W_r	10 fish/inch group (max)
Channel Catfish	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Condition	W_r	10 fish/inch group (max)
White Crappie	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Condition	W_r	10 fish/inch group (max)

[a] No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

Table 6. Survey of aquatic vegetation, Granbury Reservoir, Texas, 2017 and 2021. The data show percentages of randomly selected shoreline points where species occurred. Water level was near full pool during the surveys. There were 168 shoreline points in 2017 and 162 shoreline points in 2021.

Vegetation	2017	2021
Bulrush	1.2% (0.1 to 4.2)	
Cattail	9% (5.1 to 14.3)	13% (8.2 to 19.1)
American water-willow	6% (2.9 to 10.7)	6.8% (3.4 to 11.8)
Giant reed	12% (7.4 to 17.8)	11% (6.7 to 17.0)
Lotus		0.6% (0.0 to 3.4)

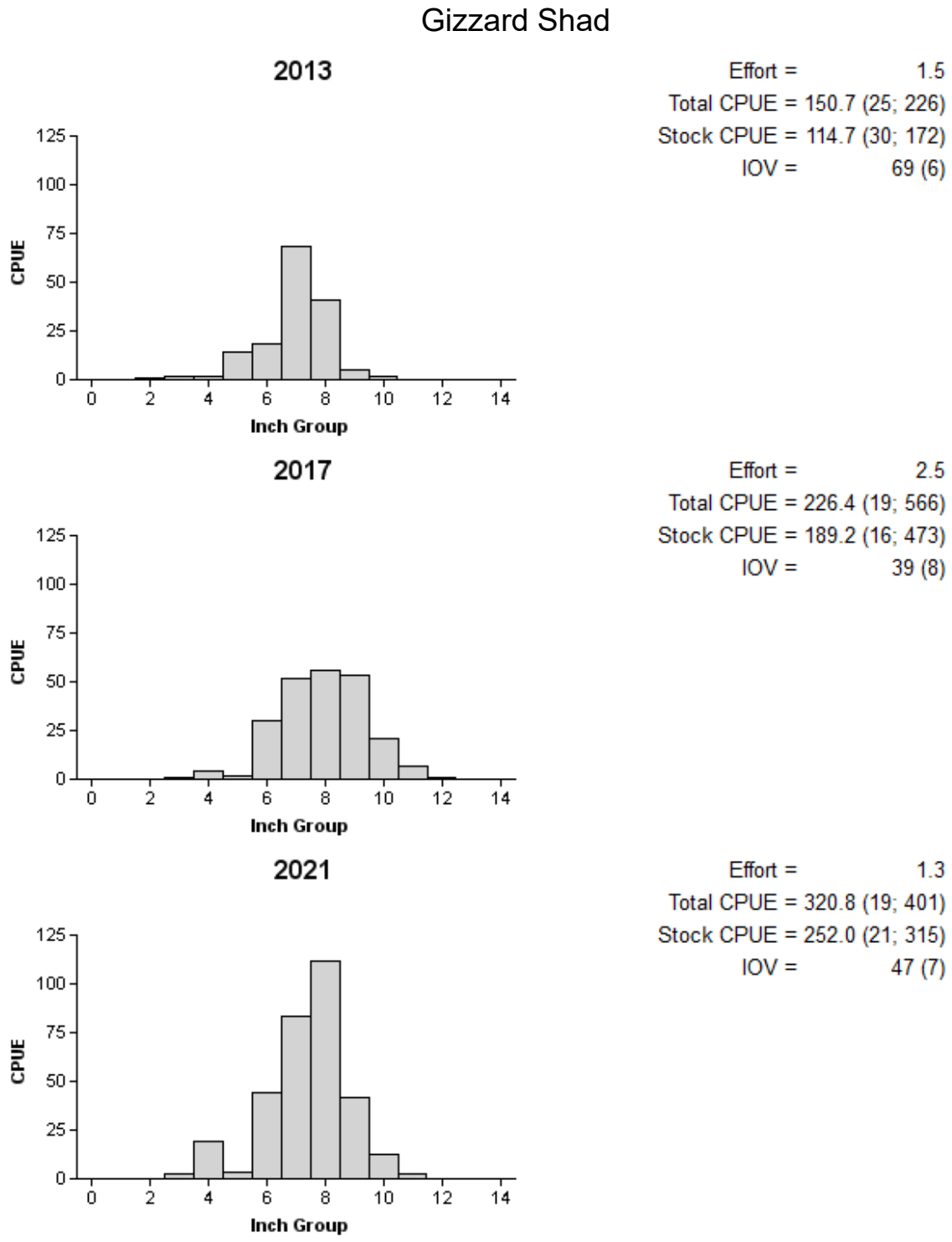


Figure 3. Number of Gizzard Shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for IOV in parentheses) for fall electrofishing surveys, Granbury Reservoir, Texas, 2013 (nighttime), 2017 (daytime), and 2021 (daytime).

Bluegill

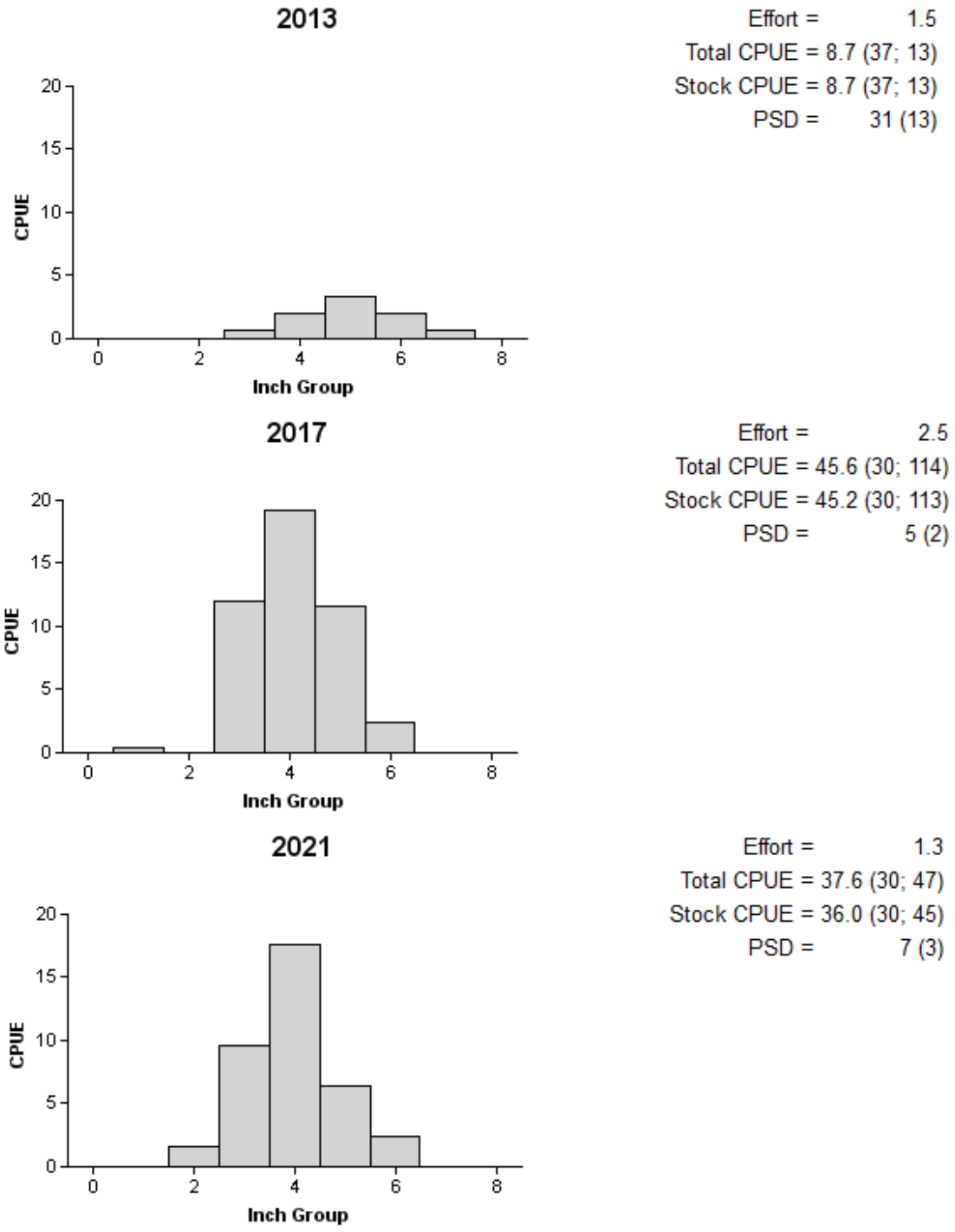


Figure 4. Number of Bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure in parentheses) for fall electrofishing surveys, Granbury Reservoir, Texas, 2013 (nighttime), 2017 (daytime), and 2021 (daytime).

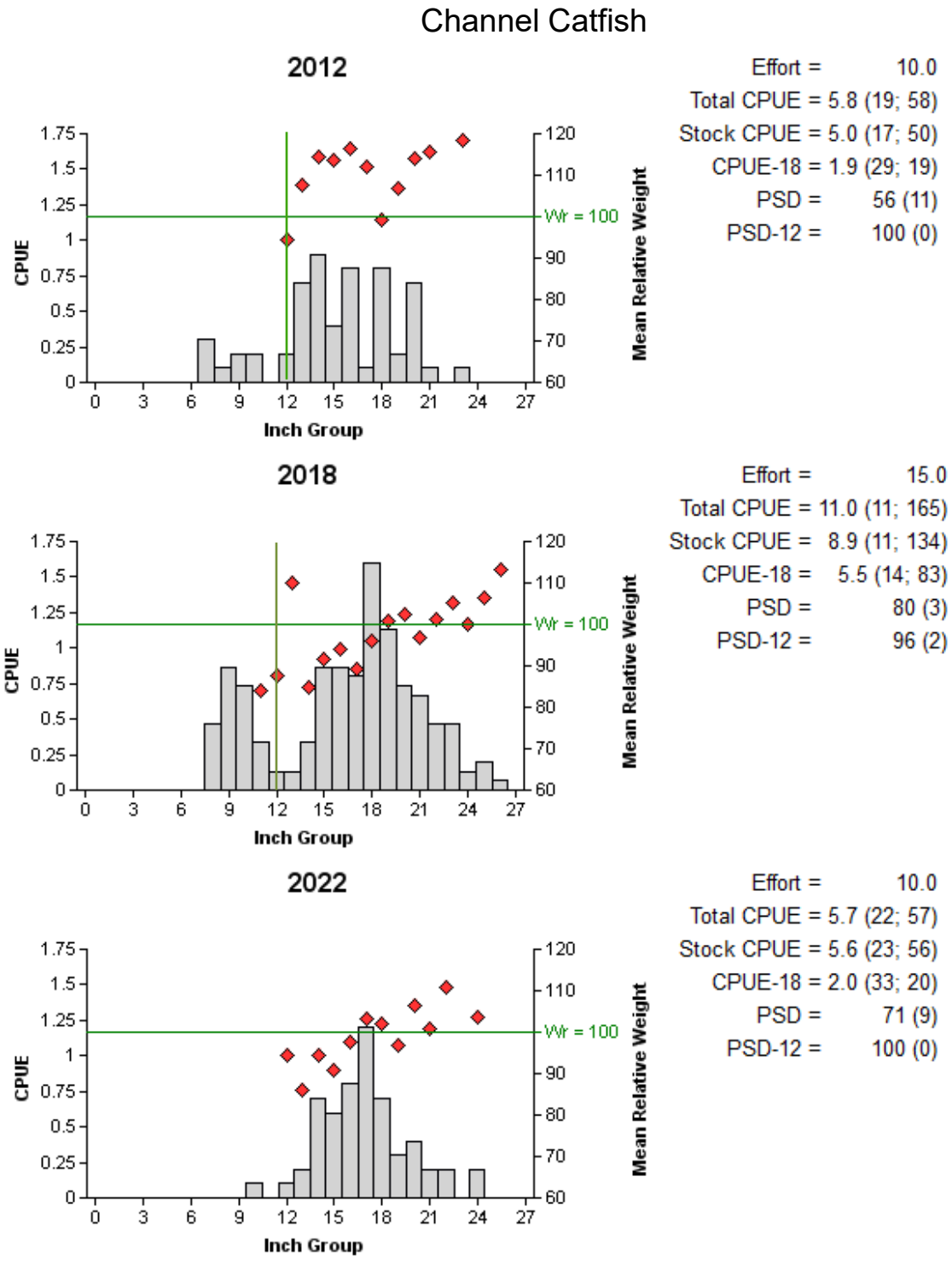


Figure 5. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Granbury Reservoir, Texas, 2012, 2018, and 2022. Vertical line indicates the minimum length limit prior to 2021, while the horizontal line represents optimal condition.

White Bass

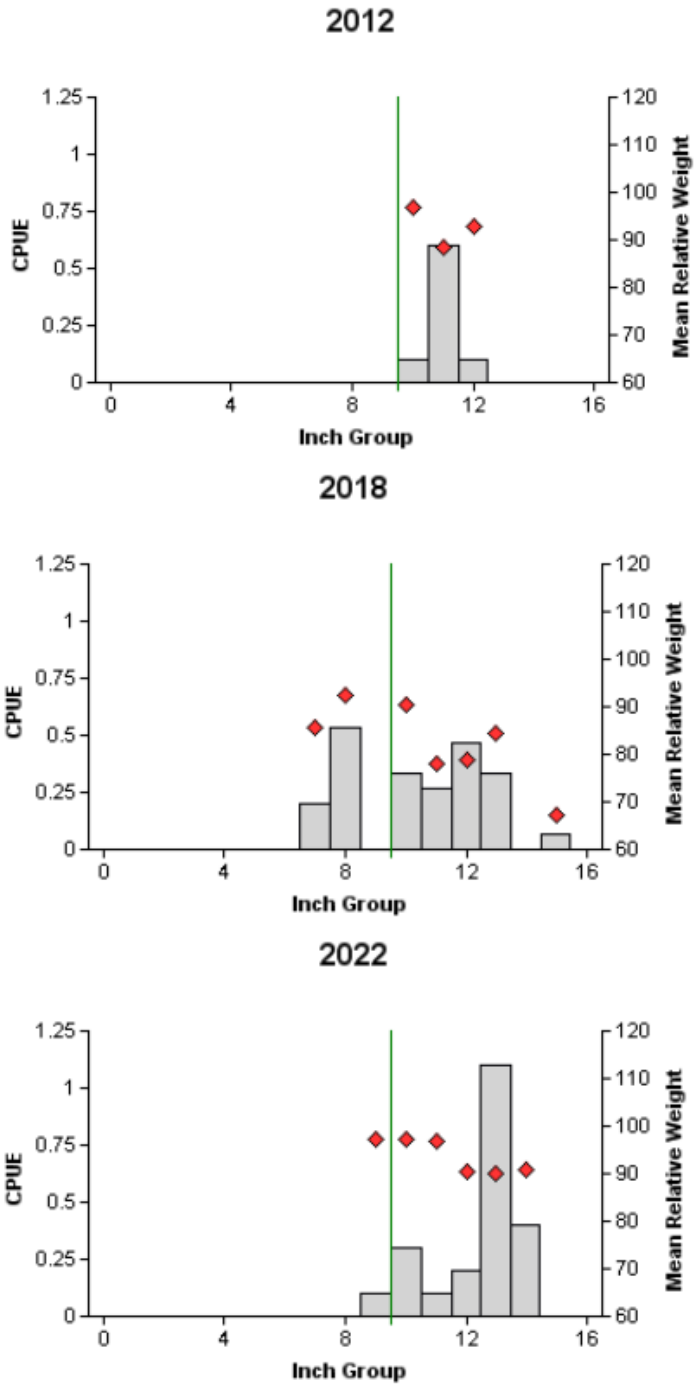


Figure 2. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Granbury Reservoir, Texas, 2012 2018, and 2022. Vertical line indicates the minimum length limit while the horizontal line represents optimal condition.

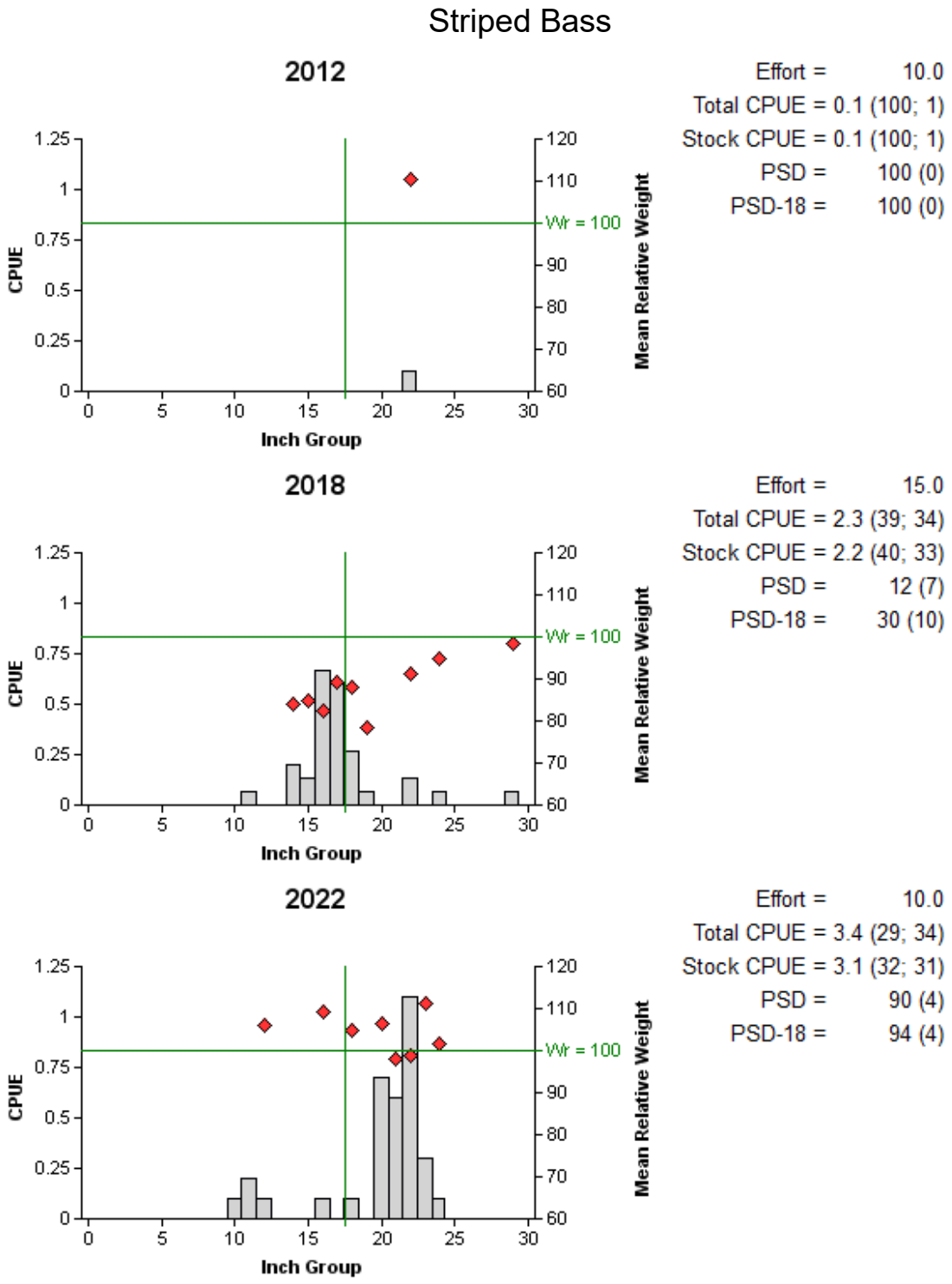


Figure 7. Number of Striped Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Granbury Reservoir, Texas, 2012, 2018, and 2022. Vertical line indicates the minimum length limit while the horizontal line represents optimal condition.

