

Environmental Impact Statement Agency Meeting Scoping Report

Dow Chemical Company Harris Reservoir Expansion Project

Department of the Army Permit Application
SWG-2016-01027



**US Army Corps
of Engineers** ®



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1. Introduction

The National Environmental Policy Act of 1969 (NEPA) requires an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. Scoping is an opportunity for the U.S. Army Corps of Engineers (Corps) to introduce and explain the interdisciplinary approach to our environmental analysis as well as solicit public and agency comments regarding environmental resources, potential impacts, and alternatives that should be included.

This Scoping Report has been developed for the Corps to share the types of comments/concerns that were received from the cooperating and participating agencies during the agency scoping meeting on May 12, 2020 as well as agency comment letters received during the scoping period. Agency comments were used to develop alternatives to be carried forward for analysis in the EIS and identified issues that are important to the agencies to be considered in the analysis of the EIS. A summary of the public scoping process and comments are noted in a separate report.

1.1. Project Background

The Corps received a permit application for a U.S. Department of the Army (DA) permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act from Dow Chemical Company (Dow) for the proposed Project. The goal of the project is to utilize Dow's existing run-of-river water rights from the Brazos River to improve reliability for the existing Brazoria and Harris reservoir system during extended drought conditions.

The project includes the construction of an off-channel impoundment reservoir with a nominal storage capacity of 50,000-acre-feet that would be located directly upstream and adjacent to the existing Harris Reservoir. The proposed reservoir would cover approximately 2,000 acres and would include a pumped intake station on the Brazos River and a gravity outfall to Oyster Creek through the construction of a new bypass channel.

The proposed reservoir would operate with the existing Harris and Brazoria reservoirs in a manner similar to current operations. During periods of drought, the proposed reservoir would be exhausted first, followed by the existing Harris Reservoir, and then the Brazoria Reservoir. As with current operations, emergency releases would occur due to severe weather, such as tropical storms and hurricanes exhibiting wind speeds that could potentially overtop the embankments.

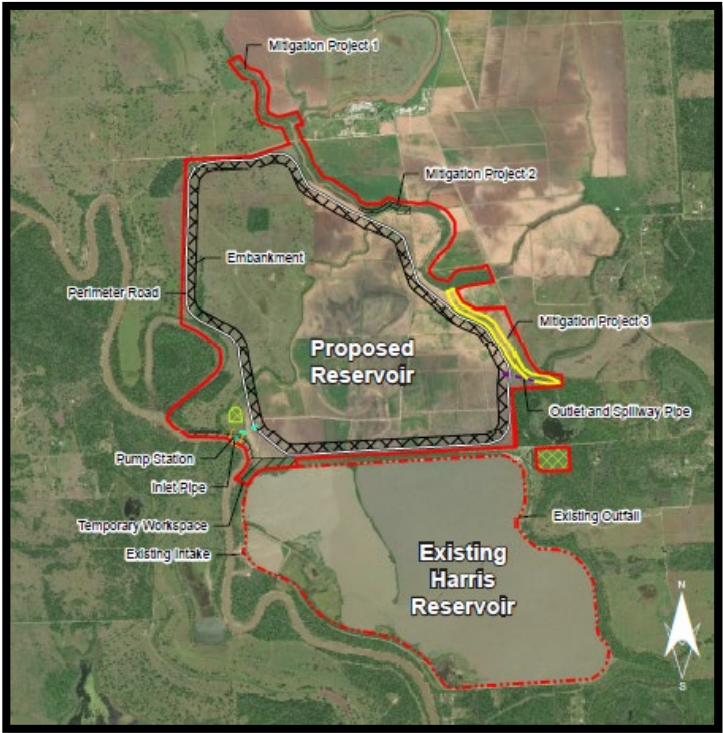


Figure 1 - Proposed Project Area.

The proposed Project includes plans for the mitigating of impacts via restoration projects, all on Oyster Creek. These three projects (referred to as Mitigation Projects 1, 2, and 3) to enhance the

flood capacity and to provide restoration and enhancements of the plant habitats and communities along the river bank (riparian area). The proposed stream restoration includes creating flat or shallowly sloped areas above the bankfull height to slow high velocity flows during storm events (bankfull benching), 100-foot buffer preservation, and buffer re-establishment up to 200 feet.

- Mitigation Project 1 is located on a 3,600-linear-foot unnamed tributary to Oyster Creek.
- Mitigation Project 2 is located on a 12,860-linear-foot segment of Oyster Creek.
- Mitigation Project 3, located on an 11,200-linear-foot segment of Oyster Creek, would serve as a receiving channel conveying overflows from Oyster Creek during high flows by providing additional hydraulic conveyance capacity in the floodplain, and would provide additional flood storage capacity by receiving backwater from Oyster Creek at the downstream end of Project 3 during flood events.



Figure 2 – Example Proposed Project improvements

1.2. Purpose and Need for Proposed Project

The Corps is required to restate the purpose and need for the project from the public interest perspective. The Corps, after coordinating with the cooperating agencies, developed the following overall purpose to identify and screen alternatives to the applicant's proposed Project:

To utilize Dow's existing run-of-river water rights from the Brazos River to improve reliability during extended drought conditions for the existing water supply system that serves Dow's Texas Operations in Freeport as well as other industrial, community and potable water users that rely on Dow's water supply. Based on modeling, Dow estimates that a total of 78,000 acre-feet of water storage capacity is necessary to provide Texas Commission on Environmental Quality's recommended 180 days of drought resilience. The current combined storage capacity in the existing Brazoria and Harris reservoirs is approximately 29,000 acre-feet. Therefore, Dow will need to develop the Harris Reservoir Expansion Reservoir to provide an additional storage capacity of at least 49,000 to provide a reliable water supply during drought.

2. Scoping Process

2.1. Transition to Virtual Meetings

Although agency scoping meetings are not always held in person, due to emergency health procedures, the agency scoping was required to be held virtually. On March 24, 2020, the Corps issued a memorandum: *Interim Army Procedures for National Environmental Policy Act (NEPA)* in response to the coronavirus (COVID-19) pandemic. The memorandum established interim Army NEPA procedures in consideration of the COVID-19 public health emergency. These interim NEPA procedures apply to all Army NEPA proponents responsible for NEPA compliance. The memorandum directed the following actions related to public meetings and the NEPA process:

- NEPA public meetings will be transitioned to virtual meetings, postponed, or cancelled, as deemed appropriate by the Army NEPA proponent.
- Alternative means of public engagement will be implemented and documented in public participation plans. Virtual meetings may be conducted using online meeting / collaboration tools, teleconference, social media, or email, as appropriate.
- NEPA public and Federal Register notices will inform the public about these alternative participation procedures and how to obtain NEPA materials on the project web site or through the mail. Public notices will provide a contact phone number, email, website address, and mailing address.
- Project information, including, but not limited to, scoping materials, draft NEPA documents, and comment forms will be available on project websites. This includes materials normally presented at public meetings.
- Project information, including, but not limited to, scoping materials, draft NEPA documents, and comment forms will be sent through the mail as either hard copies or as printable compact discs (as requested). Mailed materials will include requested materials normally presented at public meetings and materials on the project website.
- Army NEPA proponents will ensure cooperating agencies are aware of these NEPA alternative participation procedures.