Largemouth Bass

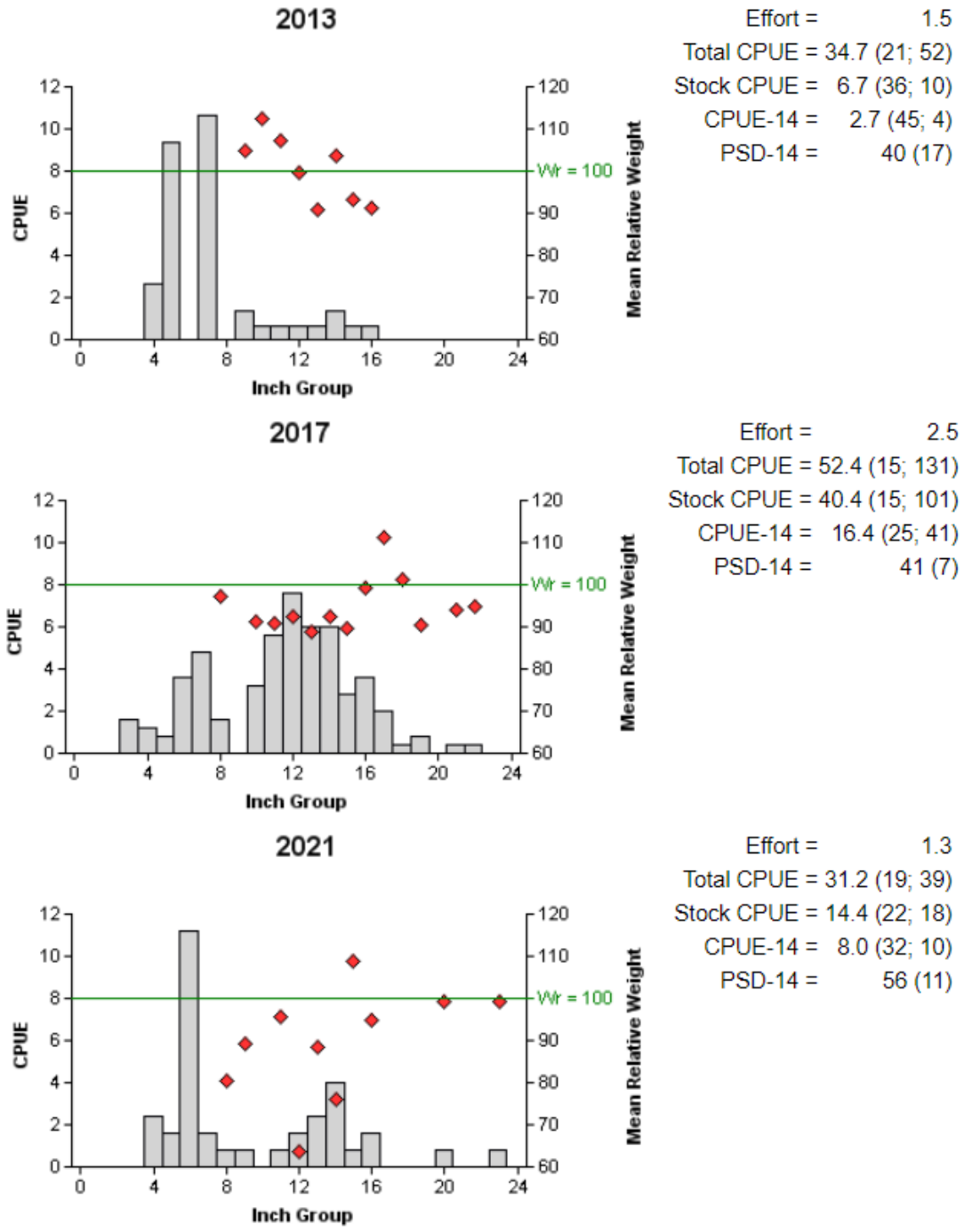


Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for fall electrofishing surveys, Granbury Reservoir, Texas, 2013 (nighttime), 2017 (daytime), and 2021 (daytime). The minimum length limit in 2013 and 2017 was 16 inches, whereas it was 14 inches in 2021. The horizontal line represents optimal condition.

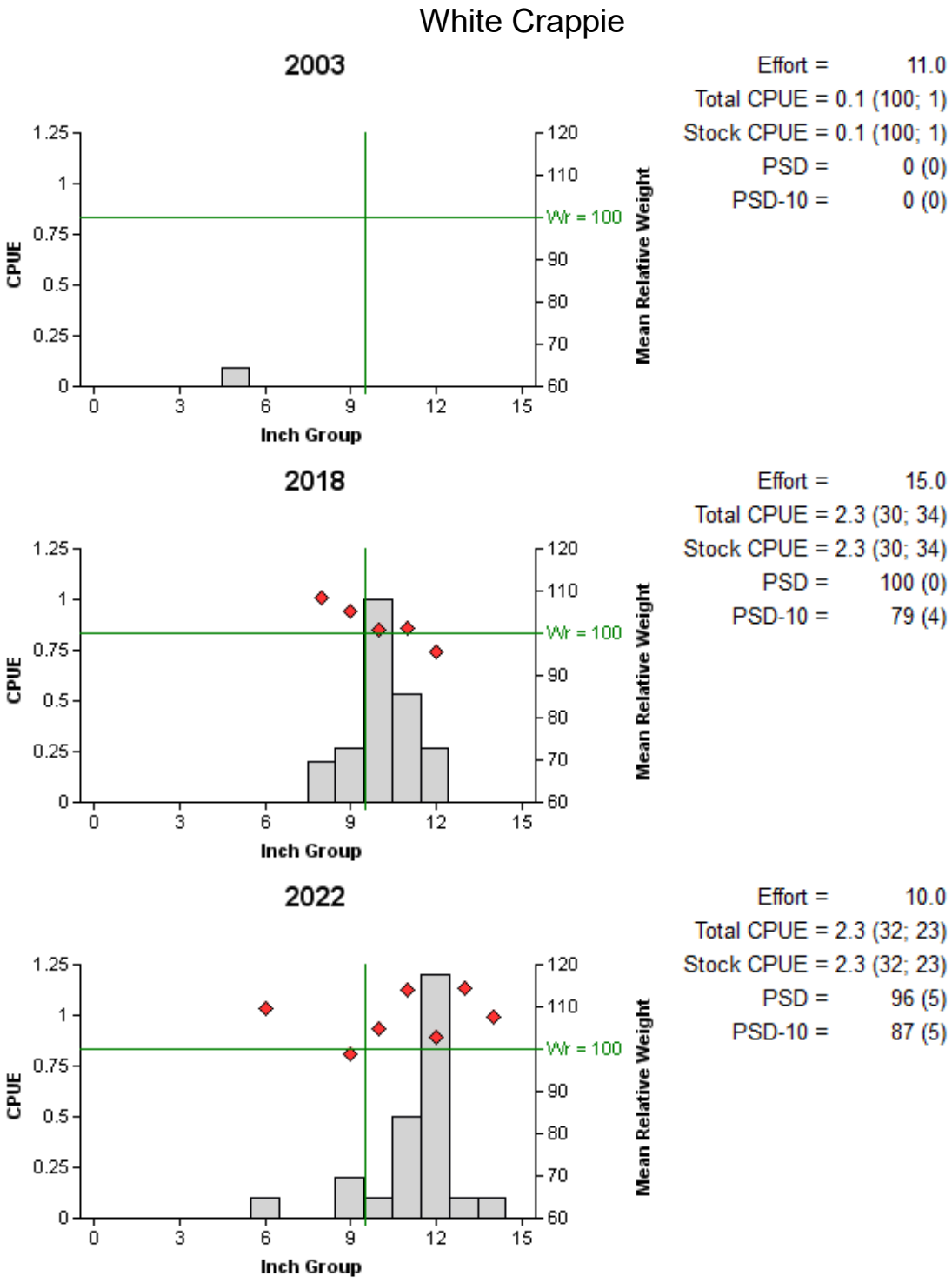


Figure 9. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Granbury, Texas, 2003, 2018 and 2022; crappies weren't counted in 2012. Vertical line indicates the minimum length limit while the horizontal line represents optimal condition.

Proposed Sampling Schedule

Table 6. Proposed sampling schedule for Granbury Reservoir, Texas. Survey period is June through May. Gill netting and trap netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall.

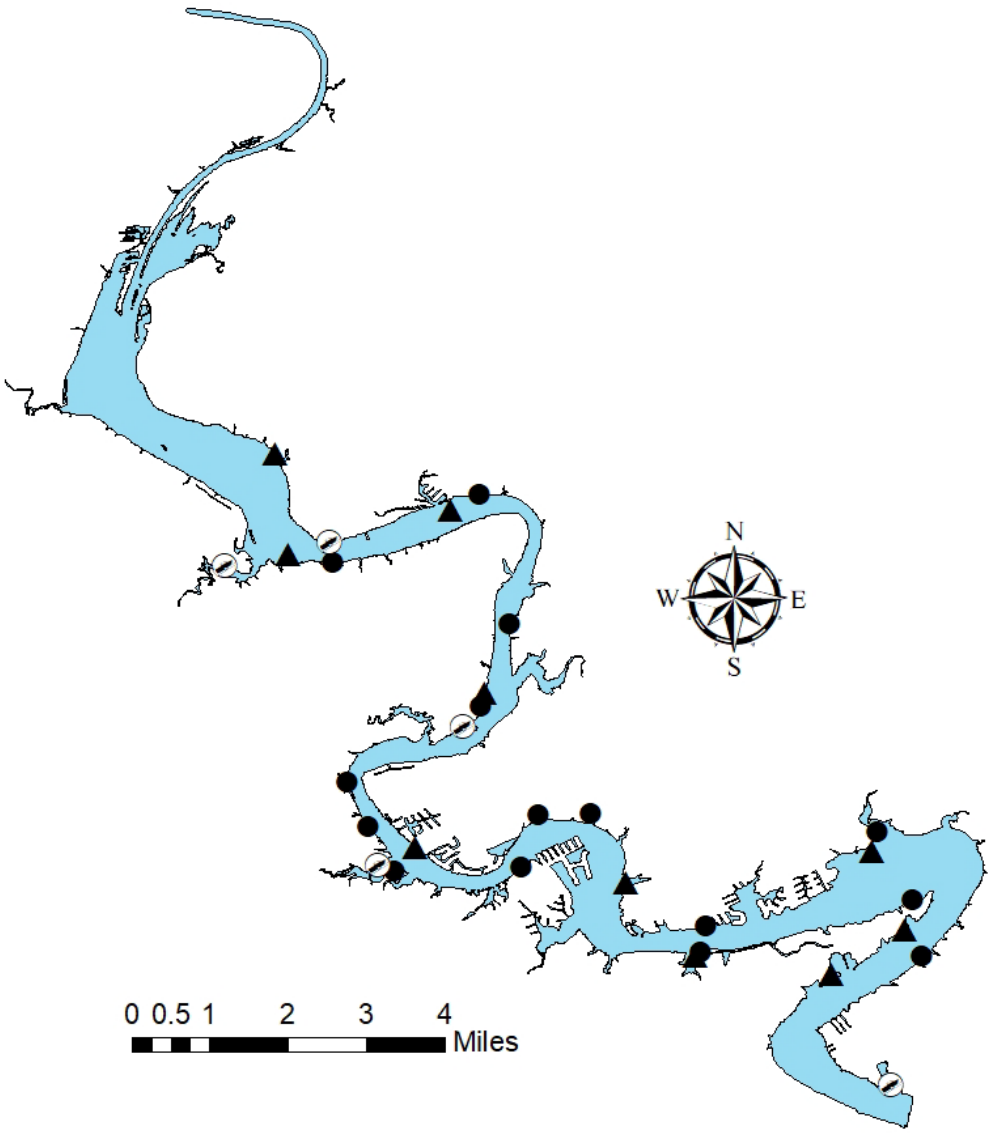
	Survey year			
	2022-2023	2023-2024	2024-2025	2025-2026
Angler Access				X
Vegetation				X
Creel survey		X	X	
Electrofishing – Fall				X
Trap netting				X
Gill netting			X	X
Report				X

APPENDIX A – Catch rates for all species from all gear types

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from electrofishing and gill netting surveys on Granbury Reservoir, Texas, 2021-2022. Sampling effort was 1.25 hours for electrofishing (15, 5-minute stations) and 10 net nights for gill netting.

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			401	320.8 (19)
Threadfin Shad			213	170.4 (42)
Blue Catfish	21	2.1 (38)		
Channel Catfish	57	5.7 (22)		
Flathead Catfish	4	0.4 (67)		
White Bass	22	2.2 (32)		
Striped Bass	34	3.4 (29)		
Green Sunfish			3	2.4 (53)
Bluegill			47	37.6 (30)
Longear Sunfish			22	17.6 (27)
Redear Sunfish			3	2.4 (53)
Largemouth Bass			39	31.2 (19)
White Crappie	23	2.3 (32)		

APPENDIX B – Map of sampling locations



Location of sampling sites, Granbury Reservoir, Texas, 2021-2022. Electrofishing and gill netting stations are indicated by circles and triangles, respectively. Boat ramps are indicated by a small boat in a circle. Water level was within one foot of conservation pool at time of sampling.

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ATTACHMENT T-3
Treatment Chemicals
Wolf Hollow-I Generating Station
TPDES Permit No. WQ0004288000

Product ID		Usage	Components Listed in SDS	Frequency	Estimated Concentration in Outfall Discharge		Aquatic Toxicity Data in SDS	Persistence / Bioaccumulative Data in SDS
3D TRASAR 3DT487	Nalco	Cooling water treatment	Phosphoric acid [7664-38-2]				Yes	Yes
Aqua Ammonia	Skyhawk	Amine for HRSG treatment	Ammonia [7664-41-7]	Continuous	5 ppm as product, ~1 ppm as ammonia		Yes	No
BT-4000	Nalco	HRSG/Aux Boiler internal treatment	Sodium hydroxide [1310-73-2]	Based on pH control, typically continuous	< 1ppm		Yes	Yes
CAT-FLOC 8108 PLUS	Nalco	Clarifier coagulant	No hazardous substances listed	Continuous	5-10 ppm as product depending on incoming lake turbidity		Yes	Yes
Citric acid		Ultrafiltration system membrane cleaner	Citric acid [77-92-9]	Once a month	10 ppm		Yes	Yes
PermaClean PC-77	Nalco		No hazardous substances listed	Once a month for 45 minutes	100 ppm as product		Yes	Yes
PermaClean PC-98	Nalco	Reverse osmosis cleaner	Tetrasodium EDTA [64-02-8]	Once a month for 45 minutes	10 ppm as product		Yes	Yes
Sodium bisulfite	Skyhawk	Outfall dechlorination	Sodium bisulfite [7631-90-5]	Continuous	2-3 ppm, depending on chlorine in effluent		Yes	No
Sodium hydroxide	Skyhawk	Reverse osmosis pretreatment, clarifier effluent treatment	Sodium hydroxide [1310-73-2]	Continuous	10-20 ppm based on incoming CO2 levels		No	No
Sodium hypochlorite	Skyhawk	Cooling tower biocide	Sodium hypochlorite [7681-52-9]	As needed	0.05-0.1 ppm free chlorine residual, depending on organic loading in lake water		Yes	No
			Sodium hydroxide [1310-73-2]					
Sulfuric acid	Skyhawk	pH control	Sulfuric acid [7664-93-9]	Continuous	70 ppm, depending on incoming alkalinity in lake water		Yes	Yes

* Concentrations are estimated and do not account for chemical breakdown or consumption in the process that may further reduce the product concentration.

4/6/25

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SAFETY DATA SHEET

3D TRASAR™ 3DT487

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	3D TRASAR™ 3DT487
Other means of identification	:	Not applicable.
Recommended use	:	COOLING WATER TREATMENT
Restrictions on use	:	Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company	:	Nalco Company 1601 W. Diehl Road Naperville, Illinois 60563-1198 USA TEL: (630) 305-1000
Emergency telephone number	:	(800) 424-9300 (24 Hours) CHEMTREC
Issuing date	:	05/31/2022

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Corrosive to metals : Category 1

GHS Label element

Hazard pictograms :

Signal Word : Warning

Hazard Statements : May be corrosive to metals.

Precautionary Statements : **Prevention:**
Keep only in original container.
Response:
Absorb spillage to prevent material damage.
Storage:
Store in corrosive resistant container with a resistant inner liner.

Other hazards : Do not mix with bleach or other chlorinated products – will cause chlorine gas.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Concentration: (%)
Phosphoric Acid	7664-38-2	5 - 10

Section: 4. FIRST AID MEASURES

In case of eye contact	:	Rinse with plenty of water. Get medical attention if symptoms occur.
In case of skin contact	:	Wash off with soap and plenty of water. Get medical attention if symptoms occur.
If swallowed	:	Rinse mouth. Get medical attention if symptoms occur.
If inhaled	:	Get medical attention if symptoms occur.
Protection of first-aiders	:	In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
Notes to physician	:	Treat symptomatically.
Most important symptoms and effects, both acute and delayed	:	See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	None known.
Specific hazards during firefighting	:	Not flammable or combustible.
Hazardous combustion products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus
Special protective equipment for firefighters	:	Use personal protective equipment.
Specific extinguishing methods	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Do not allow contact with soil, surface or ground water.
Methods and materials for containment and cleaning up	:	Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling	:	Wash hands thoroughly after handling. Use only with adequate ventilation. Do not mix with bleach or other chlorinated products – will cause chlorine gas.
Conditions for safe storage	:	Keep away from strong bases. Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.
Suitable material	:	The following compatibility data is suggested based on similar product data and/or industry experience: CPVC (rigid), EPDM, HDPE (high density polyethylene), Kalrez, LLDPE, Neoprene, Nitrile, Nylon 11, Plexiglass, Polypropylene, Polyvinylidene difluoride, PTFE, PVC, UHMWPE, Viton (R), Welded Stainless Steel 316
Unsuitable material	:	The following compatibility data is suggested based on similar product data and/or industry experience: Brass, Epoxy phenolic resin, Mild steel, Phenolic, Stainless Steel 304, Stainless Steel 316L

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Phosphoric Acid	7664-38-2	TWA	1 mg/m3	ACGIH
		STEL	3 mg/m3	ACGIH
		TWA	1 mg/m3	NIOSH REL
		ST	3 mg/m3	NIOSH REL
		TWA	1 mg/m3	OSHA Z-1

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Eye protection	:	Safety glasses
Hand protection	:	Wear protective gloves. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin protection	:	Wear suitable protective clothing.
Respiratory protection	:	No personal respiratory protective equipment normally required.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling.