In response to this memorandum, the Corps determined that the agency scoping meeting for the proposed Project would be moved to a virtual platform in accordance with the above interim procedures.

2.2. Agency Notification of Scoping

A meeting invitation was emailed to agencies on April 28, 2020 (**Appendix A**). Representatives from the following agencies were invited:

- Environmental Protection Agency (EPA)
- U.S. Fish & Wildlife Service (USFWS)
- Texas Commission on Environmental Quality (TCEQ)
- Texas Parks and Wildlife (TPWD)
- Texas Historical Commission (THC)
- Texas General Land Office (TXGLO)

The agencies were also provided maps and figures for the proposed project (**Appendix B**).

3. Agency Scoping Meeting Summary

A virtual public scoping meeting, hosted by the Corps, Galveston District, for the proposed Project EIS was held online via Cisco WebEx Events on May 12, 2020.

The purpose of this virtual agency scoping meeting was to provide the agencies with information about the proposed Project and to solicit comments and information to better enable the Corps to make a reasonable decision on factors affecting the public interest.

A total of 25 people attended the agency scoping meeting including the Corps and other agencies, Dow, and contractors. An attendee list is included in **Table 1**.

Table 1. Meeting Attendees

Agency/Company	Last Name	First Name	Title
Corps	Col. Vail	Timothy	Lead Agency
Corps	Hudson	Jayson	Lead Agency
Corps	Heinly	Bob	Lead Agency
Corps	Lumen	Mark	Lead Agency
EPA	Kasper	Paul	Cooperating Agency
EPA	Hayden	Keith	Cooperating Agency
USFWS	Bearb	Amber	Cooperating Agency
TCEQ	Lueg	Jenna	Agency
TPWD	Roco	Coleen	Agency
THC	Durst	Jeff	Agency
Dow	Sampson	Yvonne	Applicant
Dow	Cone	Gabriella	Applicant
Dow	Bond	Greg	Applicant
Dow	Rehman	Rana	Applicant
Dow	Finley	Tim	Applicant
Dow	Lord	Glenn	Applicant
Dow	Nipper	Will	Applicant
SWCA	Fiore	Whitney	Contractor
SWCA	Hartmann	Christine	Contractor
SWCA	Giblin	Kara	Contractor
Watearth	Lundberg	Jennifer	Contractor
Watearth	Walker	Jennifer	Contractor
Hollaway	Sankey	Amanda	Contractor
Hollaway	Stokes	Connor	Contractor
Hollaway	Aina	Emmanuella	Contractor

The meeting began with opening remarks from Col. Timothy Vail of the Corps Galveston District. Col. Vail read a summary of the proposed action and discussed the scoping process. Following this introduction, the meeting proceeded with a presentation of the proposed Project led by Mr. Greg Bong, a representative from Dow. This was followed by a presentation about the EIS scoping process, the purpose and need of the proposed Project, and known environmental concerns led by Mr. Jayson Hudson, a representative of the Corps. Presentation materials are located in **Appendix C**. Once presentations were completed, attendees were provided an opportunity to provide comments on the proposed project.

3.1. Verbal Comments Received

Following the formal presentation portion of the meeting, each agency was invited to provide verbal comments. A summary of verbal comments received from each agency during the meeting are provided in **Table 2**.

Table 2. Verbal Comments Received

Commenter (Last Name/First Name)		Agency	Comment
Hayden	Keith	EPA	No comments from a NEPA prospective but confirming July 2 is deadline for scoping comments.
Kaspar	Paul	EPA	Inquired about restoration and mitigation for Oyster Creek. Requested to clearly identify which activities have joint intent and purpose.
Bearb	Amber	USFWS	No comments at this time. Will review closely and provide written comments.
Lueg	Jenna	TCEQ	No comment. Asked if there would be wetland impacts. USACE confirmed yes there are wetlands within the footprint.
Roco	Coleen	TPWD	Comments were submitted in April 30, 2018 letter and included concerns with environmental impacts to Brazos Rivers and Oyster Creek from change in hydrology, concerns about aquatic organisms, concern with salinity change downstream in Oyster Creek. Will review wetland delineation and stream assessment and submit scoping comments in writing
		THC	No response.
		Texas GLO	No response.

3.2. Written Comments Received

EPA, USFWS, TCEQ, TPWD, and THC also provided written comments by the July 2nd, 2020, scoping deadline (see letters in **Appendix D**). The scoping letters contained 21 comments, as summarized below. NOAA National Marine Fisheries Service stated they will not provide comments since they do not have trust resources in the area.

- Reducing potential short-term *air quality* impacts during construction (1)
- Evaluating impacts to *waters of the U.S.* including wetland and stream functions and values (4)
- Concerns with impacts to *vegetation and wildlife habitats* including habitat loss, restoration, and spread of non-native species (3)
- Concerns with *sedimentation and water quality* due to removal of riparian habitat (3)
- Requests to provide plans for *mitigation* of impacts to streams and wetlands (5)
- General comments about the *public involvement* process (2)
- Concern with *environmental justice* including recommendations to consult with tribal governments (2)
- Request for the applicant to conduct baseline surveys for *threatened and endangered species* (1)

4. Alternatives

The Corps evaluated information obtained from scoping and with federal and state agencies, the public as well as data collection and analysis of environmental, socioeconomic, and engineering factors as part of development of alternatives to the proposed Project. The Corps prioritized minimization of impacts, both individually and cumulatively, to aquatic resources during both construction and operations in its development of alternatives. Using these concepts and considering avoidance and minimization to reduce impacts, the following seven Project alternatives were identified.

1. **No Action Alternative:** Under the No Action Alternative, no additional water storage would be constructed and that the proposed activity would not take place and Dow would continue to operate their water supply system as is currently done. The No Action alternative would include Dow's current water conservation and water reclamation projects.
2. **The Harris Reservoir Expansion Project Alternative:** This alternative includes construction of an off-channel reservoir located on approximately 2,000 acres directly north of the existing Harris Reservoir to add approximately 50,000 acre-feet of additional storage capacity and estimated annual yield of approximately 80,000 acre-feet. This location is in the floodplain for the Brazos River and Oyster Creek and adjacent to Dow's existing infrastructure.
3. **The Harris Expansion Project – Alternate Embankment Configuration:** This alternative includes alternate site layout for the construction of an off-channel reservoir located on approximately 2,000 acres directly north of the existing Harris Reservoir to add approximately 50,000 acre-feet of additional storage capacity and estimated annual yield of approximately 80,000 acre-feet. Alternative site layouts, or on-site alternatives, may reduce impacts to the Brazos River and Oyster Creek.
4. **The Off-Channel Reservoir–West Bank Brazos River Alternate Location:** This alternative will be located on the west bank of the Brazos River. This alternative would include consideration of an area outside the Oyster Creek Floodplain to construct a 50,000 AF reservoir and would allow Dow to use their existing Brazos River water rights but is not adjacent to Dow's existing infrastructure.
5. **The Allens Creek Reservoir Alternative:** This alternative is a proposed water supply storage reservoir planned for construction near the City of Wallis in Austin County. The off-channel reservoir is near the Brazos River on Allens Creek, a tributary of the Brazos, composed of diversions from the mainstem of the Brazos River which would be pumped to the impoundment formed by a dam on Allens Creek. The reservoir will have a storage capacity of up to 145,533 acre-feet and an approximate annual yield of 99,650 acre-feet. The maximum permitted diversion rate is 2,200 cubic feet per second (cfs) or approximately 1,400 MGD. The water right for Allens Creek Reservoir are owned by the Brazos River Authority and the City of Houston.
6. **The Seawater Desalination Alternative:** This alternative would include diversion of seawater using an intake facility, a reverse osmosis plant, an outfall to discharge brine concentrate, as well as water conveyance facilities.
7. **The Brackish Water Desalination Alternative:** This alternative would include diversion of brackish water from the Brazos River using an intake facility, a reverse osmosis plant, an outfall to discharge brine concentrate, as well as water conveyance facilities.

The Corps conducted a multi-step process to screen the range of alternatives to determine which alternatives are reasonable, practicable, and meet the Project purpose. The Project alternatives were analyzed using the following screening criteria to identify a range of reasonable alternatives: satisfaction of the overall Project purpose; practicable based on Clean Water Act Section 404(b)(1) Guidelines (technology, logistics, cost); and consideration of potential aquatic resources impacts. The alternatives screening analysis is summarized in **Table 3**.

Table 3. Comparison Summary of Alternatives

Alternative	Carried Forward (Yes/No)			
	Purpose and Need	Practicability - Technology	Practicability - Logistics	Practicability - Cost*
<i>No Action</i>	No	Yes	Yes	Yes
<i>Harris Reservoir Expansion</i>	Yes	Yes	Yes	Yes
<i>Harris Expansion Alternate Embankment Configuration</i>	Yes	Yes	Yes	Yes
<i>Harris Expansion Project –West Bank Brazos River Location Alternate</i>	Yes	Yes	Yes	Yes
<i>Allen’s Creek Reservoir</i>	No	Yes	No	Yes
<i>Seawater Desalination</i>	No	Yes	Yes	No
<i>Brackish Water Desalination</i>	Yes	Yes	Yes	Yes
<i>*It is not a particular applicant's financial standing that is the primary consideration for determining practicability in regards to cost, but rather characteristics of the project and what constitutes a reasonable expense for these projects that are most relevant to practicability determinations.</i>				

Based on this analysis, the Corps determined that the No Action Alternative and four action alternatives will be carried forward for detailed analysis in the EIS. Both the Seawater Desalination alternative and Allens Creek Reservoir alternatives were eliminated because they do not allow Dow to use their existing run-of-river water rights from the Brazos River. In addition, the Allens Creek Reservoir site is owned by the Brazos River Authority and the City of Houston and is not reasonably available to Dow.

Appendix A

Meeting Invitation

From: [Hudson, Jayson M CIV USARMY CESWG \(USA\)](#)
To: [Ardizzone, Charles](#); Houston.robert@epa.gov; [Samson, Yvonne \(Y\)](#); [Roco, Coleen](#); [Allison Buchtien](#); [Kaspar, Paul](#); Jenna.Lueg@tceq.texas.gov; [401CERTS](#); Bill.Martin@thc.state.tx.us; [Amy Nunez](#)
Cc: [Whitney Fiore](#); [Christine Hartmann](#); [Kara Giblin](#); [McMahan, Joseph A CIV USARMY CESWG \(USA\)](#); [HEINLY, Robert W CIV USARMY CESWG \(USA\)](#); [Hudson, Jayson M CIV USARMY CESWG \(USA\)](#)
Subject: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting
Date: Tuesday, April 28, 2020 4:39:08 PM

EXTERNAL: This email originated from outside SWCA. Please use caution when replying.

The U.S. Army Corps of Engineers will be hosting a Virtual Agency Scoping Meeting for the Dow Chemical Company's Harris Reservoir Expansion EIS on May 12th from 9-11:30am. The purpose of the public scoping process is to identify relevant issues that will influence the scope of the environmental analysis and EIS alternatives.

The meeting will be hosted online at:
<https://usace.webex.com/meet/jayson.m.hudson>

You may use the website audio or call in on a telephone at:
Phone: 877-336-1839
Access: 426 9357#
Code: 1027#

If you call in from a telephone, please make sure to include your participant ID provided by the website when logging in. The participant ID will assist in facilitating the meeting. The meeting will be recorded for transcription into the administrative record.

For additional information on the project, including the initial public notice and the significance determination, please visit: <https://www.swg.usace.army.mil/Business-With-Us/Regulatory/Special-Projects-Environmental-Impact-Statements/>

Please respond to this email to confirm your agency's attendance.

Jayson M Hudson
Regulatory Project Manager
Policy Analysis Branch
Galveston District
409.766.3108

Please tell me how I am doing by completing the survey found at:
http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

Appendix B

Maps and Figures

Kara Giblin

From: Whitney Fiore
Sent: Wednesday, May 6, 2020 3:06 PM
To: Hudson, Jayson M CIV USARMY CESWG (USA); Ardizzone, Charles; Houston.robert@epa.gov; Samson, Yvonne (Y); Roco, Coleen; Allison Buchtien; Kaspar, Paul; Jenna.Lueg@tceq.texas.gov; 401CERTS; Bill.Martin@thc.state.tx.us; Amy Nunez; Hoth, David
Cc: Christine Hartmann; Kara Giblin; McMahan, Joseph A CIV USARMY CESWG (USA); HEINLY, Robert W CIV USARMY CESWG (USA)
Subject: RE: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting - Maps File 1 of 2

Follow Up Flag: Follow up
Flag Status: Completed

Good afternoon, SWCA is supporting USACE in preparing the EIS for the above-referenced project. We have attached a zip file with maps and figures intended to facilitate project understanding for next Tuesday's meeting.

Because some of you may have limited capacity related to file sizes, we are sending the maps and figures in two 5 MB zip files so another email will be sent shortly.

Thank you. I look forward to speaking with you all next week.