The Personal Protective Equipment (PPE) recommendations provided above have been made in good faith based on typical expected conditions of use. PPE selection should always be completed in conjunction with a proper risk assessment and in accordance with a PPE management program.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	yellow
Odour	:	None
Flash point	:	Not flammable
pH	:	1.3 - 2.0
Odour Threshold	:	no data available
Melting point/freezing point	:	Melting point/freezing point: -7.4 °C
Initial boiling point and boiling range	:	97.8 °C
Evaporation rate	:	no data available
Flammability (solid, gas)	:	Not applicable.
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Relative density	:	1.223, (15.6 °C), 1.2050 - 1.2350, (25 °C),
Density	:	no data available
Water solubility	:	Complete
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	16.5 mPa.s (23 °C)
Viscosity, kinematic	:	no data available
Molecular weight	:	no data available
VOC	:	no data available

Section: 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Do not mix with bleach or other chlorinated products – will cause chlorine gas.
Conditions to avoid	:	None known.

Incompatible materials	:	Strong bases
Hazardous decomposition products	:	In case of fire, hazardous decomposition products may be produced such as: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	:	Health injuries are not known or expected under normal use.
Skin	:	Health injuries are not known or expected under normal use.
Ingestion	:	Health injuries are not known or expected under normal use.
Inhalation	:	Health injuries are not known or expected under normal use.
Chronic Exposure	:	Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact	:	No symptoms known or expected.
Skin contact	:	No symptoms known or expected.
Ingestion	:	No symptoms known or expected.
Inhalation	:	No symptoms known or expected.

Toxicity

Product

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg
Acute inhalation toxicity	:	Acute toxicity estimate: 10.39 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	no data available
Skin corrosion/irritation	:	no data available
Serious eye damage/eye irritation	:	no data available
Respiratory or skin sensitization	:	no data available
Carcinogenicity	:	no data available
Reproductive effects	:	no data available

Germ cell mutagenicity	:	no data available
Teratogenicity	:	no data available
STOT - single exposure	:	no data available
STOT - repeated exposure	:	no data available
Aspiration toxicity	:	no data available

Components

Acute dermal toxicity	:	Phosphoric Acid LD50 rabbit: > 2,000 mg/kg

Section: 12. ECOLOGICAL INFORMATION

Toxicity

Environmental Effects	:	This product has no known ecotoxicological effects.

Product

Toxicity to fish	:	LC50 Fathead Minnow: 7,175 mg/l Exposure time: 96 hrs Test substance: Product NOEC Fathead Minnow: 3,600 mg/l Exposure time: 96 hrs Test substance: Product LC50 Rainbow Trout: > 10,000 mg/l Exposure time: 96 hrs Test substance: Product NOEC Rainbow Trout: 6,000 mg/l Exposure time: 96 hrs Test substance: Product
Toxicity to daphnia and other aquatic invertebrates	:	EC50 Ceriodaphnia dubia: 1,103 mg/l Exposure time: 48 hrs Test substance: Product LC50 Ceriodaphnia dubia: 1,350 mg/l Exposure time: 48 hrs Test substance: Product NOEC Ceriodaphnia dubia: 313 mg/l Exposure time: 48 hrs Test substance: Product Test Type: Immobilization NOEC Ceriodaphnia dubia: 625 mg/l Exposure time: 48 hrs Test substance: Product
Toxicity to daphnia and other aquatic invertebrates	:	EC25 / IC25: 376 mg/l Exposure time: 7 d

(Chronic toxicity)

Species: Ceriodaphnia dubia
Test substance: Product
Test Type: Reproduction

NOEC: 94 mg/l
Exposure time: 7 d
Species: Ceriodaphnia dubia
Test substance: Product
Test Type: Reproduction

LOEC: 188 mg/l
Exposure time: 7 d
Species: Ceriodaphnia dubia
Test substance: Product
Test Type: Reproduction

Components

Toxicity to algae : Phosphoric Acid
EC50 Desmodesmus subspicatus (green algae): > 100 mg/l
Exposure time: 72 h

Persistence and degradability

Total Organic Carbon (TOC) : 120,000 mg/l

Chemical Oxygen Demand (COD): 300,000 mg/l

Biochemical Oxygen Demand (BOD):

Incubation Period	Value	Test Descriptor
5 d	400 mg/l	

Mobility

no data available

Bioaccumulative potential

no data available

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

Disposal methods : Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of contents/container in accordance with local regulations Dispose of wastes in an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name	:	PHOSPHORIC ACID SOLUTION
Technical name(s)	:	
UN/ID No.	:	UN 1805
Transport hazard class(es)	:	8
Packing group	:	III
Reportable Quantity (per package)	:	54,007 lbs
RQ Component	:	Phosphoric Acid

Air transport (IATA)

Proper shipping name	:	PHOSPHORIC ACID SOLUTION
Technical name(s)	:	
UN/ID No.	:	UN 1805
Transport hazard class(es)	:	8
Packing group	:	III
Reportable Quantity (per package)	:	54,007 lbs
RQ Component	:	Phosphoric Acid

Sea transport (IMDG/IMO)

Proper shipping name	:	PHOSPHORIC ACID SOLUTION
Technical name(s)	:	
UN/ID No.	:	UN 1805
Transport hazard class(es)	:	8
Packing group	:	III

Section: 15. REGULATORY INFORMATION

TSCA list : No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Phosphoric Acid	7664-38-2	5000	54007

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Corrosive to metals

SARA 302 : This material does not contain any components with a section 302 EHS TPQ.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

Canadian Domestic Substances List (DSL)
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

United States TSCA Inventory
On or in compliance with the active portion of the TSCA inventory

Korea. Korean Existing Chemicals Inventory (KECI)
All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Japan. ENCS - Existing and New Chemical Substances Inventory
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

Australia. Australian Industrial Chemicals Introduction Scheme (AICIS)
On the inventory, or in compliance with the inventory.

Philippines Inventory of Chemicals and Chemical Substances (PICCS)
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

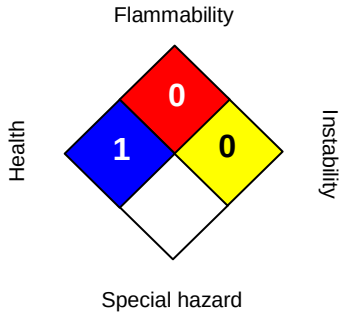
China Inventory of Existing Chemical Substances
On the inventory, or in compliance with the inventory.

Taiwan Chemical Substance Inventory
not determined

Section: 16. OTHER INFORMATION

3D TRASAR™ 3DT487

NFPA:



HMIS III:

HEALTH	1
FLAMMABILITY	0
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date	:	05/31/2022
Version Number	:	1.11
Prepared By	:	Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
For additional copies of an SDS visit www.nalco.com and request access.

SAFETY DATA SHEET Effective Date: April 30, 2015

I. Product and Company Information

Product Name(s):	Aqua Ammonia (15% - 30% as NH_3)	**Synonym:**	Ammonia Solution
Chemical Name:	Ammonium Hydroxide	**CAS Number:**	1336-21-6

Supplier's Name:
Skyhawk Chemicals, Inc.
701 N. Post Oak Rd., Ste. 540
Houston, TX 77024
Phone: 713-957-2200 / 800-535-2847 Fax: 713-957-0345
order@skyhawkchemicals.com

Emergency Contacts:
Afterhours (Skyhawk)1-800-535-2847
For Chemical Emergency, Spill or Accident
Call CHEMTREC at 1-800-424-9300
ACCOUNT # CCN721839

II. Hazard Identification

OSHA HCS / GHS Classification(s):	**Hazard Statement(s):**
Acute Toxicity, Oral (Category 4)	Harmful if swallowed.
Skin Corrosion (Category 1)	Causes severe skin burn.
Serious Eye Damage (Category 1)	Causes serious eye damage.
Specific Target Organ Toxicity (Respiratory - single exposure) - (Category 3)	May cause respiratory irritation.
Acute Aquatic Toxicity (Category 3)	Harmful to aquatic life.

Signal Word:	**Precautionary Statement(s):**	
Danger	**Prevention:**	Wash affected body parts thoroughly after handling.
		Do not eat, drink, or smoke when using this product.
		Wear eye and face protection.
		Wear protective gloves and clothing.
		Do not breathe mist, vapors, or spray.
		Avoid release to the environment.
	Response:	IF SWALLOWED: Rinse mouth. Do not induce vomiting. Immediately seek medical advice.
		IF ON SKIN: Take off immediately all contaminated clothing. Rinse skin with water.
		IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
		IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
		Collect spillage: See section VI - Accidential Release Measures.
		For specific treatment: See section IV - First Aid section.

III. Composition / Information on Ingredients

Chemical Name	**CAS Reg #'s**	**%**
Ammonia (NH_3)	7664-41-7	15 - 30.5
Water	7732-18-5	Balance

IV. First Aid Measures	
Eyes:	Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Remove any contact lenses. Seek medical attention, if you feel unwell.
Dermal / Skin:	Remove contaminated clothing and wash exposed area thoroughly with soap and water. Seek medical attention, if you feel unwell.
Inhalation:	Move to fresh air immediately. If breathing is difficult, give oxygen. Seek medical attention, if you feel unwell.
Ingestion:	If swallowed, DO NOT induce vomiting. Rinse mouth. Seek medical attention, if you feel unwell.

V. Fire Fighting Measures				
NFPA Hazard Rating:	Health (Blue)	Fire (Red)	Reactivity (Yellow)	Special Instructions (White)
	3	1	0	None
NFPA Hazard Classification: 0 = Least 1 = Slight 2 = Moderate 3 = High 4 = Extreme				
Extinguishing Media:	Use extinguishing media appropriate for surrounding fire (Not CO_2).			
Special Firefighting Procedure:	Wear full protective clothing and a self-contained breathing apparatus (SCBA) because toxic fumes are emitted. Stop flow if possible. Use water to keep fire-exposed containers cool and to protect persons shutting off flow of liquid. For a serious leak, use fire hose with a fog nozzle and plenty of water to absorb ammonia vapors.			
Unusual Fire and Explosive Hazards:	At elevated temperatures, aqua ammonia will emit ammonia gas and possibly small amounts of nitrogen oxides which have been classified as toxic. Presence of oil or other combustible materials increases the fire hazard of ammonia gas. Ammonia concentrations in the range of 16-25% by volume in air can be ignited or caused to explode if heated to the auto-ignition temperature.			

VI. Accidental Release Measures	
Precaution if Spilled or Released:	Steps should be taken to contain spilled liquids and prevent discharges to streams or sewer systems. Ventilate spill or leak area to disperse gas. Eliminate all sources of ignition. Stop flow if possible. If small spill, either allow it to vaporize or absorb the vapor in water. If large spill, spray the vapor cloud with water to reduce fire and fume hazard.
Neutralizing Chemicals:	Neutralization with acid not recommended. Flush area with water.

VII. Handling and Storage	
Handling:	Handle all chemicals with respect. Keep separated from incompatible substances. Handle only with equipment, materials, and supplies specified by their manufacturer as being compatible and appropriate for use with this product.
Storage:	Storage in specially designated areas outside or in detached structure is preferred. Store inside only in a cool, well-ventilated area free from combustibles and away from all sources of ignition. Protect containers from corrosion and mechanical damage. Containers should have safety relief valves. Separate from other chemicals, particularly oxidizing gases, organic materials, chlorine, bromine, iodine, mercury, and acids. Post readily visible warning signs in the storage area listing emergency measures. Water hoses should be readily available to knock down vapors from spill.

VIII. Exposure Control / Personal Protective Equipment

Component Workplace Control Parameters:

Components:	CAS-No.	Value	Parameters	Basis
Ammonia NH_3	7664-41-7	TWA	25 ppm	as Ammonia NH_3 (ACGIH)

Engineering Controls:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.
General Hygiene:	Practice good personal hygiene after using this material, especially before eating, drinking, smoking, or using the toilet.
Personal Protection Equipment:	
Eye:	Wear chemical goggles and face shield unless protected by a respirator with a full face piece. Do not wear contact lenses as they may trap fumes against the eyes and can make flushing ineffective.
Skin:	The use of gloves, boots, and aprons impermeable to the specific material handled (for Ammonia, includes Butyl, Teflon, Neoprene, and Viton) is advised to prevent skin contact, possible irritation, and skin damage.
Respiratory:	None required under normal conditions. When conditions warrant a respirator, use NIOSH approved respirator and cartridge for particulates and ammonia.
Other Protective Items:	Where splash is possible, full chemically resistant protective clothing and boots are required. Ensure that eyewash stations and safety showers are proximal to the work-station location.

	Health (Blue)	Flammability (Red)	Physical Hazard (Yellow)	PPE (White)
HMIS Classification:	3	1	0	See Above

Hazard Classification: 0 = Minimal 1= Slight 2 = Moderate 3 = Serious 4 = Severe

IX. Physical and Chemical Properties

Physical State:	Liquid	**pH:**	>12
Appearance:	Clear, colorless liquid	**Molecular Weight:**	35.05
Odor:	Pungent odor	**Odor Threshold:**	1-50 ppm
Specific Gravity:(H_2O=1)	0.94 (15% Solution); 0.92 (19% Solution); 0.90 (25% Solution); 0.89 (30.5% Solution) @ 60°F (15.5°C)	**Weight per Gallon:**	7.87 (15% Solution); 7.74 (19% Solution); 7.58 (25% Solution); 7.45 (30.5%Solution) lbs @ 60°F (15.5°C)
Vapor Density: (Air=1)	0.045 lb/cf @ 60°F (15.5°C)	**Vapor Pressure:**	276 mm Hg (19%) 629 mm Hg (29%) @ 77°F (25°C)
Boiling Point: at 14.7 psia	86°F - 138°F (30°C -58.9°C)	**Freezing/Melting Point:**	-106°F (-77°C)
Lower Explosive Limit:	16% by volume Ammonia gas	**Upper Explosive Limit:**	25% by volume Ammonia gas
Flash Point:	N/A	**Autoignition Temp:**	1,204 °F (651 °C) (vapor)
Solubility in water:	100%		
Other:			

X. Stability and Reactivity Data

Chemical Stability:	Product is stable under normal or expected use.
Conditions To Avoid:	Heat, sunlight, incompatibles, sources of ignition.
Incompatible Materials:	Corrosive to copper, brass, silver, zinc, aluminum alloys, and galvanized steel. Immediately boils when mixed with acids and is dangerous. Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine, and other halogens.

Hazardous products of Decomposition:	Burning may produce ammonia and nitrogen oxides.

XI. Toxicological Information

Routes of Entry:	☒ Eyes ☒ Skin ☒ Ingestion ☒ Inhalation
Sign and symptoms of Exposure:	Burning of the eyes, conjunctivitis, skin irritations, swelling of the eyelids and lips, dry red mouth and tongue, burning in the throat, and coughing. In more severe cases of exposure, difficulty in breathing, signs and symptoms of lung congestion, and, ultimately, death from respiratory failure due to pulmonary edema may occur.
Eye Contact:	Vapor is irritating to the eyes. Liquid will cause burns.
Ingestion:	Ingestion causes burning pain in mouth, throat, stomach, and thorax, constriction of throat, and coughing. This is soon followed by vomiting of blood or by passage of loose stools containing blood. Ingestion of 3-4 ml may be fatal.
Skin Contact:	Ammonia absorption: Because if its alkalinity and water solubility, tends to break down and disrupt the outer cell layers, permitting rapid penetration. Even so, ammonia is not a systemic poison and the effects will be limited to local effects. Contact: Causes smarting of the skin and first-degree burns on short exposure. May cause second-degree burns on long exposure.
Inhalation:	Ammonia vapors are highly irritating to throat at approximately 400 ppm. Causes edema, dyspnoea, bronchospasm, chest pain, pink frothy sputum. Inhalation of 500 ppm Ammonia considered immediately dangerous to life and health (OSHA).

Carcinogenicity:	**NPT**	Not Listed	**IARC**	Not Listed	**OSHA**	Not Regulated	
Ingredient Name:		**Species**		**Test**	**Period**	**Results**	
Ammonium Hydroxide		Rat		350 mg/kg	oral	LD50	
Comments:							

XII. Ecological Information

Ingredient Name:	**Species**	**Test**	**Period**	**Results**
Ammonium Hydroxide	Daphnia magna	32 mg/L	50 hrs	LC50
Comments:	Ammonia dissipates relatively quickly in ambient air and rapidly returns to the soil via combination with sulfate ions or washout by rainfall. Ammonia strongly adsorbs to soil, sediment particles, and colloids in water under aerobic conditions. Biodegradation of ammonia to nitrate occurs in water under aerobic conditions which results in a biological oxygen demand (BOD).			

XIII. Disposal Considerations

Waste Disposal:	Always dispose of material in accordance with local, state, and federal regulations.