Whitney Fiore
Dow Reservoir EIS Project Manager

Whitney Fiore
C 310.387.7755

-----Original Message-----

From: Hudson, Jayson M CIV USARMY CESWG (USA) <Jayson.M.Hudson@usace.army.mil>
Sent: Tuesday, May 5, 2020 11:14 AM
To: Ardizzone, Charles <chuck_ardizzone@fws.gov>; Houston.robert@epa.gov; Samson, Yvonne (Y) <ysamson@dow.com>; Roco, Coleen <Colleen.Roco@tpwd.texas.gov>; Allison Buchtien <Allison.Buchtien@GLO.TEXAS.GOV>; Kaspar, Paul <kaspar.paul@epa.gov>; Jenna.Lueg@tceq.texas.gov; 401CERTS <401CERTS@tceq.texas.gov>; Bill.Martin@thc.state.tx.us; Amy Nunez <Amy.Nunez@GLO.TEXAS.GOV>; Hoth, David <david_hoth@fws.gov>
Cc: Whitney Fiore <wfiore@swca.com>; Christine Hartmann <Christine.Hartmann@swca.com>; Kara Giblin <KGiblin@swca.com>; McMahan, Joseph A CIV USARMY CESWG (USA) <Joseph.A.Mcmahan@usace.army.mil>; HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>
Subject: RE: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting

EXTERNAL: This email originated from outside SWCA. Please use caution when replying.

Correction, Tuesday May 12th.

Jayson M Hudson
Regulatory Project Manager
409.766.3108

Please tell me how I am doing by completing the survey found at:
http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

-----Original Message-----

From: Hudson, Jayson M CIV USARMY CESWG (USA)

Sent: Tuesday, May 5, 2020 10:12 AM

To: Ardizzone, Charles <chuck_ardizzone@fws.gov>; Houston.robert@epa.gov; Samson, Yvonne (Y) <YSamson@dow.com>; Roco, Coleen <Colleen.Roco@tpwd.texas.gov>; Allison Buchtien <Allison.Buchtien@GLO.TEXAS.GOV>; Kaspar Paul <Kaspar.Paul@epa.gov>; Jenna.Lueg@tceq.texas.gov; 401CERTS <401CERTS@tceq.texas.gov>; Bill.Martin@thc.state.tx.us; Amy Nunez <Amy.Nunez@GLO.TEXAS.GOV>; Hoth, David <david_hoth@fws.gov>

Cc: Whitney Fiore <wfiore@swca.com>; Christine Hartmann <Christine.Hartmann@swca.com>; Kara Giblin <KGiblin@swca.com>; McMahan, Joseph A CIV USARMY CESWG (USA) <Joseph.A.Mcmahan@usace.army.mil>; HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>

Subject: RE: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting

Hello,

I just wanted to send a reminder that the Corps will be hosting the Agency Scoping Meeting for the Dow Harris Reservoir Expansion EIS on Monday May 12th. If you plan to attend but have not RSVP'd, please let me know.

Thank you,

Jayson M Hudson
Regulatory Project Manager
409.766.3108

Please tell me how I am doing by completing the survey found at:
http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

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Sent: Tuesday, April 28, 2020 3:39 PM

To: Ardizzone, Charles <chuck_ardizzone@fws.gov>; Houston.robert@epa.gov; Samson, Yvonne (Y) <YSamson@dow.com>; Roco, Coleen <Colleen.Roco@tpwd.texas.gov>; Allison Buchtien <Allison.Buchtien@GLO.TEXAS.GOV>; Kaspar Paul <Kaspar.Paul@epa.gov>; Jenna.Lueg@tceq.texas.gov; 401CERTS <401CERTS@tceq.texas.gov>; Bill.Martin@thc.state.tx.us; Amy Nunez <Amy.Nunez@GLO.TEXAS.GOV>

Cc: Whitney Fiore <wfiore@swca.com>; Christine Hartmann <Christine.Hartmann@swca.com>; Kara Giblin <KGiblin@swca.com>; McMahan, Joseph A CIV USARMY CESWG (USA) <Joseph.A.Mcmahan@usace.army.mil>; HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>; Hudson, Jayson M CIV USARMY CESWG (USA) <Jayson.M.Hudson@usace.army.mil>

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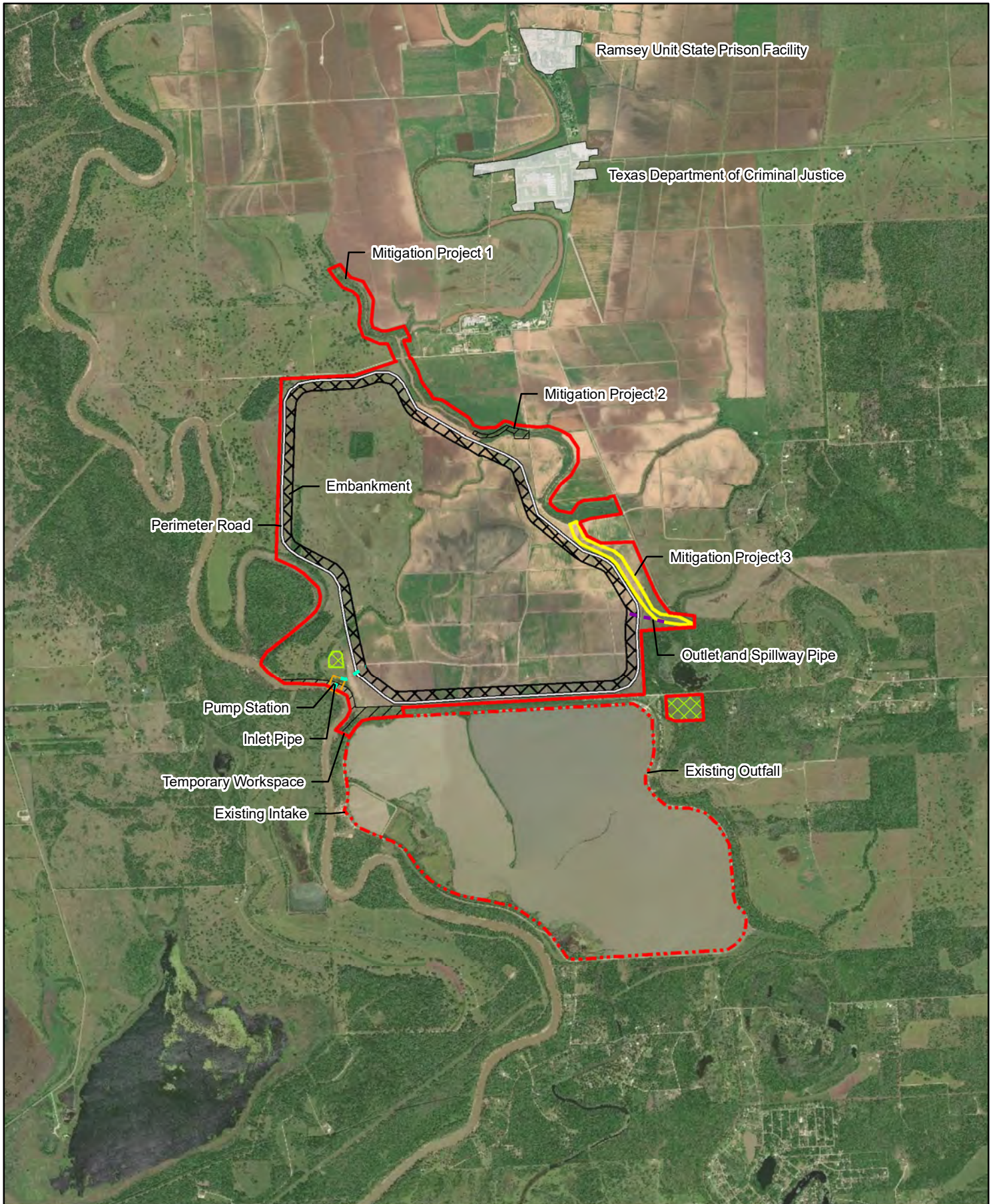
Jayson M Hudson
Regulatory Project Manager
Policy Analysis Branch
Galveston District
409.766.3108

Please tell me how I am doing by completing the survey found at:
http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0



	<p>DOW CHEMICAL HARRIS RESEVOIR EXPANSION PROJECT ARCHAEOLOGICAL HISTORIC PROPERTIES MAP BRAZORIA COUNTY, TEXAS</p>	<ul style="list-style-type: none"> Project Boundary Cemetery ▲ Archaeological Site 		<p>1:30,000</p> <p>Created By: K. Shultz Project Number: 52872 Date: 1/9/2020 NAD 1983 StatePlane Texas South Central FIPS 4204 Feet</p>
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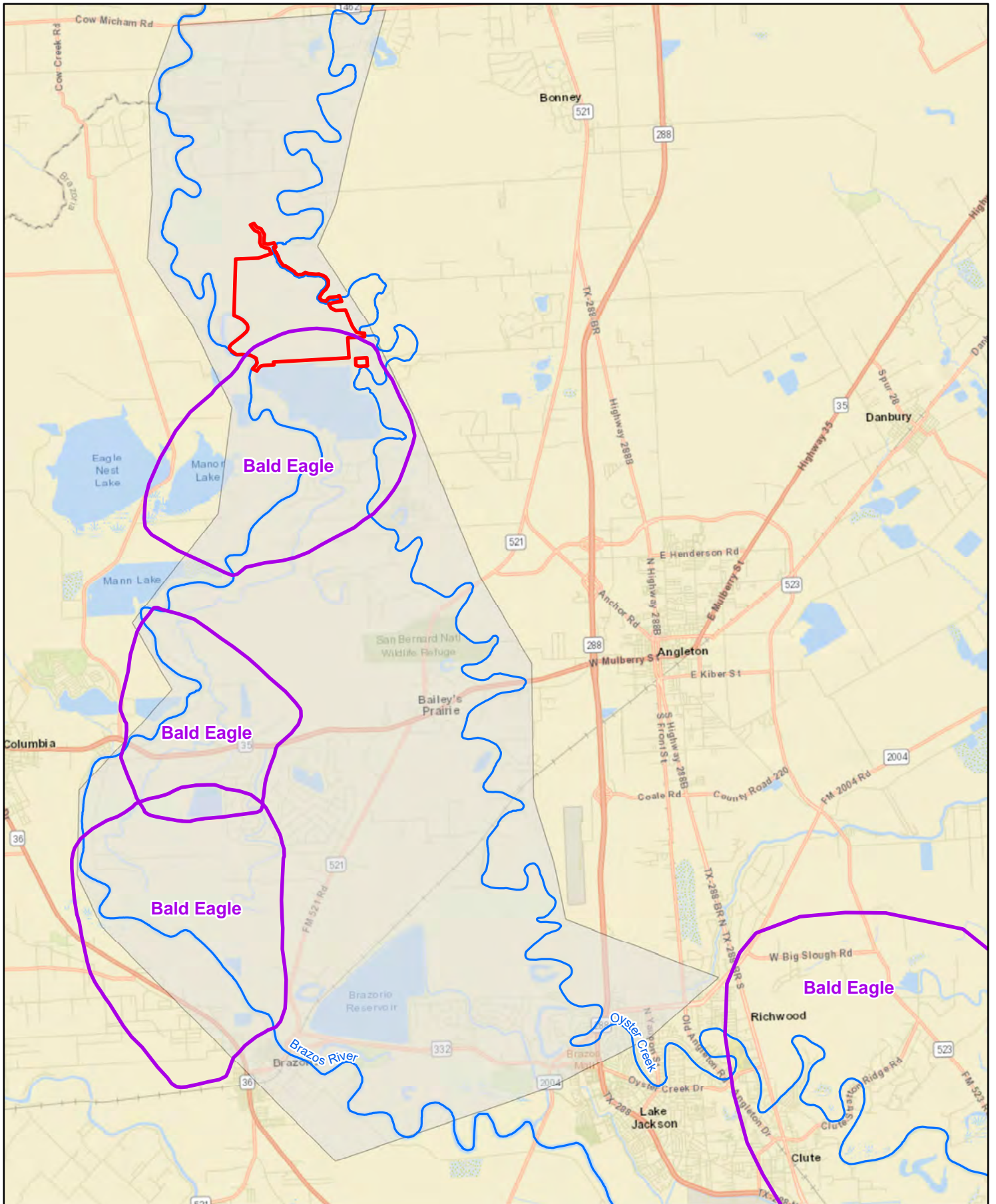
FIGURE X



	DOW CHEMICAL HARRIS RESEVOIR EXPANSION PROJECT VISUAL ANALYSIS MAP BRAZORIA COUNTY, TEXAS	Project Site	Embankment	Staging Area
		Existing Harris Reservoir	Outfall	Temporary Workspace
		Intake Pipe	Perimeter Road	Correctional Facility
		Spillway Pipe	Pump Station	

1:50,000
 Created By: CM
 Project Number: 52872
 Date: 06/02/20
 NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