XIV. Transportation Information

Proper Shipping Name:	Ammonium Hydroxide, with more than 10% but not more than 35% as ammonia.				
DOT Classification:	8				
Identification Number:	UN 2672	**Packing Group:**	III	**Other Labels:**	Corrosive
Comments:					

XV. Regulatory Information

Inventory Status:		US Regulations:	
U. S. TSCA	Yes	SARA 302 TPQ	500 lbs as ammonia NH_3
Europe EINECS	Yes	SARA 304 RQ	100 lbs as ammonia NH_3
Canadian DSL	Yes	SARA 313 List	Listed
Japan ENCS	Yes	CERCLA (RQ)	1,000 lbs for pure ammonium hydroxide
Korean KECI	Yes	RCRA 261.33	Not Listed
Philippines PICCS	Yes	CAA-112r (RMP)	20,000 lbs as ammonia NH_3 (Solution of greater than 20%)
Australian AICS	Yes		
		SARA 311/312	☒ Acute ☒ Chronic ☒ Fire ☒ Release of Pressure ☐ Reactive

International Regulations:			Other Regulations:	
Canada WHMIS	E	Corrosive	California PROP 65	No
EINECS	231-635-3	as Anhydrous Ammonia		
EINECS	215-647-6	as Aqua Ammonia		

XVI. Other Information

NSF Certification:	Aqua Ammonia manufactured at Lake Charles, LA is NSF-60 certified. Maximum use in potable water is 10 mg/L.
Other:	_____
Revision Notes:	_____

SALES OFFICE

For Product Information:
TEL: 800-535-2847
FAX: 713-957-0345

701 N. Post Oak Rd., Ste. 540
Houston, TX 77024

To Place An Order:
TEL: 800-535-2847
FAX: 713-957-0345

SAFETY DATA SHEET

PRODUCT

NALCO BT-4000

EMERGENCY TELEPHONE NUMBER(S)
(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **NALCO BT-4000**

APPLICATION : BOILER WATER TREATMENT

COMPANY IDENTIFICATION : Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 3 / 3 FLAMMABILITY : 0 / 0 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Hydroxide	1310-73-2	1.0 - 5.0

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

DANGER
Corrosive. May cause tissue damage.
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.
Wear a face shield. Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots.
Not flammable or combustible. May evolve oxides of phosphorus (POx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
Corrosive. Will cause eye burns and permanent tissue damage.

SKIN CONTACT :
Corrosive; causes permanent skin damage.

INGESTION :
Corrosive; causes chemical burns to the mouth, throat and stomach.

INHALATION :
Elevated temperatures or mechanical action may form vapors, mists or fumes which may affect various internal body systems.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

HUMAN HEALTH HAZARDS - CHRONIC :
No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :
Immediately flush eye with water for at least 15 minutes while holding eyelids open. PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT. Get immediate medical attention.

SKIN CONTACT :
Immediately flush with plenty of water for at least 15 minutes. Use a mild soap if available. For a large splash, flood body under a shower. Get immediate medical attention. Contaminated clothing, shoes, and leather goods must be discarded or cleaned before re-use.

INGESTION :
Get immediate medical attention. DO NOT INDUCE VOMITING. If conscious, washout mouth and give water to drink.

INHALATION :
Remove to fresh air, treat symptomatically. Get immediate medical attention.

NOTE TO PHYSICIAN :
Probable mucosal damage may contraindicate the use of gastric lavage. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : Will not burn: inorganic or water-based product

AUTOIGNITION TEMPERATURE : Not flammable

EXTINGUISHING MEDIA :
Not expected to burn. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
Not flammable or combustible. May evolve oxides of phosphorus (POx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Keep people away from and upwind of spill/leak. Ventilate spill area if possible. Ensure clean-up is conducted by trained personnel only. Do not touch spilled material. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

METHODS FOR CLEANING UP :
SMALL SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. LARGE SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Do not breathe vapors/gases/dust. Avoid generating aerosols and mists. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Do not mix with acids.

STORAGE CONDITIONS :
Protect product from freezing. Store the containers tightly closed. Store separately from acids. Store in suitable labeled containers.

SUITABLE CONSTRUCTION MATERIAL :
Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Substance(s)	Category:	ppm	mg/m3	Non-Standard Unit
Sodium Hydroxide	ACGIH/Ceiling		2	
	OSHA Z1/PEL		2	

ENGINEERING MEASURES :
General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

RESPIRATORY PROTECTION :
Where concentrations in air may exceed the limits given in this section or when significant mists, vapors, aerosols, or dusts are generated, an approved air purifying respirator equipped with suitable filter cartridges is recommended. Consult the respirator / cartridge manufacturer data to verify the suitability of specific devices. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
When handling this product, the use of chemical gauntlets is recommended. The choice of work glove depends on work conditions and what chemicals are handled. Please contact the PPE manufacturer for advice on what type of glove material may be suitable. Gloves should be replaced immediately if signs of degradation are observed.

SKIN PROTECTION :
Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION :
Wear a face shield with chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Use good work and personal hygiene practices to avoid exposure. Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Light yellow
ODOR	None

SPECIFIC GRAVITY	1.09 @ 77 °F / 25 °C
DENSITY	9.1 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	13.6
VISCOSITY	< 4 cps @ 72 °F / 22 °C
FREEZING POINT	< 33 °F / < 1 °C
VOC CONTENT	0 % Calculated

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of phosphorus

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: High

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	> 5,000 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs		3,750 mg/l	Product

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.
If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D002

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

The presence of an RQ component (Reportable Quantity for U.S. EPA and DOT) in this product causes it to be regulated with an additional description of RQ for road, or as a class 9 for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

LAND TRANSPORT :

Proper Shipping Name : SODIUM HYDROXIDE SOLUTION
Technical Name(s) :

UN/ID No :	UN 1824
Hazard Class - Primary :	8
Packing Group :	III
Flash Point :	Will not burn: inorganic or water-based product
Reportable Quantity (per package) :	26,315 lbs
RQ Component :	SODIUM HYDROXIDE

AIR TRANSPORT (ICAO/IATA) :

The presence of an RQ component (Reportable Quantity for U.S. EPA and DOT) in this product causes it to be regulated with an additional description of RQ for road, or as a class 9 for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

Proper Shipping Name :	SODIUM HYDROXIDE SOLUTION
Technical Name(s) :	Sodium Hydroxide
UN/ID No :	UN 1824
Hazard Class - Primary :	8
Packing Group :	III
IATA Cargo Packing Instructions :	812
IATA Cargo Aircraft Limit :	60 L (Max net quantity per package)
Reportable Quantity (per package) :	26,315 lbs
RQ Component :	SODIUM HYDROXIDE

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	SODIUM HYDROXIDE SOLUTION
Technical Name(s) :	Sodium Hydroxide
UN/ID No :	UN 1824
Hazard Class - Primary :	8
Packing Group :	III

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Sodium Hydroxide : Corrosive

CERCLA/SUPERFUND, 40 CFR 302 :
This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product. If a reportable quantity of product is released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D.C. (1-800-424-8802).

RQ Substance	RQ
Sodium Hydroxide	26,315 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 173.310 Boiler Water Additives

Limitations: no more than required to produce intended technical effect.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
This product contains the following substances listed in the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
• Sodium Hydroxide • Sodium Tripolyphosphate • Sodium Trimetaphosphate	Sec. 311

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CALIFORNIA PROPOSITION 65 :
Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

MICHIGAN CRITICAL MATERIALS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :
The following substances are disclosed for compliance with State Right to Know Laws:

Sodium Hydroxide	1310-73-2
Sodium Tripolyphosphate	7758-29-4

INTERNATIONAL CHEMICAL CONTROL LAWS :

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE
The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Nalco Internal No. F104703

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 07/06/2010
Version Number : 1.14

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **CAT-FLOC 8108 PLUS**

APPLICATION : WATER TREATMENT

COMPANY IDENTIFICATION : Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 0 / 1 FLAMMABILITY : 1 / 1 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

CAUTION
May cause irritation with prolonged contact.
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.
Wear suitable protective clothing.
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. May evolve ammonia under fire conditions. May evolve HCl under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause irritation with prolonged contact.

SKIN CONTACT :
May cause irritation with prolonged contact.

INGESTION :
Not a likely route of exposure. No adverse effects expected.

INHALATION :
Not a likely route of exposure. No adverse effects expected.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

4. FIRST AID MEASURES

EYE CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

SKIN CONTACT :
Remove contaminated clothing. Wash off affected area immediately with plenty of water. If symptoms develop, seek medical advice.

INGESTION :
Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. If symptoms develop, seek medical advice.

INHALATION :
Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

If Swallowed: Do not induce vomiting. Drink large quantities of water. Never give anything by mouth to an unconscious or convulsing person.

If in Eyes: Flood eyes with water for at least 15 minutes.

If on Skin: Wash thoroughly soap and water.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : > 200 °F / > 93.3 °C (PMCC)

EXTINGUISHING MEDIA :
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire. Water mist may be used to cool closed containers.

FIRE AND EXPLOSION HAZARD :
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. May evolve ammonia under fire conditions. May evolve HCl under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Notify appropriate government, occupational health and safety and environmental authorities. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection).

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
This product is toxic to fish. It should not be directly discharged into lakes, ponds, streams, waterways or public water supplies.

7. HANDLING AND STORAGE

HANDLING :
Do not take internally. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Avoid eye and skin contact.

STORAGE CONDITIONS :
Store separately from oxidizers. Store the containers tightly closed. Protect product from freezing.

SUITABLE CONSTRUCTION MATERIAL :
HDPE (high density polyethylene), Brass, Neoprene, Buna-N, Polyurethane, PVC, Polypropylene, Polyethylene, Stainless Steel 304, EPDM, 100% phenolic resin liner, Epoxy phenolic resin, Chlorosulfonated polyethylene rubber, Fluoroelastomer, Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Respiratory protection is not normally needed.

HAND PROTECTION :
When handling this product, the use of chemical gloves is recommended. The choice of work glove depends on work conditions and what chemicals are handled. Please contact the PPE manufacturer for advice on what type of glove material may be suitable. Gloves should be replaced immediately if signs of degradation are observed.

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Keep an eye wash fountain available. Keep a safety shower available.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is:
Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Viscous liquid
APPEARANCE	Clear Yellow
ODOR	None

SPECIFIC GRAVITY	1.018 - 1.058 @ 77 °F / 25 °C
DENSITY	8.4 - 8.8 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	6.5
VISCOSITY	1,500 - 3,200 cps @ 77 °F / 25 °C
BOILING POINT	> 212 °F / > 100 °C
VAPOR PRESSURE	Same as water
VAPOR DENSITY	Same as water
VOC CONTENT	0.00 % EPA Method 24

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of nitrogen, HCl, ammonia

11. TOXICOLOGICAL INFORMATION

The following results are for the product.

ACUTE ORAL TOXICITY :
Species: Rat
LD50: 14.6 g/kg
Test Descriptor: Product

ACUTE DERMAL TOXICITY :
Species: Rabbit
LD50: > 20 g/kg
Test Descriptor: Product

PRIMARY SKIN IRRITATION :
Species: Rabbit
Draize Score: 1 /8.0
Test Descriptor: 40% Active Ingredient

PRIMARY EYE IRRITATION :
Species: Rabbit
Draize Score: 8 /110.0
Test Descriptor: 40% Active Ingredient

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The tests for (products or similar products) were performed in clean water as set forth by USEPA (EPA/600/4-90/027). In order to evaluate the potential toxicity mitigation, the tests for (representative polymers) were performed in environmentally relevant water with dissolved organic carbon (DOC: 4.5 mg/l). The toxicity of this product is due to an external mode of action, e.g., suffocation or immobilization. In the presence of suspended material, e.g., DOC, the polymers are bound to suspended material and the bioavailability is substantially reduced. As a result, the toxicity is expected to be lower. Under normal use and discharge conditions, the LC50 values of the representative polymers tested in the presence of DOC are expected to apply to this product. However, for large spills, the clean water data is more applicable.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Bluegill Sunfish	96 hrs	1.07 mg/l	Product tested in clean water
Rainbow Trout	96 hrs	0.76 mg/l	Product tested in clean water
Zebra Danio	96 hrs	10 - 100 mg/l	Representative polymer tested in water with DOC
Inland Silverside	96 hrs	4,988.87 mg/l	Product tested in clean water

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs	49.6 mg/l		Tested with 1000 mg/l Clay
Daphnia magna	48 hrs	3.7 mg/l		Tested with 50 mg/l Clay
Daphnia magna	48 hrs	1.8 mg/l		Product tested in clean water
Mysid Shrimp (Mysidopsis bahia)	96 hrs	92 mg/l		Product tested in clean water

ADDITIONAL ECOLOGICAL DATA
NOEC on earthworm: > 1000 mg/l (representative polymer) AOX information: Product contains no organic halogens.

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.
If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: High
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Low

OTHER INFORMATION
The hazard characterization is based on the tests or potential hazard in the clean water.

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name :	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

CERCLA/SUPERFUND, 40 CFR 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 176.170 Components of paper and paperboard in contact with aqueous and fatty foods and 21 CFR 176.180 Components of paper and paperboard in contact with dry foods.

1) As a flocculant employed prior to the sheet-forming operation in the manufacture of paper and paperboard and used at a level not to exceed 10 mg/L (10 ppm) of influent water. 2) As a pigment dispersant and/or retention aid prior to the sheet-forming operation at an active polymer level not to exceed 0.5% of finished paper and paperboard with the level of residual monomer not to exceed 1 weight percent of the polymer (dry basis). 3) As a pigment dispersant in coatings at an active polymer level not to exceed 0.18% of finished paper and paperboard.

NSF INTERNATIONAL :
This product has received NSF/International certification under NSF/ANSI Standard 60 in the coagulation and flocculation category. The official name is "Poly (Diallyldimethylammonium Chloride) (pDADMAC)." Maximum product application dosage is : 50 mg/l.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CALIFORNIA PROPOSITION 65 :
Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

MICHIGAN CRITICAL MATERIALS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

INTERNATIONAL CHEMICAL CONTROL LAWS :

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE
The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 07/15/2010
Version Number : 1.14

PRODUCT NAME: CITRIC ACID, SOLUTION

MSDS NUMBER: HX17030

DATE ISSUED: 11/21/2005

SUPERSEDES: 6/22/2005

ISSUED BY: 006768

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Material Safety Data Sheet

Section 1 - Chemical Product and Company Identification

Chemical Name: Citric Acid, Solution
Product Use: For Manufacturing Use
Synonyms: 1,2,3-Propanetricarboxylic acid, 2-hydroxy-; 2-Hydroxy-1,2,3-propanetricarboxylic acid; Propane-1,2,3-tricarboxylic acid, 2-hydroxy-; beta-hydroxytricarballylic acid.

Supplier Information
Distributed by:
UNIVAR USA
17425 NE Union Hill Road
Redmond, WA 98052
425-889-3400
Emergency: 1-800-424-9300 or (703)527-3887

General Comments: FOR MANUFACTURING USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service. * * * Section 2 - Composition / Information on Ingredients

CAS #	Component	Percent
77-92-9	Citric Acid	30-50%
7732-18-5	Water	Balance

Component Information/Information on Non-Hazardous Components
This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Section 3 - Hazards Identification

Emergency Overview
Citric Acid Solution is a clear or yellow to brown liquid, with a faint sugary odor. Citric Acid is moderately to severely irritating to eyes, and moderately irritating to skin, and respiratory tract. Citric Acid Solution is not combustible. Use methods suitable for containing (diking) the solution in case of fire or spill. Firefighters should wear full protective equipment when fighting a fire involving this product.

Hazard Statements
DANGER! THIS SOLUTION CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION OR BURNS. MAY CAUSE ALLERGIC SKIN SENSITIZATION REACTION. Do not breath or ingest mists, vapors, or aerosols. Do not allow contact with eyes, skin, or clothing. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Potential Health Effects: Eyes
This solution may cause severe irritation to the eyes, with symptoms that

include redness, tearing, and pain. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations.

Potential Health Effects: Skin
This product may cause moderate irritation of the skin. Citric Acid may cause allergic contact dermatitis with prolonged or repeated contact in sensitive individuals.

Potential Health Effects: Ingestion
Citric Acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, and abdominal pain. Concentrated solutions may cause necrotic and ulcerative lesions on oral mucous membranes. Chronic ingestion of high concentration Citric Acid can result in erosion of tooth enamel. Repeated ingestion of this solution can result in sensitization to the sun, causing sunburn.

Potential Health Effects: Inhalation
Aerosols and mists from solutions may cause mild to moderate irritation of the nose and throat. Overexposure could cause coughing, sneezing, and labored breathing.

Other Potential Health Effects
Chronic, high concentration overexposure to Citric Acid can result in a reduction of plasma calcium concentration, which can lead to cardiac arrhythmias, reduced cardiac output and, in severe cases, death.

HMIS Ratings: Health Hazard: 2* Fire Hazard: 0 Physical Hazard: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Section 4 - First Aid Measures

First Aid: Eyes
Immediately flush the contaminated eye with plenty of water for 15 minutes. Get medical attention if symptoms of pain, swelling, or tearing exist after flushing the eyes.

First Aid: Skin
For skin contact, immediately wash extremely thoroughly with soap and water. Get medical attention if irritation develops or persists.

First Aid: Ingestion
DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

First Aid: Inhalation
Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Notes to Physician
There is no specific antidote. Care is symptomatic and supportive.

Section 5 - Fire Fighting Measures

Flash Point: Not applicable.
Method Used: Not applicable.
Upper Flammable Limit (UEL Not applicable.
Lower Flammable Limit (LEL): Not applicable.
Auto Ignition: Not applicable.
Flammability Classification: Not applicable.
Rate of Burning: Not applicable.

Not considered flammable although if allowed to evaporate to dryness, residue may burn in presence of strong ignition source.

Hazardous Combustion Products
Applies to residue: Carbon dioxide and carbon monoxide are normal products of combustion. Incomplete combustion may produce irritating fumes and acrid smoke.

Extinguishing Media
Water, foam, dry chemical, or carbon dioxide. Dike and collect water used to fight fire; runoff may cause damage.

Fire Fighting Equipment/Instructions
Firefighters should wear full protective clothing including self contained breathing apparatus.

NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0 Other:
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Section 6 - Accidental Release Measures

Containment Procedures
Stop the flow of material, if this can be done without risk. Contain the discharged solution; dike runoff to prevent spill from contaminating storm drains, sewers, soil or groundwater waterways.

Clean-Up Procedures
Wear appropriate protective equipment and clothing during clean-up. Addition of sodium bicarbonate or lime (soda ash) will neutralize Citric Acid and precipitate calcium citrate. Test area of spill with pH paper to assure neutralization. Thoroughly wash the area after a spill clean-up with large quantities of water, flush to drain.

Evacuation Procedures
Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep incompatible materials away from spilled solution. In case of large spills, follow all facility emergency response procedures.

Special Procedures
Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

Section 7 - Handling and Storage

Handling Procedures
All employees who handle this material should be trained to handle it safely. Do not breathe vapors or mists. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.

Storage Procedures
Keep container tightly closed when not in use. Keep containers upright, do not drop, roll or skid. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of fire- and corrosion-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers).
Empty containers may contain residual particulates; therefore, empty

containers should be handled with care. Never store food, feed, or drinking water in containers which held this product. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored. Wipe down area of use periodically as area can become sticky.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines
A: General Product Information
No exposure guidelines have been established.
B: Component Exposure Limits
ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

Engineering Controls
Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement.