FIGURE 2



SWCA
ENVIRONMENTAL CONSULTANTS

DOW CHEMICAL HARRIS RESEVOIR EXPANSION PROJECT

BALD EAGLE (STATE-LISTED SPECIES) MAP
BRAZORIA COUNTY, TEXAS

Project Site

TXND

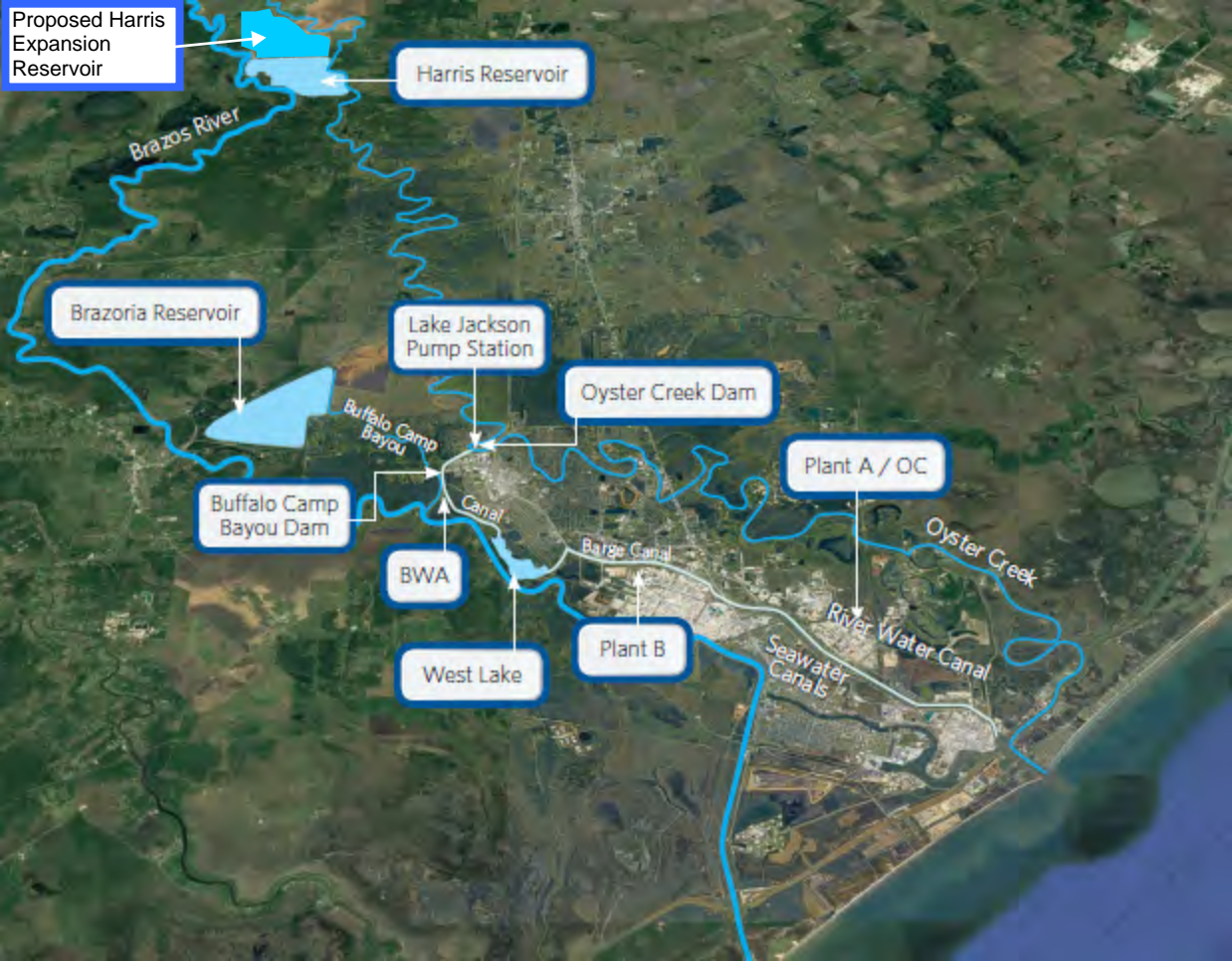
Affected Environment Boundary

River

1:160,000

Created By: K. Shields
Project Number: 52872
Date: 04/2020
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

0 0.5 1 1.5 2 2.5 Miles
0 1 2 3 4 Kilometers



Proposed Harris Expansion Reservoir

Harris Reservoir

Brazoria Reservoir

Lake Jackson Pump Station

Oyster Creek Dam

Buffalo Camp Bayou Dam

Plant A / OC

BWA

West Lake

Plant B

Seawater Canals

Brazos River

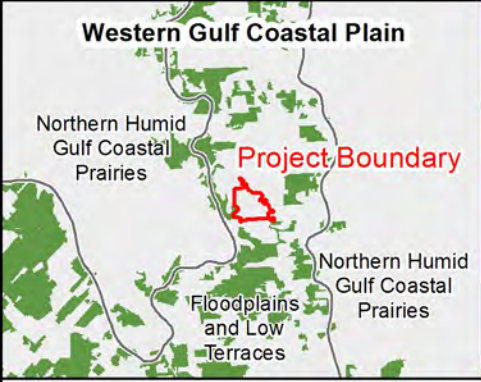
Buffalo Camp Bayou

Canal

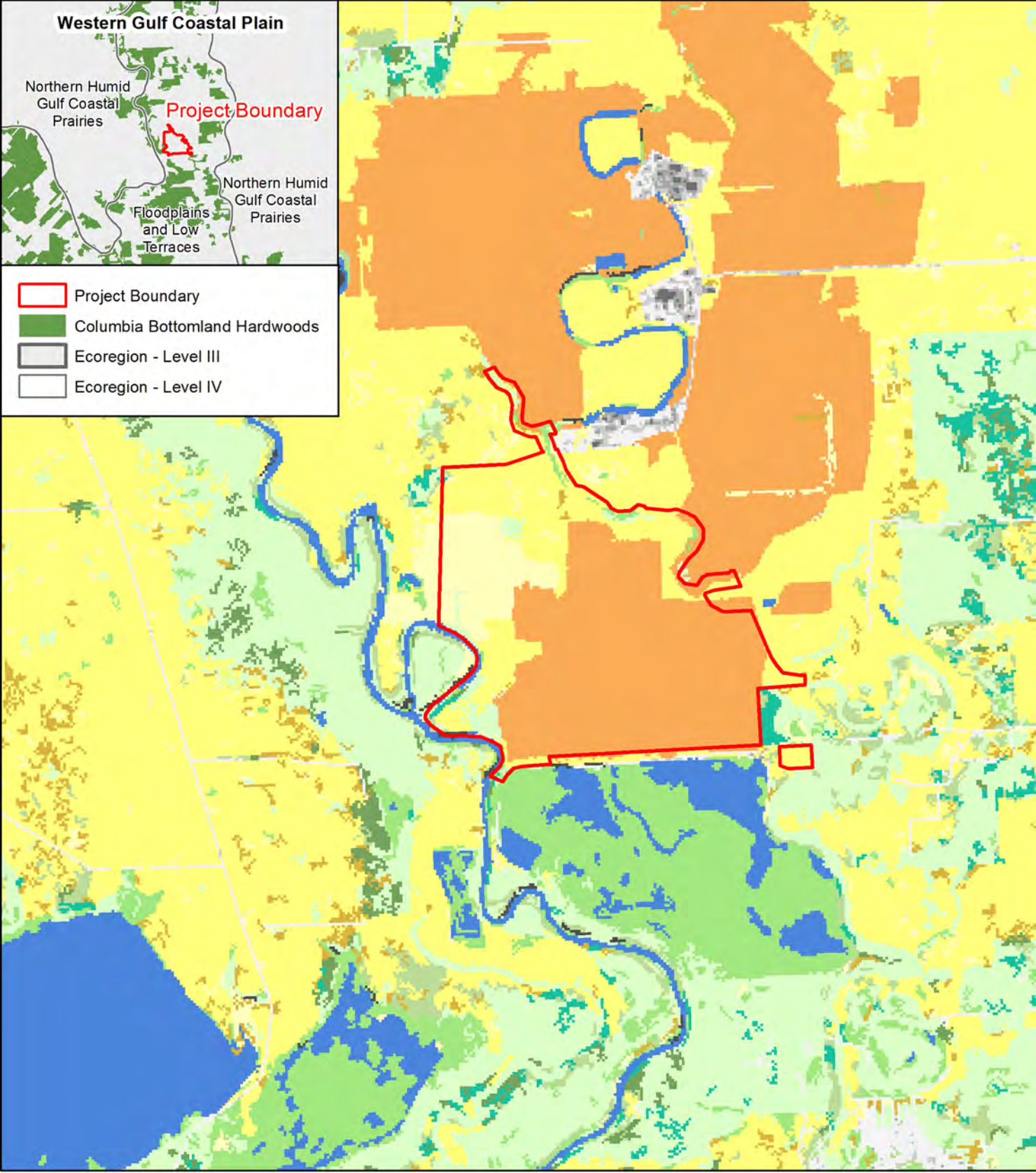
Barge Canal

Oyster Creek

River Water Canal



- Project Boundary
- Columbia Bottomland Hardwoods
- Ecoregion - Level III
- Ecoregion - Level IV