PERSONAL PROTECTIVE EQUIPMENT
The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face
Faceshields and goggles should be worn when working with solutions of Citric Acid. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin
Use impervious gloves. Butyl rubber, natural rubber, neoprene, nitrile rubber, polyethylene, or PVC are recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory
None required where adequate ventilation conditions exist. If airborne concentration is high, use an appropriate respirator with acid dust/mist pre-filters. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Personal Protective Equipment: General
Have an eyewash fountain and safety shower available in the work area. Use good hygiene practices when handling this material including changing and laundering work clothing after use. Wash hands thoroughly after handling material. Do not eat, drink, or smoke in work areas.

Section 9 - Physical & Chemical Properties

Physical Properties: Additional Information
The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	Colorless or yellow to brown
Odor:	Slight sugar odor.
Physical State:	Liquid
pH:	Approx 2.5 or lower
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Boiling Point:	104 deg C (219 deg F)

Melting Point:	Not applicable.
Solubility (H20):	162 g/100 mL water at 25 deg C
Specific Gravity:	1.24 @ 25 deg C (77 deg F)
Freezing Point:	0 deg C (32 deg F)
Particle Size:	Not applicable.
Softening Point:	Not applicable.
Evaporation Rate:	Similar to water.
Viscosity:	7.0 centipoise at 25 deg C
Bulk Density:	Not applicable.
Percent Volatile:	Not available.
Molecular Weight:	192.13 (Citric Acid, Anhydrous)
Chemical Formula:	C6H8O7 (Citric Acid, Anhydrous)

Section 10 - Chemical Stability & Reactivity Information

Chemical Stability
Stable under normal conditions. Dilute aqueous solutions of Citric Acid may ferment if left standing for long period of time.

Chemical Stability: Conditions to Avoid
Heat, moisture and incompatible materials.

Incompatibility
Potentially explosive reaction with metal nitrates, strong bases, and oxidizers. Citric Acid is incompatible with reducing agents.
Citric Acid Solution is corrosive to brass, copper, zinc, aluminum and their alloys, lead, cast iron and steel (not stainless steel).

Hazardous Decomposition
Residue: Carbon dioxide and carbon monoxide are normal products of combustion. Incomplete combustion may produce irritating fumes and acrid smoke.

Hazardous Polymerization
Hazardous polymerization will not occur.

Section 11 - Toxicological Information

Acute and Chronic Toxicity
A: General Product Information
Citric Acid has been reported to have allergenic properties, and might cause allergic contact dermatitis and sensitization to the sun. Irritation of the skin, eyes, and gastrointestinal tract may occur, but should not require extensive therapy beyond dilution/irrigation. Vapors and solution may cause severe irritation to the eyes, with symptoms that include redness, tearing, and pain. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations. This product may cause moderate irritation of the skin. Citric Acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, abdominal pain. Concentrated solutions may cause necrotic and ulcerative lesions on oral mucous membranes. Dusts and mists from solutions may cause mild to moderate irritation to the nose and throat. Higher concentrations could cause coughing, sneezing, and labored breathing.
Chronic, high concentration overexposure to Citric Acid can result in a reduction of plasma calcium concentration, which can lead to cardiac arrhythmias, reduced cardiac output and, in severe cases, death.

B: Component Analysis - LD50/LCso
Citric Acid (77-92-9)
LD50 (Oral-Rat) 3 gm/kg; LD50 (Oral-Mouse) 5040 mg/kg: Lungs, Thorax, or Respiration changes; Musculoskeletal changes; LD50 (Subcutaneous-Rat) 5500 mg/kg; LD50 (Subcutaneous-Mouse) 2700 mg/kg: Lungs, Thorax, or Respiration changes; Musculoskeletal changes; LD50 (Intraperitoneal-Rat) 290 mg/kg; LD50 (Intraperitoneal-Mouse) 903 mg/kg; LD50 (Intravenous-Mouse) 42 mg/kg: Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: cyanosis; Gastrointestinal: changes in structure or function of

B: Component Analysis - TDLo/TCLo/LD/LDLo
Citric Acid (77-92-9)
LDLo (Oral-Rabbit) 7 gm/kg: Behavioral: tremor, convulsions or effect on seizure threshold, muscle contraction or spasticity

Carcinogenicity
A: General Product Information
No information identified.

B: Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology
No information available.

Neurotoxicity
Has not been identified.

Mutagenicity
Citric Acid would not be expected to be genotoxic at physiological concentrations because it is a normal metabolite. It was not mutagenic in Salmonella typhimurium, and did not induce chromosome aberrations in cultured Chinese hamster fibroblast cells.

Teratogenicity
Citric Acid did not cause reproductive effects when tested in experimental animals. The sodium salt did not cause birth defects in rats. When given to rats at 1.2% in the diet over 2 generations, it did not affect reproduction. It did not affect litter size or survival of mice with prenatal exposure to up to 5% in the diet.

Other Toxicological Information
Persons with pre-existing eye, skin, respiratory, or allergic conditions may be more sensitive.

Section 12 - Ecological Information

Ecotoxicity
A: General Product Information
Water Solubility = 59.2% (20 deg C); 84% (100 deg C). Biological Oxygen Demand (BOD): 40%, 5 days; 60%, 10-20 days. Citric Acid biodegrades quite rapidly. It is dangerous to aquatic life in high concentrations. Lowers pH in water but does not dissociate to any great extent.
Food Chain Concentration Potential: Very Low

B: Ecotoxicity
TLm (immersion-shore crab) 48 hours = 160 ppm (salt water); TLm (immersion-goldfish) 4 hr = 894 ppm (fresh water/ killed); ECo (Pseudomonas putida bacteria) 16 hours = >10,000 mg/L; EC0 (Microcystis aeruginosa algae) 8 days = 80 mg/L; ECo (Scenedesmus quadricauda green algae) 7 days = 640 mg/L; ECo(Entosiphon sulcatum protozoa) 72 hours = 485 mg/L; ECo (Uronema parduczi Chatton-Lwoff protozoa) = 622 mg/L; LD0 (Daphnia magna) = 80 mg/L, long-time exposure in soft water; LD0 (goldfish) = 625 mg/L, long-time exposure in hard water; LD100 (goldfish) = 894 mg/L, long-time exposure in hard water; LD100 (Daphnia magna) 120 mg/L long-time exposure in soft water; toxic (Daphnia) = 100 mg/L; period of survival at pH 4.0 (goldfish) 48 hours = 894 mg/L; period of survival at pH 4.5 (goldfish) 48 hours = 625 mg/L

Environmental Fate
Citric Acid is a naturally occurring chemical and is biodegradable.
Octanol/Water Partition Coefficient Log P (oct): -1.72.

Section 13 - Disposal Considerations

US EPA Waste Number & Descriptions
A: General Product Information
Concentrated solutions may be considered D002 wastes (corrosive) by RCRA. Wastes should be tested prior to disposal to determine classification.

B: Component Waste Numbers
No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions
Review federal, provincial, and local government requirements prior to disposal.

Section 14 - Transportation Information

US DOT Information
Shipping Name: Not Regulated

Section 15 - Regulatory Information

US Federal Regulations
A: General Product Information
No additional information.

B: Component Analysis
None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Citric Acid. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Citric Acid	77-92-9	No	No	No	Yes	Yes

State Regulations
A: General Product Information
Other state regulations may apply.

B: Component Analysis - State Citric Acid and Water are listed as follows: NJ4: New Jersey other (included in 5 predominant ingredients >1%); PA3: Pennsylvania (non-hazardous - present at 3% or greater)

Component	CAS #	CA	FL	MA	MN	NJ	PA
Citric Acid	77-92-9	No	No	No	No	Yes	Yes

Other Regulations
A: General Product Information No additional information.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Citric Acid	77-92-9	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL
The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Citric Acid	77-92-9	1% item 409 (80)

ANSI Labeling (Z129.1):
DANGER! CORROSIVE. CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION OR BURNS. MAY CAUSE ALLERGIC SKIN SENSITIZATION REACTION. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing aerosols or mists.

Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep from contact with clothing. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. IN CASE OF FIRE: Use water fog, dry chemical, CO2, or "alcohol" foam. IN CASE OF SPILL: Neutralize spill and wash area. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

---------- FOR ADDITIONAL INFORMATION ----------

CONTACT: MSDS COORDINATOR UNIVAR USA INC.

DURING BUSINESS HOURS, PACIFIC TIME (425)889-3400

---------- NOTICE ----------

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* * * E N D O F M S D S * * *

SAFETY DATA SHEET

PRODUCT

PermaClean® PC-77

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **PermaClean® PC-77**

APPLICATION : REVERSE OSMOSIS CLEANER

COMPANY IDENTIFICATION : Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 0 / 1 FLAMMABILITY : 1 / 1 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

CAUTION
May cause irritation with prolonged contact.
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.
Wear suitable protective clothing.
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause irritation with prolonged contact.

SKIN CONTACT :
May cause irritation with prolonged contact.

INGESTION :
Not a likely route of exposure. There may be irritation to the gastro-intestinal tract with nausea and vomiting.

INHALATION :
Not a likely route of exposure. Repeated or prolonged exposure may irritate the respiratory tract.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

HUMAN HEALTH HAZARDS - CHRONIC :
No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :
Immediately flush eye with water for at least 15 minutes while holding eyelids open. If symptoms develop, seek medical advice.

SKIN CONTACT :
Flush with large amounts of water. Use soap if available. If symptoms develop, seek medical advice.

INGESTION :
Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. If symptoms develop, seek medical advice.

INHALATION :
Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : None

EXTINGUISHING MEDIA :
Use extinguishing media appropriate for surrounding fire. This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable.

FIRE AND EXPLOSION HAZARD :
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Do not touch spilled material. Ventilate spill area if possible.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water., Do not allow material to contaminate ground water system., Prevent material from entering sewers or waterways.

7. HANDLING AND STORAGE

HANDLING :
Do not take internally. Ensure all containers are labeled. Keep the containers closed when not in use. Avoid eye and skin contact. Keep away from acids and oxidizing agents.

STORAGE CONDITIONS :
Store the containers tightly closed.

SUITABLE CONSTRUCTION MATERIAL :
HDPE (high density polyethylene), Stainless Steel 304, Stainless Steel 316L, Neoprene, Buna-N, EPDM, Polyethylene, Polypropylene, PVC, 100% phenolic resin liner, Chlorosulfonated polyethylene rubber, Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

UNSUITABLE CONSTRUCTION MATERIAL :
Mild steel, Polyurethane, Epoxy phenolic resin, Brass, Fluoroelastomer

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended. The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

RESPIRATORY PROTECTION :
Where concentrations in air may exceed the limits given in this section or when significant mists, vapors, aerosols, or dusts are generated, an approved air purifying respirator equipped with suitable filter cartridges is recommended. Consult the respirator / cartridge manufacturer data to verify the suitability of specific devices. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
When handling this product, the use of chemical gloves is recommended. The choice of work glove depends on work conditions and what chemicals are handled. Please contact the PPE manufacturer for advice on what type of glove material may be suitable. Gloves should be replaced immediately if signs of degradation are observed.

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear safety glasses with side-shields.

HYGIENE RECOMMENDATIONS :
Use good work and personal hygiene practices to avoid exposure. Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is: Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Straw-colored
ODOR	None

SPECIFIC GRAVITY	1.18
DENSITY	9.84 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	3.7
VOC CONTENT	0 % Calculated

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Extremes of temperature

MATERIALS TO AVOID :
None known

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of nitrogen

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	320 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs	310 mg/l		Product

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.
If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

CERCLA/SUPERFUND, 40 CFR 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

NSF INTERNATIONAL :
This product has received NSF/International certification under NSF/ANSI Standard 60 in the "Other" category. The official name is "Miscellaneous Water Supply Products." Membrane cleaner. This product is designed to be used off-line and flushed out prior to using the system for drinking water.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
This product may contain trace levels (<0.1% for carcinogens, <1% all other substances) of the following substance(s) listed under the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
• Sodium Bisulfite	Sec. 311

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CALIFORNIA PROPOSITION 65 :
Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

MICHIGAN CRITICAL MATERIALS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

INTERNATIONAL CHEMICAL CONTROL LAWS :

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE
The substance(s) in this preparation are included in or exempted from the EINECS or ELINCS inventories

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

NEW ZEALAND
All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996,and are listed on or are exempt from the New Zealand Inventory of Chemicals.

PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 08/05/2010
Version Number : 1.9

SAFETY DATA SHEET

PRODUCT

PermaClean® PC-98

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **PermaClean® PC-98**

APPLICATION : REVERSE OSMOSIS CLEANER

COMPANY IDENTIFICATION : Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 1 / 1 FLAMMABILITY : 0 / 0 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Tetrasodium EDTA	64-02-8	1.0 - 5.0

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

CAUTION
May cause irritation with prolonged contact.
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Protect product from freezing.
Wear suitable protective clothing.
Not flammable or combustible.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause irritation with prolonged contact.

SKIN CONTACT :
May cause irritation with prolonged contact.

INGESTION :
Not a likely route of exposure. No adverse effects expected.

INHALATION :
Not a likely route of exposure. No adverse effects expected.

HUMAN HEALTH HAZARDS - CHRONIC :
No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

SKIN CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

INGESTION :
Get medical attention. Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink.

INHALATION :
Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : Not flammable

EXTINGUISHING MEDIA :
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
Not flammable or combustible.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Ventilate spill area if possible.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Do not breathe vapors/gases/dust. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled.

STORAGE CONDITIONS :
Store in suitable labeled containers. Store the containers tightly closed. Store separately from acids. Protect product from freezing.

SUITABLE CONSTRUCTION MATERIAL :
Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Where concentrations in air may exceed the limits given in this section, the use of a half face filter mask or air supplied breathing apparatus is recommended. A suitable filter material depends on the amount and type of chemicals being handled. Consider the use of filter type: Organic vapor cartridge. with a Particulate pre-filter. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
When handling this product, the use of chemical gloves is recommended. The choice of work glove depends on work conditions and what chemicals are handled, but we have positive experience under light handling conditions using gloves made from PVC . Gloves should be replaced immediately if signs of degradation are observed. Breakthrough time not determined as preparation, consult PPE manufacturers.

SKIN PROTECTION :
Wear standard protective clothing. See general advice.

EYE PROTECTION :
When handling this product, the use of safety glasses with side shields is recommended.

HYGIENE RECOMMENDATIONS :
Use good work and personal hygiene practices to avoid exposure. Consider the provision in the work area of a safety shower and eyewash. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Dispose of contaminated clothing as hazardous waste.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is:
Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Opaque
ODOR	Slight

SPECIFIC GRAVITY	1.02 @ 60.0 °F / 15.5 °C
DENSITY	8.5 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	12.0
FREEZING POINT	50 °F / 10 °C
VOC CONTENT	0.0 % Calculated

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Avoid extremes of temperature. Freezing temperatures.

MATERIALS TO AVOID :
Acids Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: None known

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product, unless otherwise indicated.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Fathead Minnow	96 hrs	48 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Ceriodaphnia dubia	48 hrs	25 mg/l		Product

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.
If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	30 - 50%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

Empty drums should be taken for recycling, recovery, or disposal through a suitably qualified or licensed contractor.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Tetrasodium EDTA : Irritant

CERCLA/SUPERFUND, 40 CFR 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

NSF INTERNATIONAL :
This product has received NSF/International certification under NSF/ANSI Standard 60 in the Membrane Cleaner category. The official name is "Miscellaneous Water Supply Products." This product is designed to be used off-line and must be flushed and drained before being placed into service. The pH of the influent and effluent water should be monitored to ensure that all traces of the product have been removed before placing into service.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
This product may contain trace levels (<0.1% for carcinogens, <1% all other substances) of the following substance(s) listed under the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
• Formaldehyde	Sec. 311

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
This product may contain trace levels (<0.1% for carcinogens, <1% all other substances) of the following substance(s) listed under the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
• Formaldehyde	Sec. 111, Sec. 112

CALIFORNIA PROPOSITION 65 :
Substances known to the State of California to cause cancer and/or reproductive toxicity are present as an impurity or residue.

MICHIGAN CRITICAL MATERIALS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :
The following substances are disclosed for compliance with State Right to Know Laws:

Formaldehyde 50-00-0

INTERNATIONAL CHEMICAL CONTROL LAWS :

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE
The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 04/27/2010
Version Number : 1.10

SAFETY DATA SHEET

1. Identification

Product identifier **Sodium Bisulfite 40%**

Other means of identification

SDS Number 322014-03

Recommended use Processing aid for industrial applications.

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Company name Skyhawk Chemicals Inc

Address 701 N Post Oak Rd., Ste. 540
Houston, TX 6677024106

Main Telephone Number 1-713-957-2200

Website www.skyhawkchemicals.com

E-mail order@skyhawkchemicals.com

Emergency #: CHEMTREC 1-800-424-9300

CHEMTREC Acct# 721839

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards

Acute toxicity, oral	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement Harmful if swallowed. Causes skin irritation. Causes serious eye damage.

Precautionary statement

Prevention Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear eye protection/face protection. Wear protective gloves.

Response If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin: Wash with plenty of water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

Storage Store away from incompatible materials. Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in accordance with local/regional/national/international regulations.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information 31.5% of the mixture consists of component(s) of unknown acute dermal toxicity. 31.5% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 31.5% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Sodium Bisulfite		7631-90-5	38 - 42
Other components below reportable levels			58 - 62

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation
Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact
Remove contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Ingestion
Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

Most important symptoms/effects, acute and delayed
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Skin irritation. May cause redness and pain.

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
Move containers from fire area if you can do so without risk.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up
This product is miscible in water.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions
Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling
Do not get this material in contact with eyes. Do not taste or swallow. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Store in tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. ACGIH Threshold Limit Values

Components	Type	Value
Sodium Bisulfite (CAS 7631-90-5)	TWA	5 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Sodium Bisulfite (CAS 7631-90-5)	TWA	5 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station and safety shower. It is recommended that users of this product perform a risk assessment to determine the appropriate PPE.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Hand protection Wear appropriate chemical resistant gloves.

Other Wear appropriate chemical resistant clothing.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance Clear.

Physical state Liquid.

Form Liquid.

Color Colorless to Pale Yellow

Odor Pungent.

Odor threshold Not available.

pH 3.5 - 5

Melting point/freezing point Not available.

Initial boiling point and boiling range 217.4 °F (103 °C)

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure <= 32 mm Hg @ 25°C

Vapor density > 1

Relative density	Not available.
Solubility(ies)	
Solubility (water)	Dilutable.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Flash point class	Non-flammable.
Oxidizing properties	Not oxidizing.
Specific gravity	1.31 - 1.38 @ 25°C

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Contact with incompatible materials.
Incompatible materials	Oxidizing agents.
Hazardous decomposition products	Sulfur oxides. Toxic fumes.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye damage.
Ingestion	Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity	Harmful if swallowed.
Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Causes serious eye damage.
Respiratory or skin sensitization	
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Sodium Bisulfite (CAS 7631-90-5) 3 Not classifiable as to carcinogenicity to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
Sodium Bisulfite 40%			
Aquatic			
Fish	LC50	Fish	806.7102 mg/l, 96 hours estimated
Components		**Species**	**Test Results**
Sodium Bisulfite (CAS 7631-90-5)			
Aquatic			
Fish	LC50	Western mosquitofish (Gambusia affinis)	240 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN2693
UN proper shipping name Bisulfites, aqueous solutions, n.o.s. (Sodium Bisulfite)
Transport hazard class(es)
Class 8
Subsidiary risk -
Label(s) 8
Packing group III
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Special provisions IB3, T7, TP1, TP28
Packaging exceptions 154
Packaging non bulk 203
Packaging bulk 241
Reportable Quantity for Sodium Bisulfite = 5000 lbs.

IATA

UN number UN2693
UN proper shipping name Bisulphites, aqueous solution, n.o.s. (Sodium Bisulfite)
Transport hazard class(es)
Class 8

Subsidiary risk	-
Packing group	III
Environmental hazards	No.
ERG Code	8L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

UN number	UN2693
UN proper shipping name	BISULPHITES, AQUEOUS SOLUTION, N.O.S. (Sodium Bisulfite)
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-B
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Toxic Substances Control Act (TSCA) All components of the mixture on the TSCA 8(b) inventory are designated “active”.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Sodium Bisulfite (CAS 7631-90-5) Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	Yes
Classified hazard categories	Acute toxicity (any route of exposure) Skin corrosion or irritation Serious eye damage or eye irritation

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

US state regulations

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	05-18-2015
Revision date	02-18-2019
Version #	05
HMIS® ratings	Health: 3 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 3 Flammability: 0 Instability: 0

Disclaimer

The information provided in this Safety Data Sheet has been obtained from sources believed to be reliable. Skyhawk Chemicals Inc., provides no warranties, either expressed or implied and assumes no responsibility for the accuracy or completeness of the data contained herein. This information is offered for your information, consideration, and investigation. You should satisfy yourself that you have all current data relevant to your particular use. Skyhawk Chemicals Inc., knows of no medical condition, other than those noted on this Safety Data Sheet, which are generally recognized as being aggravated by exposure to this product.

Revision information

This document has undergone significant changes and should be reviewed in its entirety.

Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 08/11/2016 Version 4 Date Reviewed: 08/11/2016

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

· **Product Identifier: Liquid Caustic Soda 20-25%**

· **Synonyms:** Sodium Hydroxide 20-25%

· **Product Use:**
Strong chemical base in the manufacture of pulp and paper, textiles, drinking water, soaps and detergents.

· **Manufacturer/Supplier:**
Skyhawk Chemicals, Inc.
701 N. Post Oak Rd., Ste. 540
Houston, TX 77024
Phone: 713-957-2200 or 800-535-2847, Fax: 713-957-0345
E-Mail: order@skyhawkchemicals.com

· **Emergency Telephone Number:**
In case of a chemical emergency, contact CHEMTREC (24 hrs) at:
+1 (800) 424-9300 (USA), ACCT#: CCN721839

Section 2: Hazards Identification

· **Hazard Classification:**

GHS05

Skin Corr. 1A H314 Causes severe skin burns and eye damage.

Eye Dam. 1 H318 Causes serious eye damage.

· **Signal Word:** DANGER

· **Precautionary Statements:**

P260	Do not breathe mist.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309	If exposed or if you feel unwell:
P310	Immediately call a doctor.
P501	Dispose of contents/container in accordance with local regulations.

· **NFPA Ratings (scale 0 - 4):**

Health = 3
Fire = 0
Reactivity = 0

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Product Identifier: Liquid Caustic Soda 20-25%

(Contd. from Page 1)

· **Additional Information:**
If you do not understand the hazards or safety precautions described in this data sheet, contact your supervisor or safety administrator before handling this product.

Section 3: Composition/Information on Ingredients

· **Dangerous Components:**

· CAS No. Description	%
1310-73-2 sodium hydroxide	20-25%
Skin Corr. 1A, H314	

Section 4: First Aid Measures

· **General information:**
Rescue personnel must wear appropriate protective equipment during removal of victims from contaminated areas.

· **After Inhalation:**
Remove victim to fresh air.
Administer oxygen if breathing is difficult.
Administer artifical respiration if breathing has stopped.
Onset of symptoms may be delayed up to 48 hours.
Get immediate medical attention.

· **After Skin Contact:**
Remove contaminated clothing and shoes. Wash affected area with soap and water.
Use caution to avoid spreading contamination while washing.
Delayed skin damage is possible if product is not completely washed off.
Get immediate medical attention.

· **After Eye Contact:**
In case of accidental contact, immediately flush eyes with water.
Hold eyelids open to ensure adequate flushing.
Remove contact lenses, if present and easy to do. Continue rinsing.
Get immediate medical attention.

· **After Swallowing:**
Rinse mouth.
Administer 1-2 glasses of water to dilute ingested material.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.
Get immediate medical attention.

· **Most Important Symptoms and Effects:** No further relevant information available.

Section 5: Firefighting Measures

· **Suitable Extinguishing Agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray.

· **Special Firefighting Hazards:** No special firefighting hazards expected.

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Product Identifier: Liquid Caustic Soda 20-25%

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· **Protective Equipment:**
In the event of a fire, wear a NIOSH (USA) or CEN (EU) approved self-contained breathing apparatus (SCBA) and full protective clothing.

· **Additional Information:** Evacuate all non-essential personnel from the danger area.

Section 6: Accidental Release Measures

· **Personal Precautions, Protective Equipment and Emergency Procedures:**
In case of a spill or other accidental release of this material, contact your supervisor, safety administrator, or emergency response team immediately.
Restrict access to keep out unauthorized or unprotected personnel.
Stay upwind of spilled material.
Wear appropriate personal protective equipment during all clean-up activities. See Section 8 for more information.
Avoid inhalation and direct contact.
All clean-up personnel must be properly trained.

· **Environmental Precautions:**
Keep spilled material out of sewage/drainage systems and waterways.
This product contains a U.S. EPA Reportable Quantity (RQ) substance. If amounts exceeding the Reportable Quantity are released, notification of the National Response Center +1 (800) 424-8802 is required. See Section 15 for more information.

· **Methods for Containment and Clean-Up:**
Secure the source of the leak if conditions are safe.
Use neutralizing agent.
Collect using an appropriate absorbent material such as clay or sand.
Place waste in an appropriate container for disposal.
Use care during clean-up to avoid exposure to the material and injury from broken containers.

Section 7: Handling and Storage

· **Precautions for Safe Handling:**
Avoid inhalation and direct contact.
Wear appropriate personal protective equipment.
Do not mix with acids, ammonia, alcohol, ethers or hydrocarbons.

· **Conditions for Safe Storage:**
Store in closed, properly labeled containers.
Protect containers from heat, physical damage, ignition sources and incompatible materials.
Have emergency equipment for fires and spills readily available.

· **Additional Information:**
If you do not understand the hazards or safety precautions described in this data sheet, contact your supervisor or safety administrator before handling this product.

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Safety Data Sheet
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Product Identifier: Liquid Caustic Soda 20-25%

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Section 8: Exposure Controls/Personal Protection

· **Occupational Exposure Limits:**

1310-73-2 sodium hydroxide

PEL (USA)	Eight-Hour Value: 2 mg/m³
REL (USA)	Ceiling Limit Value: 2 mg/m³
TLV (USA)	Ceiling Limit Value: 2 mg/m³
EL (Canada)	Ceiling Limit Value: 2 mg/m³
EV (Canada)	Ceiling Limit Value: 2 mg/m³
WEL (Great Britain)	Short-Term Value: 2 mg/m³

· **Exposure Controls:** Ensure emergency eyewash and shower facilities are available.

· **General Protective and Hygienic Measures:**
Wash thoroughly after handling.
Follow all safety precautions, posted signs and warnings.
Do not inhale gases / fumes / aerosols.
Avoid contact with the eyes and skin.

· **Respiratory Protection:**
An industrial hygiene risk assessment is required to determine appropriate respiratory protection.
An air-purifying respirator may be appropriate under limited exposure conditions.
Perform a respirator fit/seal check after donning.
Protection provided by air-purifying respirators is limited.
Wear a self-contained breathing apparatus (SCBA) if there is a potential for uncontrolled release, exposure levels are not known, or in other circumstances where air-purifying respirators may not provide adequate protection.

· **Hand Protection:**

Chemical resistant gloves.

Work gloves may be worn over chemical resistant gloves.
Wear a second pair of chemical resistant gloves for added protection.
Tape gloves to coveralls or suit, if worn.
Use caution when removing gloves to avoid exposure to hazardous chemicals.

· **Eye/Face Protection:**

Safety glasses with side shields.

Splash goggles/mono-goggles recommended during tasks with high potential for exposure.

· **Body Protection:**
Lab coat recommended for small scale operations.
Tasks with a high probability for splashing or skin contact may require:
Chemical resistant coveralls or apron.
Heavy duty chemical resistant boots.

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Product Identifier: Liquid Caustic Soda 20-25%

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· **Additional Information:**
If unusual exposures are expected, an industrial hygiene review of work practices, engineering controls and personal protective equipment is recommended.

Section 9: Physical/Chemical Properties

· **Form:**	Liquid
· **Color:**	Colorless
· **Odor:**	Odorless
· **pH Value at 20 °C (68 °F):**	>12
· **Boiling Point:**	120 °C (248 °F)
· **Flash Point:**	Not applicable.
· **Vapor Pressure at 20 °C (68 °F):**	23 hPa (17 mm Hg)
· **Density at 20 °C (68 °F):**	1.35 g/cm³ (11.266 lbs/gal)

Section 10: Stability and Reactivity

· **Chemical Stability/Reactivity:** Stable if used and stored according to the specifications listed below.

· **Conditions to Avoid:**
Keep away from heat, sparks and open flames.
Keep away from incompatible materials.

· **Possibility of Hazardous Reactions/Incompatible Materials:**
Keep away from strong oxidizers.
Keep away from halogenated compounds.
Do not mix with acids, ammonia, alcohol, ethers or hydrocarbons.

· **Hazardous Decomposition Products:** No data available.

Section 11: Toxicological Information

· **Acute Toxicity:** Based on available data, the classification criteria are not met.

· **Relevant LD/LC50 Values:**

1310-73-2 sodium hydroxide
Oral LD50 2000 mg/kg (rat)

· **Skin Irritation:**
Causes severe skin burns and eye damage.
Causes severe skin burns and eye damage.

· **Eye Irritation:**
Causes severe skin burns and eye damage.
Causes serious eye damage.

· **Respiratory Irritation:** Corrosive to the respiratory tract.

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· **Sensitization/Allergic Reaction:** No data available.

Section 12: Ecological Information

· **Aquatic Toxicity:** No data available.

· **Persistence and Degradability:** No data available.

· **Bioaccumulative Potential:** No data available.

Section 13: Disposal Considerations

· **Disposal Instructions:**
Keep spilled material out of sewage/drainage systems and waterways.
Maximize product recovery for reuse or recycling.
Waste materials may be hazardous due to the pH/corrosivity.
Dispose of waste in accordance with applicable laws and regulations.

· **Additional Information:**
It is the responsiblity of the product user to determine at the time of disposal whether a material containing or derived from this product should be classified as hazardous waste.

Section 14: Transport Information

· **UN Number:**

· **DOT, ADR, IMDG, IATA** UN1824

· **UN Proper Shipping Name:**

· **DOT:** Sodium hydroxide solution

· **ADR:** 1824 Sodium hydroxide solution

· **IMDG, IATA** SODIUM HYDROXIDE SOLUTION

· **Transport Hazard Class(es):**

· **DOT:**

· **Class:** 8 Corrosive substances

· **Label:** 8

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Product Identifier: Liquid Caustic Soda 20-25%

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· **ADR, IMDG, IATA**

· **Class:**	8 Corrosive substances
· **Label:**	8
· **Packing Group:**	
· **DOT, ADR, IMDG, IATA**	II
· **Environmental Hazards:**	Not applicable.
· **Marine Pollutant:**	No
· **Special Precautions:**	Warning: Corrosive substances
· **Danger Code (Kemler):**	80
· **EMS Number:**	F-A,S-B
· **Segregation Groups:**	Alkalis
· **Additional Information:**	Shippers must consult transportation regulations for packaging instructions, quantity limitations and other regulatory information applicable to the desired mode of transport.
· **DOT:**	
· **Quantity Limitations:**	On passenger aircraft/rail: 1 L On cargo aircraft only: 30 L
· **Remarks:**	This product contains a U.S. EPA Reportable Quantity (RQ) substance. If amounts exceeding the Reportable Quantity are released, notification of the National Response Center +1 (800) 424-8802 is required. See Section 15 for more information. . Shippers must consult transportation regulations for packaging instructions, quantity limitations and other regulatory information applicable to the desired mode of transport.
· **ADR:**	
· **Excepted Quantities (EQ):**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **Tunnel Restriction Code:**	E
· **IMDG:**	
· **Limited Quantities (LQ):**	1L
· **Excepted Quantities (EQ):**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml

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Product Identifier: Liquid Caustic Soda 20-25%

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*
Section 15: Regulatory Information

· **U.S. Superfund Amendments & Reauthorization Act (SARA) 355 (Extremely Hazardous Substances):**
None of the ingredients are listed.

· **U.S. Superfund Amendments & Reauthorization Act (SARA) 313 (Specific Toxic Chemical Listings):**
None of the ingredients is listed.

· **U.S. Environmental Protection Agency Reportable Quantity:**
1310-73-2 sodium hydroxide: 1,000 lbs.

· **U.S. Toxic Substances Control Act (TSCA):**
All ingredients are listed.

· **California Proposition 65 Carcinogens:**
Materials used in the manufacturing process may result in contamination with trace quantities (<0.0001%) of various metals listed under Proposition 65.

None of the ingredients is listed.

· **Canadian Domestic Substances List (DSL):**
All ingredients are listed.

· **Canadian Ingredient Disclosure List (limit 0.1%)**
None of the ingredients are listed.

· **Canadian Ingredient Disclosure List (limit 1%):**
1310-73-2 sodium hydroxide

· **Container Labeling According to Regulation (EC) No 1272/2008:**
The product is classified and labeled according to the CLP regulation.

· **Hazard Pictograms:**

GHS05

· **Signal Word:** DANGER

· **Hazard Statements:**
H314 Causes severe skin burns and eye damage.

· **Precautionary Statements:**

P260	Do not breathe mist.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309	If exposed or if you feel unwell:
P310	Immediately call a doctor.

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 08/11/2016 Version 4 Date Reviewed: 08/11/2016

Product Identifier: Liquid Caustic Soda 20-25%

(Contd. from Page 8)

P501 Dispose of contents/container in accordance with local regulations.

Section 16: Other Information

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Skyhawk Chemicals, Inc. at the time it was prepared. Skyhawk Chemicals, Inc. does not assume any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, Skyhawk Chemicals, Inc. and its subsidiaries cannot guarantee that these are the only hazards that exist. Skyhawk Chemicals, Inc. assumes no legal responsibility for loss, damage or expense arising out of, or in any way connected with, the handling, storage, use or disposal of this product.

· **Department Issuing Safety Data Sheet:** Corporate Environment, Health & Safety

· **Sources & References:**
This Safety Data Sheet conforms to regulation 1907/2006/EC (REACH). This product has been classified in accordance with European CLP regulations (1272/2008/EC) and the U.S. Hazard Communication standard (29 CFR 1910.1200).

* - Indicates that data has been updated from the previous version.

Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

· **Product Identifier: Sodium Hypochlorite Solution (10-20%)**

· **Synonyms:** Bleach

· **Product Use:** Various industrial uses.

·**Supplier:**
Skyhawk Chemicals Inc.
701 N Post Oak Rd.,Ste 540
Houston, TX 79024 USA
+1 (713) 975-2200
E-Mail: order@skyhawkchemicals.com

· **Emergency Telephone Number:**
In case of a chemical emergency, contact CHEMTREC (24 hrs) at:
+1 (800) 424-9300 (United States, Canada, Puerto Rico, Virgin Islands)
Acct# 721839

* Section 2: Hazards Identification

· **Hazard Classification:**


GHS09

Aquatic Acute 2 H401 Toxic to aquatic life.


GHS05

Skin Corr. 1A H314 Causes severe skin burns and eye damage.

Eye Dam. 1 H318 Causes serious eye damage.

· **Signal Word:** DANGER

· **Precautionary Statements:**

P260	Do not breathe dusts or mists.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309	If exposed or if you feel unwell:
P310	Immediately call a doctor.
P501	Dispose of contents/container in accordance with local regulations.

· **NFPA Ratings (scale 0 - 4):**

Health = 3
Fire = 0
Reactivity = 2

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Product Identifier: Sodium Hypochlorite Solution (10-20%)

(Contd. from Page 1)

· **Additional Information:**
If you do not understand the hazards or safety precautions described in this data sheet, contact your supervisor or safety administrator before handling this product.

Section 3: Composition/Information on Ingredients

· **Dangerous Components:**
· **CAS No. Description**

7681-52-9 sodium hypochlorite, solution 10-20%
Skin Corr. 1B, H314; Aquatic Acute 1, H400

1310-73-2 sodium hydroxide ≤5%
Skin Corr. 1A, H314

Section 4: First Aid Measures

· **General information:**
Rescue personnel must wear appropriate protective equipment during removal of victims from contaminated areas.

· **After Inhalation:**
Remove victim to fresh air.
Administer oxygen if breathing is difficult.
Administer artifical respiration if breathing has stopped.
Onset of symptoms may be delayed up to 48 hours.
Get immediate medical attention.

· **After Skin Contact:**
Remove contaminated clothing and shoes. Wash affected area with soap and water.
Use caution to avoid spreading contamination while washing.
Delayed skin damage is possible if product is not completely washed off.
Get immediate medical attention.

· **After Eye Contact:**
In case of accidental contact, immediately flush eyes with water.
Hold eyelids open to ensure adequate flushing.
Remove contact lenses, if present and easy to do. Continue rinsing.
Get immediate medical attention.

· **After Swallowing:**
Rinse mouth.
Administer 1-2 glasses of water to dilute ingested material.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.
Get immediate medical attention.

· **Most Important Symptoms and Effects:** No further relevant information available.

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Product Identifier: Sodium Hypochlorite Solution (10-20%)

(Contd. from Page 2)

Section 5: Firefighting Measures

· **Suitable Extinguishing Agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray.

· **Special Firefighting Hazards:**
Decomposes when heated. Decomposition products may cause containers to rupture or explode. May react vigorously with organic materials. Depending on temperature and concentration, decomposition products may include hypochlorous acid, sodium oxide, chlorine gas, sodium chlorate and oxygen. Sodium chlorate crystals may cause fire or explosion if subjected to friction or impact.