**DOW CHEMICAL HARRIS
RESEVOIR EXPANSION PROJECT**

LAND COVER MAP
BRAZORIA COUNTY, TEXAS

FIGURE 3-1

- | | | |
|----------------------------|------------------------------|-----------------------------|
| Project Boundary | High Intensity Developed | Pasture/Hay |
| Land Cover | Barren Land (Rock/Sand/Clay) | Cultivated Crops |
| Open Water | Deciduous Forest | Woody Wetland |
| Open Space Developed | Evergreen Forest | Emergent Herbaceous Wetland |
| Low Intensity Developed | Mixed Forest | |
| Medium Intensity Developed | Shrub/Scrub | |
| | Grassland | |

1:60,000

Created By: K. Shields
Project Number: 52872
Date: 12/13/2019
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

Kara Giblin

From: Whitney Fiore
Sent: Wednesday, May 6, 2020 3:08 PM
To: Hudson, Jayson M CIV USARMY CESWG (USA); Ardizzone, Charles; Houston.robert@epa.gov; Samson, Yvonne (Y); Roco, Coleen; Allison Buchtien; Kaspar, Paul; Jenna.Lueg@tceq.texas.gov; 401CERTS; Bill.Martin@thc.state.tx.us; Amy Nunez; Hoth, David
Cc: Christine Hartmann; Kara Giblin; McMahan, Joseph A CIV USARMY CESWG (USA); HEINLY, Robert W CIV USARMY CESWG (USA)
Subject: RE: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting - Maps File 2 of 2

Follow Up Flag: Follow up
Flag Status: Completed

All, Here is the second zip file containing maps and figures.

Whitney

Whitney Fiore
C 310.387.7755

-----Original Message-----

From: Whitney Fiore
Sent: Wednesday, May 6, 2020 3:06 PM
To: Hudson, Jayson M CIV USARMY CESWG (USA) <Jayson.M.Hudson@usace.army.mil>; Ardizzone, Charles <chuck_ardizzone@fws.gov>; Houston.robert@epa.gov; Samson, Yvonne (Y) <ysamson@dow.com>; Roco, Coleen <Colleen.Roco@tpwd.texas.gov>; Allison Buchtien <Allison.Buchtien@GLO.TEXAS.GOV>; Kaspar, Paul <kaspar.paul@epa.gov>; Jenna.Lueg@tceq.texas.gov; 401CERTS <401CERTS@tceq.texas.gov>; Bill.Martin@thc.state.tx.us; Amy Nunez <Amy.Nunez@GLO.TEXAS.GOV>; Hoth, David <david_hoth@fws.gov>
Cc: Christine Hartmann <Christine.Hartmann@swca.com>; Kara Giblin <KGiblin@swca.com>; McMahan, Joseph A CIV USARMY CESWG (USA) <Joseph.A.Mcmahan@usace.army.mil>; HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>
Subject: RE: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting - Maps File 1 of 2

Good afternoon, SWCA is supporting USACE in preparing the EIS for the above-referenced project. We have attached a zip file with maps and figures intended to facilitate project understanding for next Tuesday's meeting.

Because some of you may have limited capacity related to file sizes, we are sending the maps and figures in two 5 MB zip files so another email will be sent shortly.

Thank you. I look forward to speaking with you all next week.

Whitney Fiore
Dow Reservoir EIS Project Manager

Whitney Fiore
C 310.387.7755

-----Original Message-----

From: Hudson, Jayson M CIV USARMY CESWG (USA) <Jayson.M.Hudson@usace.army.mil>

Sent: Tuesday, May 5, 2020 11:14 AM

To: Ardizzone, Charles <chuck_ardizzone@fws.gov>; Houston. robert@epa.gov; Samson, Yvonne (Y) <ysamson@dow.com>; Roco, Coleen <Colleen.Roco@tpwd.texas.gov>; Allison Buchtien <Allison.Buchtien@GLO.TEXAS.GOV>; Kaspar, Paul <kaspar.paul@epa.gov>; Jenna. Lueg@tceq.texas.gov; 401CERTS <401CERTS@tceq.texas.gov>; Bill. Martin@thc.state.tx.us; Amy Nunez <Amy.Nunez@GLO.TEXAS.GOV>; Hoth, David <david_hoth@fws.gov>
Cc: Whitney Fiore <wfiore@swca.com>; Christine Hartmann <Christine.Hartmann@swca.com>; Kara Giblin <KGiblin@swca.com>; McMahan, Joseph A CIV USARMY CESWG (USA) <Joseph.A.Mcmahan@usace.army.mil>; HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>
Subject: RE: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting

EXTERNAL: This email originated from outside SWCA. Please use caution when replying.

Correction, Tuesday May 12th.

Jayson M Hudson
Regulatory Project Manager
409.766.3108

Please tell me how I am doing by completing the survey found at:
http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

-----Original Message-----

From: Hudson, Jayson M CIV USARMY CESWG (USA)
Sent: Tuesday, May 5, 2020 10:12 AM
To: Ardizzone, Charles <chuck_ardizzone@fws.gov>; Houston. robert@epa.gov; Samson, Yvonne (Y) <YSamson@dow.com>; Roco, Coleen <Colleen.Roco@tpwd.texas.gov>; Allison Buchtien <Allison.Buchtien@GLO.TEXAS.GOV>; Kaspar Paul <Kaspar.Paul@epa.gov>; Jenna. Lueg@tceq.texas.gov; 401CERTS <401CERTS@tceq.texas.gov>; Bill. Martin@thc.state.tx.us; Amy Nunez <Amy.Nunez@GLO.TEXAS.GOV>; Hoth, David <david_hoth@fws.gov>
Cc: Whitney Fiore <wfiore@swca.com>; Christine Hartmann <Christine.Hartmann@swca.com>; Kara Giblin <KGiblin@swca.com>; McMahan, Joseph A CIV USARMY CESWG (USA) <Joseph.A.Mcmahan@usace.army.mil>; HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>
Subject: RE: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting

Hello,

I just wanted to send a reminder that the Corps will be hosting the Agency Scoping Meeting for the Dow Harris Reservoir Expansion EIS on Monday May 12th. If you plan to attend but have not RSVP'd, please let me know.