· **Protective Equipment:**
In the event of a fire, wear a NIOSH (USA) or CEN (EU) approved self-contained breathing apparatus (SCBA) and full protective clothing.

· **Additional Information:** Evacuate all non-essential personnel from the danger area.

Section 6: Accidental Release Measures

· **Personal Precautions, Protective Equipment and Emergency Procedures:**
In case of a spill or other accidental release of this material, contact your supervisor, safety administrator, or emergency response team immediately.
Restrict access to keep out unauthorized or unprotected personnel.
Stay upwind of spilled material.
Wear appropriate personal protective equipment during all clean-up activities. See Section 8 for more information.
Avoid inhalation and direct contact.
All clean-up personnel must be properly trained.

· **Environmental Precautions:**
Keep spilled material out of sewage/drainage systems and waterways.
This product contains a U.S. EPA Reportable Quantity (RQ) substance. If amounts exceeding the Reportable Quantity are released, notification of the National Response Center +1 (800) 424-8802 is required. See Section 15 for more information.

· **Methods for Containment and Clean-Up:**
Ensure adequate ventilation.
Secure the source of the leak if conditions are safe.
Use neutralizing agent.
Collect using an appropriate absorbent material such as clay or sand.
Place waste in an appropriate container for disposal.
Use care during clean-up to avoid exposure to the material and injury from broken containers.

Section 7: Handling and Storage

· **Precautions for Safe Handling:**
Ensure adequate ventilation.
Avoid inhalation and direct contact.
Wear appropriate personal protective equipment.
Do not mix with water without dilution and agitation to prevent potentially violent reaction.
Do not mix with acids, ammonia, alcohol, ethers or hydrocarbons.

· **Protection Against Fires and Explosions:** No special measures required.

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Product Identifier: Sodium Hypochlorite Solution (10-20%)

(Contd. from Page 3)

· **Conditions for Safe Storage:**
Store in closed, properly labeled containers.
Protect containers from heat, physical damage, ignition sources and incompatible materials.
Have emergency equipment for fires and spills readily available.

· **Additional Information:**
If you do not understand the hazards or safety precautions described in this data sheet, contact your supervisor or safety administrator before handling this product.

Section 8: Exposure Controls/Personal Protection

· **Occupational Exposure Limits:**

7681-52-9 sodium hypochlorite, solution
WEEL (USA) Short-Term Value: 2 mg/m³

1310-73-2 sodium hydroxide
PEL (USA) Eight-Hour Value: 2 mg/m³
REL (USA) Ceiling Limit Value: 2 mg/m³
TLV (USA) Ceiling Limit Value: 2 mg/m³

· **Exposure Controls:**
Use local exhaust ventilation during open transfers.
Check ventilation for proper operation before starting work.
Ensure emergency eyewash and shower facilities are available.

· **General Protective and Hygienic Measures:**
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Follow all safety precautions, posted signs and warnings.
Do not inhale gases / fumes / aerosols.
Avoid contact with the eyes and skin.

· **Respiratory Protection:**
An industrial hygiene risk assessment is required to determine appropriate respiratory protection.
An air-purifying respirator may be appropriate under limited exposure conditions.
Perform a respirator fit/seal check after donning.
Protection provided by air-purifying respirators is limited.
Wear a self-contained breathing apparatus (SCBA) if there is a potential for uncontrolled release, exposure levels are not known, or in other circumstances where air-purifying respirators may not provide adequate protection.

· **Hand Protection:**

Chemical resistant gloves.

Work gloves may be worn over chemical resistant gloves.
Wear a second pair of chemical resistant gloves for added protection.
Tape gloves to coveralls or suit, if worn.
Use caution when removing gloves to avoid exposure to hazardous chemicals.

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Product Identifier: Sodium Hypochlorite Solution (10-20%)

(Contd. from Page 4)

· **Eye/Face Protection:**

Safety glasses with side shields.

Splash goggles/mono-goggles recommended during tasks with high potential for exposure.

· **Body Protection:**
Lab coat recommended for small scale operations.
Tasks with a high probability for splashing or skin contact may require:
Chemical resistant coveralls or apron.
Heavy duty chemical resistant boots.

· **Additional Information:**
If unusual exposures are expected, an industrial hygiene review of work practices, engineering controls and personal protective equipment is recommended.

Section 9: Physical/Chemical Properties

· **Form:**	Liquid
· **Color:**	Light yellow
· **Odor:**	Pungent
· **Odor Threshold:**	Not determined.
· **pH Value at 20 °C (68 °F):**	12.5
· **Melting Point:**	Not determined.
· **Boiling Point:**	Not determined.
· **Flash Point:**	Not applicable.
· **Autoignition Temperature:**	Not determined.
· **Decomposition Temperature:**	Not determined.
· **Lower Explosive Limit (LEL):**	Not determined.
· **Upper Explosive Limit (UEL):**	Not determined.
· **Vapor Pressure at 20 °C (68 °F):**	20 hPa (15 mm Hg)
· **Density:**	Not determined.
· **Vapor Density at 20 °C (68 °F):**	2.6 g/cm³ (21.697 lbs/gal) (air = 1)
· **Evaporation Rate:**	Not determined.
· **Solubility in Water:**	Not determined.
· **Partition Coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	Not determined.

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Safety Data Sheet
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Product Identifier: Sodium Hypochlorite Solution (10-20%)

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Section 10: Stability and Reactivity

· **Chemical Stability/Reactivity:** Stable if used and stored according to the specifications listed below.

· **Conditions to Avoid:**
Keep away from heat, sparks and open flames.
Keep away from incompatible materials.
Do not mix with water without dilution and agitation to prevent potentially violent reaction.
Do not mix with acids, ammonia, alcohol, ethers or hydrocarbons.

· **Possibility of Hazardous Reactions/Incompatible Materials:**
Keep away from strong acids and bases.
Keep away from strong oxidizers.
Contact with acids releases toxic gases.

· **Hazardous Decomposition Products:**
Decomposes when heated. Decomposition products may cause containers to rupture or explode. May react vigorously with organic materials. Depending on temperature and concentration, decomposition products may include hypochlorous acid, sodium oxide, chlorine gas, sodium chlorate and oxygen. Sodium chlorate crystals may cause fire or explosion if subjected to friction or impact.

* Section 11: Toxicological Information

· **Acute Toxicity:** No data available.

· **Relevant LD/LC50 Values:**

7681-52-9 sodium hypochlorite, solution
Oral LD50 5800 mg/kg (mouse)

1310-73-2 sodium hydroxide
Oral LD50 2000 mg/kg (rat)

· **Skin Irritation:**
Causes severe skin burns and eye damage.

· **Eye Irritation:**
Causes severe skin burns and eye damage.
Causes serious eye damage.

· **Respiratory Irritation:** May cause respiratory irritation.

· **Sensitization/Allergic Reaction:** No data available.

· **Subchronic/Chronic Toxicity:** No data available.

* Section 12: Ecological Information

· **Aquatic Toxicity:** Toxic to aquatic life.

· **Persistence and Degradability:** No data available.

· **Bioaccumulative Potential:** No data available.

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Product Identifier: Sodium Hypochlorite Solution (10-20%)

(Contd. from Page 6)

Section 13: Disposal Considerations

· **Disposal Instructions:**
Keep spilled material out of sewage/drainage systems and waterways.
Maximize product recovery for reuse or recycling.
Waste materials may be hazardous due to the pH/corrosivity.
Dispose of waste in accordance with applicable laws and regulations.

· **Additional Information:**
It is the responsiblity of the product user to determine at the time of disposal whether a material containing or derived from this product should be classified as hazardous waste.

*
Section 14: Transport Information

· **UN Number:**

· **DOT, ADR, IMDG, IATA** UN1791

· **UN Proper Shipping Name:**

· **DOT:** RQ Hypochlorite solutions

· **ADR:** 1791 Hypochlorite solutions

· **IMDG:** HYPOCHLORITE SOLUTION, MARINE POLLUTANT

· **IATA:** HYPOCHLORITE SOLUTION

· **Transport Hazard Class(es):**

· **DOT:**

· **Class:** 8 Corrosive substances

· **Label:** 8

· **ADR, IMDG**

· **Class:** 8 Corrosive substances

· **Label:** 8

· **IATA:**

· **Class:** 8 Corrosive substances

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Product Identifier: Sodium Hypochlorite Solution (10-20%)

(Contd. from Page 7)

· **Label:** 8

· **Packing Group:**

· **DOT, ADR, IMDG, IATA** III

· **Environmental Hazards:**

· **Marine Pollutant:** Yes
Symbol (fish and tree)

· **Special Marking (ADR):** Symbol (fish and tree)

· **Special Precautions:** Warning: Corrosive substances

· **EMS Number:** F-A,S-B

· **Segregation Groups:** Hypochlorites

· **Additional Information:**

· **DOT:**

· **Remarks:** This product contains a U.S. EPA Reportable Quantity (RQ) substance. If amounts exceeding the Reportable Quantity are released, notification of the National Response Center +1 (800) 424-8802 is required. See Section 15 for more information.
.
Shippers must consult transportation regulations for packaging instructions, quantity limitations and other regulatory information applicable to the desired mode of transport.

* Section 15: Regulatory Information

· **U.S. Superfund Amendments & Reauthorization Act (SARA) 355 (Extremely Hazardous Substances):**
None of the ingredients are listed.

· **U.S. Superfund Amendments & Reauthorization Act (SARA) 313 (Specific Toxic Chemical Listings):**
None of the ingredients is listed.

· **U.S. Environmental Protection Agency Reportable Quantity:**
7681-52-9 sodium hypochlorite, solution: 100 lbs.

1310-73-2 sodium hydroxide: 1,000 lbs.

· **U.S. Toxic Substances Control Act (TSCA):**
All ingredients are listed.

· **California Proposition 65 Carcinogens:**
None of the ingredients is listed.

· **Canadian Domestic Substances List (DSL):**
All ingredients are listed.

· **Canadian Ingredient Disclosure List (limit 0.1%)**
None of the ingredients are listed.

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Product Identifier: Sodium Hypochlorite Solution (10-20%)

(Contd. from Page 8)

· **Canadian Ingredient Disclosure List (limit 1%):**
All ingredients are listed.

· **Container Labeling According to Regulation (EC) No 1272/2008:**
The product is classified and labeled according to the CLP regulation.

· **Hazard Pictograms:**


GHS09


GHS05

· **Signal Word:** DANGER

· **Hazard Statements:**
H401 Toxic to aquatic life.
H314 Causes severe skin burns and eye damage.

· **Precautionary Statements:**

P260	Do not breathe dusts or mists.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309	If exposed or if you feel unwell:
P310	Immediately call a doctor.
P501	Dispose of contents/container in accordance with local regulations.

Section 16: Other Information

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Skyhawk Chemicals, Inc. at the time it was prepared.
Skyhawk does not assume any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, Skyhawk cannot guarantee that these are the only hazards that exist
Skyhawk assumes no legal responsibility for loss, damage or expense arising out of, or in any way connected with, the handling, storage, use or disposal of this product,

· **Abbreviations & Acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Date Printed: 04/05/2017 Version 3 Date Reviewed: 04/04/2017

Product Identifier: Sodium Hypochlorite Solution (10-20%)

(Contd. from Page 9)

IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labeling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
Skin Corr. 1A: Skin corrosion/irritation – Category 1A
Skin Corr. 1B: Skin corrosion/irritation – Category 1B
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1

· **Sources & References:**

* - Indicates that data has been updated from the previous version.
This Safety Data Sheet conforms to regulation 1907/2006/EC (REACH). This product has been classified in accordance with European CLP regulations (1272/2008/EC) and the U.S. Hazard Communication standard (29 CFR 1910.1200).

SAFETY DATA SHEET

according to 29 CFR 1910.1200(g)

Sulfuric Acid 93-98 Percent

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

Product Name:	Sulfuric Acid 93-98 Percent
Product Code:	SA93/98
Formula:	H2SO4
Synonyms:	Oil of Vitriol
Intended Use of the Product:	Inorganic Acid. For industrial use only.
Supplier:	Skyhawk Chemicals, Inc 701 N Post Oak Rd Ste 500 Houston, TX 77024 Phone:713-957-2200 / 800-535-2847 Fax: 713-957-0345 order@skyhawkchemicals.com
Emergency number:	CHEMTREC 800-424-9300 ACCT#: CCN721839

SECTION 2: HAZARDS IDENTIFICATION

Classification (GHS-US):	Skin Corr. 1A H314 Eye Dam. 1 H318 Carc. 1A H350
Label Elements: GHS-US Labeling Hazard Pictograms (GHS-US)	 GHS05 GHS08
Signal Word (GHS-US)	Danger.
Hazard Statements (GHS-US)	H314 - Causes severe skin burns and eye damage. H318 - Causes serious eye damage. H350 - May cause cancer (Inhalation).
Precautionary Statements (GHS-US)	P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P260 - Do not breathe fume, mist, vapors, spray. P264 - Wash hands and forearms thoroughly after handling. P280 - Wear eye protection, face protection, protective gloves, protective clothing. P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308+P313 - If exposed or concerned: Get medical advice/attention. P310 - Immediately call a POISON CENTER or doctor. P321 - Specific treatment (see Section 4). P363 - Wash contaminated clothing before reuse.

SECTION 2: HAZARDS IDENTIFICATION (CONTINUED)

Precautionary Statements (GHS-US)	P405 - Store locked up. P501 - Dispose of contents/container according to local, regional, national, territorial, provincial, and international regulations.
Other Hazards:	Not available
Unknown Acute Toxicity (GHS-US):	Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product identifier	% (w/w)	Classification (GHS-US)
Sulfuric acid	(CAS No) 7664-93-9	93-98	Skin Corr. 1A, H314 Eye Dam. 1, H318 Carc. 1A, H350
Water	(CAS No) 7732-18-5	7-2	Not classified

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

Inhalation:	Using proper respiratory protection, immediately move the exposed person to fresh air. Keep at rest and in a position comfortable for breathing. Give oxygen or artificial respiration if necessary. Seek immediate medical advice.
Skin Contact:	Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.
Eye Contact:	Immediately rinse with water for a prolonged period (at least 15 minutes) while holding the eyelids wide open. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
Ingestion:	If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label. Rinse mouth.

Most Important Symptoms and Effects Both Acute and Delayed

General: Corrosive. Causes burns.

Inhalation:	Causes severe respiratory irritation if inhaled. Symptoms may include: burning of nose and throat, constriction of airway, difficulty breathing, shortness of breath, bronchial spasms, chest pain, and pink frothy sputum. May cause pulmonary edema. Symptoms may be delayed.
Skin Contact:	Contact may cause immediate severe irritation progressing quickly to chemical burns. Highly corrosive to skin.
Eye Contact:	Contact may cause immediate severe irritation progressing quickly to chemical burns. Can cause blindness.
Ingestion:	May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract. Swallowing a small quantity of this material will result in serious health hazard.
Chronic Symptoms:	Prolonged and frequent exposure through inhalation may cause cancer.

SECTION 4: FIRST AID MEASURES (CONTINUED)

Indication of Any Immediate Medical Attention and Special Treatment Needed
If medical advice is needed, have product container or label at hand.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media: Do not get water inside containers. Do not apply water stream directly at source of leak. A direct water stream will cause violent splattering and generation of heat.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable but reacts exothermically with incompatibles, releasing heat and increasing risk of fire or explosion.
Explosion Hazard: Risk of fire and explosion on contact with combustible substances or reducing agents.
Reactivity: Reacts exothermically with (some) bases. Violent exothermic reaction with water: release of corrosive gases/vapors.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.
Firefighting Instructions: Do not get water inside containers. Do not apply water stream directly at source of leak.
Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.
Hazardous Combustion Products: Sulphur oxides.
Other information: Do not allow run-off from fire fighting to enter drains or water courses.

Reference to Other Sections:

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not get in eyes, on skin, or on clothing. Do not breathe vapor or mist.

For Non-Emergency Personnel

Protective Equipment: Use recommended respiratory protection. Wear suitable protective clothing, gloves and eye/face protection.
Emergency Procedures: Stop leak if safe to do so. Eliminate ignition sources. Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: Use recommended respiratory protection. Wear suitable protective clothing, gloves and eye/face protection.
Emergency Procedures: Stop leak if safe to do so. Eliminate ignition sources. Ventilate area.

Environmental Precautions

Do not allow to enter drains or water courses. Avoid release to the environment.

Methods and Material for Containment and Cleaning Up

For Containment: Liquid spill: neutralize with powdered limestone or sodium bicarbonate.
Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Do not absorb with combustible material such as: saw dust or cellulosic material.

SECTION 6: ACCIDENTAL RELEASE MEASURES (CONTINUED)

Methods for Cleaning Up: Ventilate area. Collect absorbed material and place into a sealed, labelled container for proper disposal.

Reference to Other Sections

See section 8, Exposure Controls and Personal Protection

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Ensure all national/local regulations are observed.
Storage Conditions: Store in original container or corrosive resistant and/or lined container. May be stored in stainless steel containers. Store in an area having corrosion resistant concrete floor. Store in a dry, cool and well-ventilated place. Store away from other materials. **Incompatible Materials:** Reducing agents, organic materials, alkalis, moisture.

Specific End Use(s)

Inorganic Acid. For industrial use only.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Sulfuric acid (7664-93-9)

Mexico	OEL TWA (mg/m³)	1 mg/m³
USA ACGIH	ACGIH TWA (mg/m³)	0.2 mg/m³
USA OSHA	OSHA PEL (TWA) (mg/m³)	1 mg/m³
USA NIOSH	NIOSH REL (TWA) (mg/m³)	1 mg/m³
USA IDLH	US IDLH (mg/m³)	15 mg/m³
Alberta	OEL STEL (mg/m³)	3 mg/m³
Alberta	OEL TWA (mg/m³)	1 mg/m³
British Columbia	OEL TWA (mg/m³)	0.2 mg/m³ (Thoracic, contained in strong inorganic acid mists)
Manitoba	OEL TWA (mg/m³)	0.2 mg/m³
New Brunswick	OEL STEL (mg/m³)	3 mg/m³
New Brunswick	OEL TWA (mg/m³)	1 mg/m³
Newfoundland & Labrador	OEL TWA (mg/m³)	0.2 mg/m³
Nova Scotia	OEL TWA (mg/m³)	0.2 mg/m³
Nunavut	OEL STEL (mg/m³)	3 mg/m³
Nunavut	OEL TWA (mg/m³)	1 mg/m³
Northwest Territories	OEL STEL (mg/m³)	3 mg/m³

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

Sulfuric acid (7664-93-9)

Northwest Territories	OEL TWA (mg/m³)	1 mg/m³
Ontario	OEL TWA (mg/m³)	0.2 mg/m³
Prince Edward Island	OEL TWA (mg/m³)	0.2 mg/m³
Québec	VECD (mg/m³)	3 mg/m³
Québec	VEMP (mg/m³)	1 mg/m³
Saskatchewan	OEL STEL (mg/m³)	0.6 mg/m³
Saskatchewan	OEL TWA (mg/m³)	0.2 mg/m³
Yukon	OEL STEL (mg/m³)	1 mg/m³
Yukon	OEL TWA (mg/m³)	1 mg/m³

Exposure Controls

Appropriate Engineering Controls: Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

Personal Protective Equipment:

Materials for Protective Clothing: Acid-resistant clothing.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: A full face shield is recommended. Chemical goggles or safety glasses. **Skin and Body Protection:** Chemical resistant suit. Rubber apron, boots.

Respiratory Protection: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

Thermal Hazard Protection: If material is hot, wear thermally resistant protective gloves.

SECTION 9: PHYSICAL & CHEMICAL PROPERTIES

Information on Basic Physical & Chemical Properties

Physical State:	Liquid
Appearance:	Clear
Odor:	Pungent, irritating
Odor Threshold:	Not available
pH:	< 1
Relative Evaporation Rate (butylacetate=1):	Not available

SECTION 9: PHYSICAL & CHEMICAL PROPERTIES (CONTINUED)

Melting Point:	1 °C (30 °F)
Freezing Point:	- 1 °C (30 °F)
Boiling Point:	327 °C (621 °F)
Flash Point:	Not available
Auto-ignition Temperature:	Not available
Decomposition Temperature:	Not available
Flammability (solid, gas):	Not available
Lower Flammable Limit:	Not available
Upper Flammable Limit:	Not available
Vapor Pressure:	0.002 mm Hg at 40 °C (104 °F)
Relative Vapor Density at 20 °C:	3.4 (air = 1)
Relative Density:	1.84 at 15.55 °C (60 °F) (water = 1)
Density:	15.35 l□□□al at 15.55□C □□0□F)
Solubility:	Miscible
Log Pow:	Not available
Log Kow:	Not available
Viscosity, Kinematic:	Not available
Viscosity, Dynamic:	26.7 cP at 20 °C (68 °F)
Explosion Data – Sensitivity to Mechanical Impact:	Not available
Explosion Data – Sensitivity to Static Discharge:	Not available

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	Reacts exothermically with (some) bases. Violent exothermic reaction with water (moisture): release of corrosive gases/vapours.
Chemical Stability:	Stable at standard temperature and pressure.
Possibility of Hazardous Reactions:	Hazardous polymerization will not occur.
Conditions to Avoid:	Protect from moisture. Water. Keep away from (strong) bases. Contact with metallic substances.

SECTION 10: STABILITY AND REACTIVITY (CONTINUED)

Incompatible Materials:	Reducing agents, water, combustible materials, bases, organic materials, metals.
Hazardous Decomposition Products:	Under conditions of fire this material may produce sulphur oxides.

SECTION 11: TOXICOLOGICAL INFORMATION	Information on Toxicological Effects - Product
Acute Toxicity:	Not classified
LD50 and LC50 Data:	See below and Section 12
Skin Corrosion/Irritation:	Causes severe skin burns and eye damage (pH: < 1)
Serious Eye Damage/Irritation:	Causes serious eye damage (pH: < 1)
Respiratory or Skin Sensitization:	Not classified
Germ Cell Mutagenicity:	Not classified
Teratogenicity:	Not available
Carcinogenicity:	May cause cancer (Inhalation)
Specific Target Organ Toxicity (Repeated Exposure):	Not classified
Reproductive Toxicity:	Not classified
Specific Target Organ Toxicity (Single Exposure):	Not classified
Aspiration Hazard:	Not classified
Symptoms/Injuries After Inhalation:	Causes severe respiratory irritation if inhaled. Symptoms may include: Burning of nose and throat, constriction of airway, difficulty breathing, shortness of breath, bronchial spasms, chest pain, and pink frothy sputum. May cause pulmonary edema. Symptoms may be delayed.
Symptoms/Injuries After Skin Contact:	Contact may cause immediate severe irritation progressing quickly to chemical burns. Highly corrosive to skin.
Symptoms/Injuries After Eye Contact:	Contact may cause immediate severe irritation progressing quickly to chemical burns. Can cause blindness.
Symptoms/Injuries After Ingestion:	May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract. Swallowing a small quantity of this material will result in serious health hazard.
Chronic Symptoms:	Prolonged and frequent exposure through inhalation may cause cancer.

Information on Toxicological Effects - Ingredient(s) - LD50 and LC50 Data	
Sulfuric acid (7664-93-9)	
LD50 Oral Rat	2140 mg/kg
LC50 Inhalation Rat (mg/l)	510 mg/m³ (Exposure time: 2 h)
ATE (oral)	2140 mg/kg body weight
ATE (dust, mist)	510 mg/l/4h
Sulfuric acid (7664-93-9)	
IARC Group	1 (inorganic acid mist)

SECTION 12: ECOLOGICAL INFORMATION

Toxicity	
Sulfuric acid (7664-93-9)	
LC50 Fish 1	500 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [static])
EC50 Daphnia 1	29 mg/l (Exposure time: 24 h - Species: Daphnia magna)

Persistence and Degradability	
Sulfuric Acid 98 Percent	
Persistence and Degradability	Product is biodegradable.

Bioaccumulative Potential	
Sulfuric Acid 98 Percent	
Bioaccumulative Potential	Not expected to bioaccumulate.
Sulfuric acid (7664-93-9)	
BCF fish 1	(no bioaccumulation)

Mobility in Soil:	Not available
Other Adverse Effects	Not available

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/DOT/TDG

DOT UN No.:	UN 1830
DOT Proper Shipping Name:	Sulfuric acid
Department of Transportation (DOT) Hazard Classes:	Class 8 - Corrosive
DOT Symbols:	None
Packing group (DOT)	II

SECTION 14: TRANSPORT INFORMATION (CONTINUED)

In Accordance With ICAO/IATA/DOT/TDG

DOT Special Provisions	See 49 C.F.R. 172.102
DOT Reportable Quantity (RQ)	1,000 lb
USCG CHRIS Code	SFA

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

Sulfuric Acid 93 Percent

SARA Section 311/312 Hazard Classes Immediate (acute) health hazard Delayed (chronic) health hazard

Sulfuric acid (7664-93-9)

United States TSCA (Toxic Substances Control Act) inventory	Yes.
EPCRA (SARA) § 313 Toxic Release Inventory (TRI)	Yes □Aerosol forms only.
EPCRA (SARA) § 302 Extremely Hazardous Substance (EHS)	Yes
EPCRA (SARA) § 302 Threshold Planning Quantity (TPQ)	1,000 lb.
EPCRA (SARA) § 302 EHS Reportable Quantity (RQ)	1,000 lb.
CERCLA Reportable Quantity (RQ)	1,000 lb.
CERCLA Hazardous Substance	Yes.

Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Sulfuric acid (7664-93-9)

U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute

U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic

U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)

U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)

U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)

U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities

U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations

U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)

U.S. - Idaho - Occupational Exposure Limits - TWAs

U.S. - Illinois - Toxic Air Contaminant Carcinogens

U.S. - Illinois - Toxic Air Contaminants

U.S. - Louisiana - Reportable Quantity List for Pollutants

SECTION 15: REGULATORY INFORMATION (CONTINUED)

US State Regulations

Sulfuric acid (7664-93-9)

U.S. - Maine - Air Pollutants - Hazardous Air Pollutants
U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1 U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2 U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1 U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2 U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Occupational Exposure Limits - TWAs
U.S. - Michigan - Polluting Materials List
U.S. - Minnesota - Chemicals of High Concern
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New Jersey - Special Health Hazards Substances
List U.S. - New York - Occupational Exposure Limits - TWAs
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances U.S. - North Carolina - Control of Toxic Air Pollutants
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - Ohio - Extremely Hazardous Substances - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual
U.S. - South Carolina - Toxic Air Pollutants - Maximum Allowable Concentrations

SECTION 15: REGULATORY INFORMATION (CONTINUED)

US State Regulations

Sulfuric acid (7664-93-9)

U.S. - South Carolina - Toxic Air Pollutants - Pollutant Categories

U.S. - Tennessee - Occupational Exposure Limits - TWAs

U.S. - Texas - Effects Screening Levels - Long Term

U.S. - Texas - Effects Screening Levels - Short Term

U.S. - Vermont - Permissible Exposure Limits - TWAs

U.S. - Washington - Permissible Exposure Limits - STELs

U.S. - Washington - Permissible Exposure Limits - TWAs

U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet

U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet

U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater

U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet

Canadian Regulations

Sulfuric acid 93-98 Percent (7664-93-9)

WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class E - Corrosive Material

Sulfuric acid (7664-93-9)

Listed on the Canadian DSL (Domestic Substances List) inventory. Listed on the Canadian Ingredient Disclosure List	
WHMIS Classification Class D	Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects Class E - Corrosive Material

Water (7732-18-5)

Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

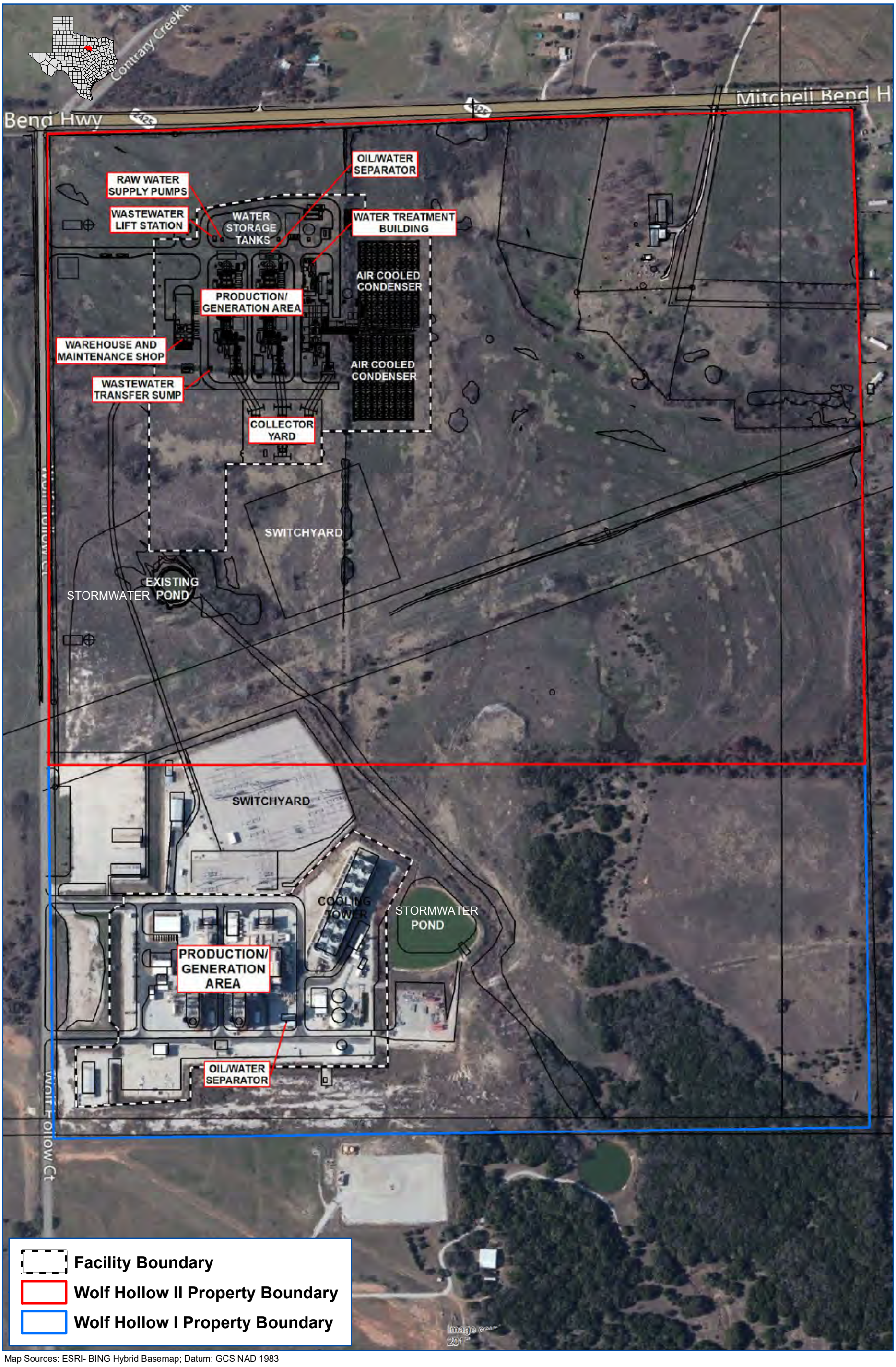
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION

Indication of Changes:	11/20/2013
Other Information:	This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200
GHS Full Text Phrases:	
Carc. 1A	Carcinogenicity Category 1A
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Corr. 1A	Skin corrosion/irritation Category 1A
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H350	May cause cancer

The information contained in this Material Safety Data Sheet (MSDS) relates only to the specific product(s) designated herein. The information and recommendations are based upon data believed to be current as of the date of this MSDS and was obtained from sources believed to be accurate. However, this information is furnished without warranty, representations, or license of any kind, express or implied, with respect to accuracy, correctness, or completeness and neither Skyhawk Chemicals, Inc. nor its marketing affliates assume any legal responsibility for use or reliance upon same.

North America GHS US 2012 & WHMIS



Map Sources: ESRI- BING Hybrid Basemap; Datum: GCS NAD 1983

0 150 300 Meters

0 500 1,000 Feet

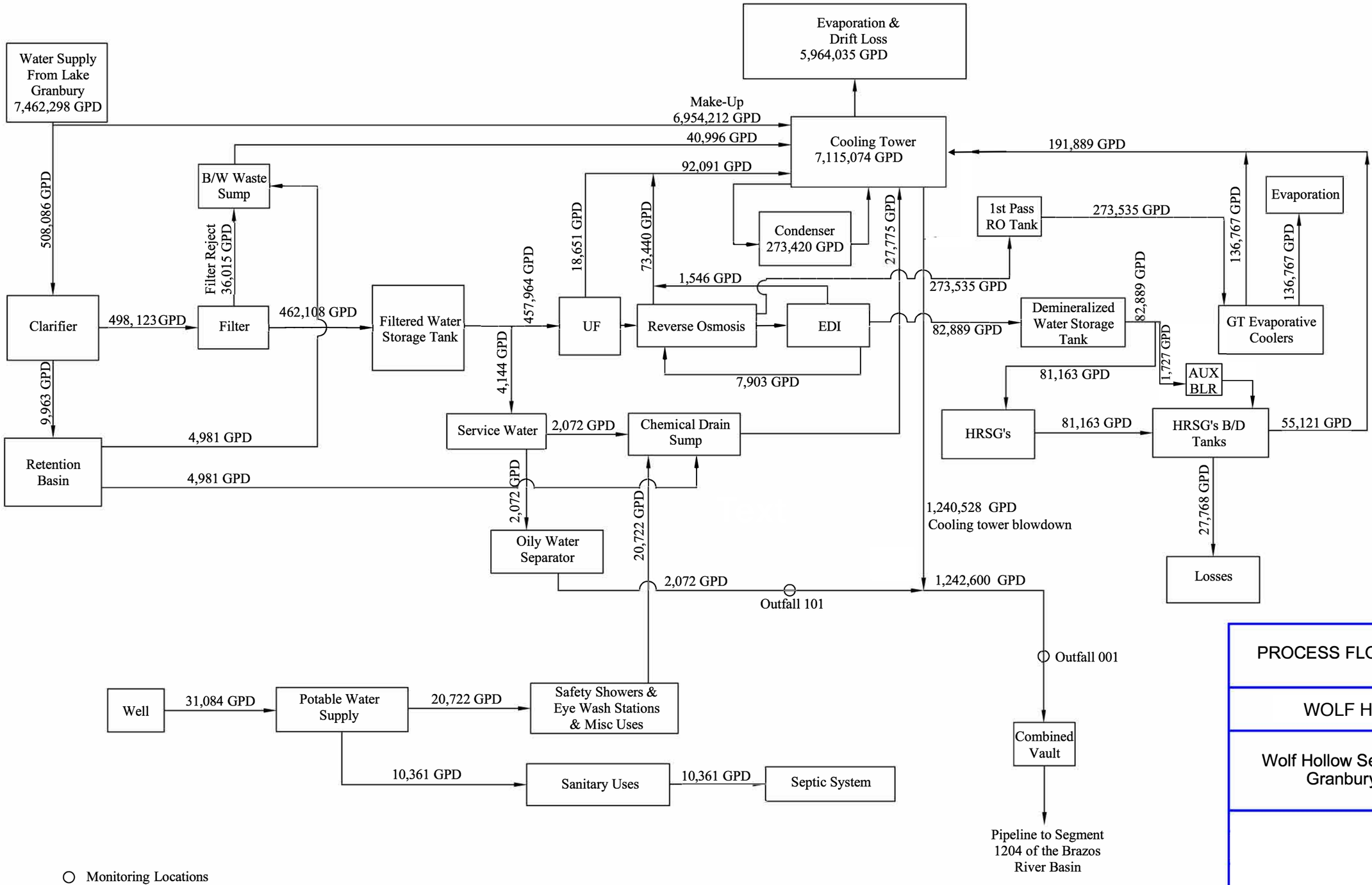
POWER ENGINEERS

FACILITY MAP

Wolf Hollow I and II
Hood County, Texas

H:\Exelon\154064 WH I II TPDES Renewal

Drafted by:	Reviewed By:	Project No.:	Date:
R. von Czoernig	D. Sorrells	154064	10/25/18



PROCESS FLOW DIAGRAM

WOLF HOLLOW I

Wolf Hollow Services, L.L.C.
Granbury, Texas

Table 1. Wastewater Flows by Outfall

Outfall	Wastewater Sources	Monthly Average (MGD)	Flow % by Wastewater Source	Applicable Effluent Guideline (EGL)[1]
001	Cooling tower blowdown	1.241	99.8%	40 CFR 423.15(a)(1),(10)(i)
	Boiler blowdown [2]	N/A	N/A	N/A
	Low volume wastes (via Outfall 101)	0.002	0.2%	40 CFR 423.15(a)(3)
	Outfall 001 Total	1.243	100%	
101	Low volume wastes [3]	0.002	100%	40 CFR 423.15(a)(3)

Notes

[1] 40 CFR 423 - Steam Electric Generating

[2] Blowdown from the heat recovery steam generators (HRSGs) is directed to the cooling water system as makeup water.

[3] Includes turbine cooler blowdown, boiler blowdown, reverse osmosis reject, service water reject, oil/water separator wastewater. HRSG blowdown and water treatment wastewaters are directed to the cooling water system as makeup water.

N/A Not applicable