Thank you,

Jayson M Hudson
Regulatory Project Manager
409.766.3108

Please tell me how I am doing by completing the survey found at:
http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

-----Original Message-----

From: Hudson, Jayson M CIV USARMY CESWG (USA)

Sent: Tuesday, April 28, 2020 3:39 PM

To: Ardizzone, Charles <chuck_ardizzone@fws.gov>; Houston.robert@epa.gov; Samson, Yvonne (Y) <YSamson@dow.com>; Roco, Coleen <Colleen.Roco@tpwd.texas.gov>; Allison Buchtien <Allison.Buchtien@GLO.TEXAS.GOV>; Kaspar Paul <Kaspar.Paul@epa.gov>; Jenna.Lueg@tceq.texas.gov; 401CERTS <401CERTS@tceq.texas.gov>; Bill.Martin@thc.state.tx.us; Amy Nunez <Amy.Nunez@GLO.TEXAS.GOV>
Cc: Whitney Fiore <wfiore@swca.com>; Christine Hartmann <Christine.Hartmann@swca.com>; Kara Giblin <KGiblin@swca.com>; McMahan, Joseph A CIV USARMY CESWG (USA) <Joseph.A.Mcmahan@usace.army.mil>; HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>; Hudson, Jayson M CIV USARMY CESWG (USA) <Jayson.M.Hudson@usace.army.mil>

Subject: SWG-2016-01027 Dow Chemical Company Virtual Agency Scoping Meeting

The U.S. Army Corps of Engineers will be hosting a Virtual Agency Scoping Meeting for the Dow Chemical Company's Harris Reservoir Expansion EIS on May 12th from 9-11:30am. The purpose of the public scoping process is to identify relevant issues that will influence the scope of the environmental analysis and EIS alternatives.

The meeting will be hosted online at:

<https://usace.webex.com/meet/jayson.m.hudson>

You may use the website audio or call in on a telephone at:

Phone: 877-336-1839

Access: 426 9357#

Code: 1027#

If you call in from a telephone, please make sure to include your participant ID provided by the website when logging in. The participant ID will assist in facilitating the meeting. The meeting will be recorded for transcription into the administrative record.

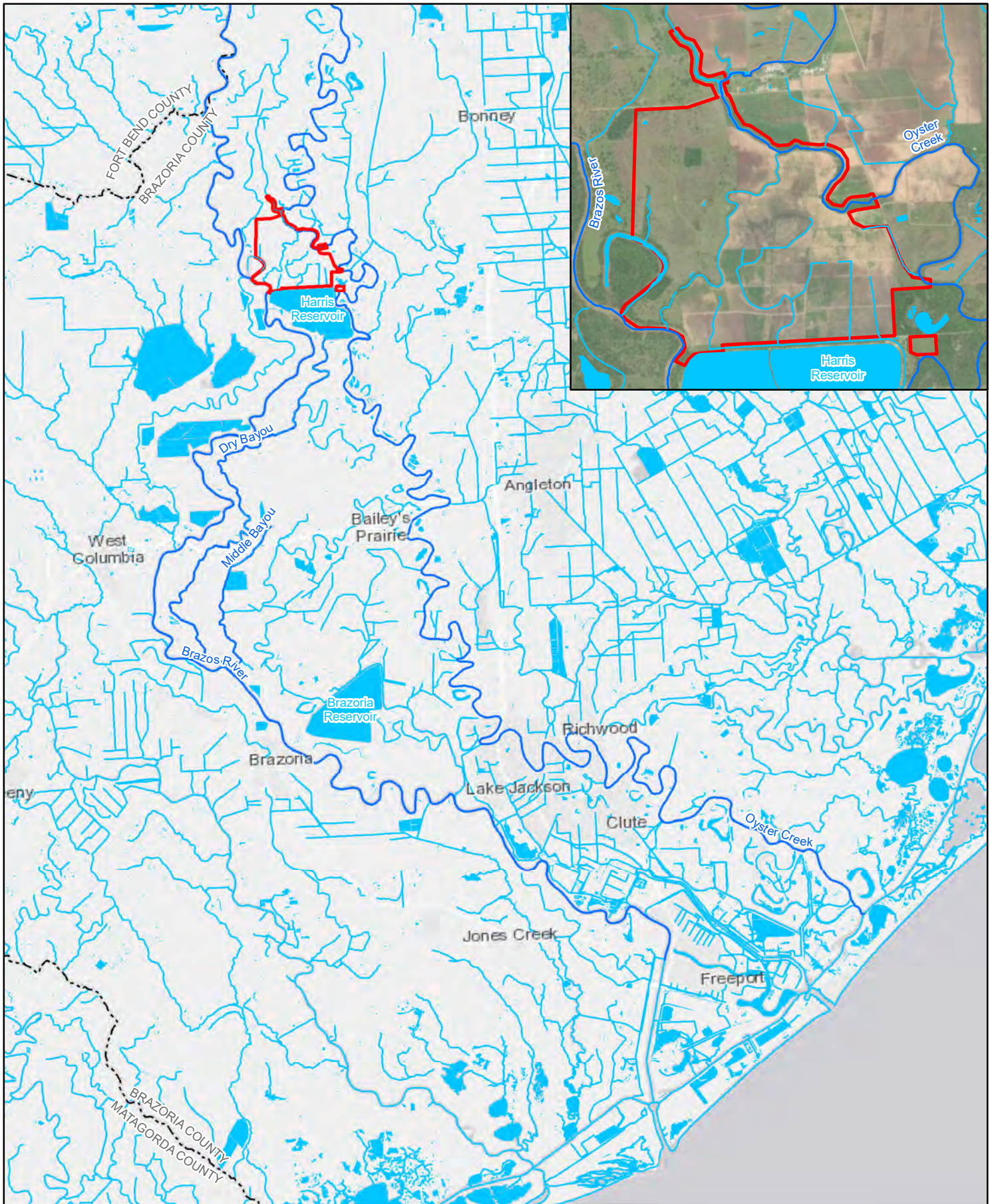
For additional information on the project, including the initial public notice and the significance determination, please visit: <https://www.swg.usace.army.mil/Business-With-Us/Regulatory/Special-Projects-Environmental-Impact-Statements/>

Please respond to this email to confirm your agency's attendance.

Jayson M Hudson
Regulatory Project Manager
Policy Analysis Branch
Galveston District
409.766.3108

Please tell me how I am doing by completing the survey found at:

http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0



SWCA
 ENVIRONMENTAL CONSULTANTS

**DOW CHEMICAL HARRIS RESEVOIR
 EXPANSION PROJECT**
 SURFACE WATER MAP
 BRAZORIA COUNTY, TEXAS

FIGURE X

Project Site
 County Boundary

NHD

Waterbody

1:240,000

Created By: K. Shields
 Project Number: 52872
 Date: 2/4/2020
 NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

0 1 2 3 4 5 Miles
0 1 2 3 4 5 Kilometers

OYSTER CREEK HYDROMODIFICATION

FIGURE 2

HARRIS RESERVOIR EXPANSION EIS
EXISTING CONDITIONS BRAZOS RIVER






Drawn By: CB

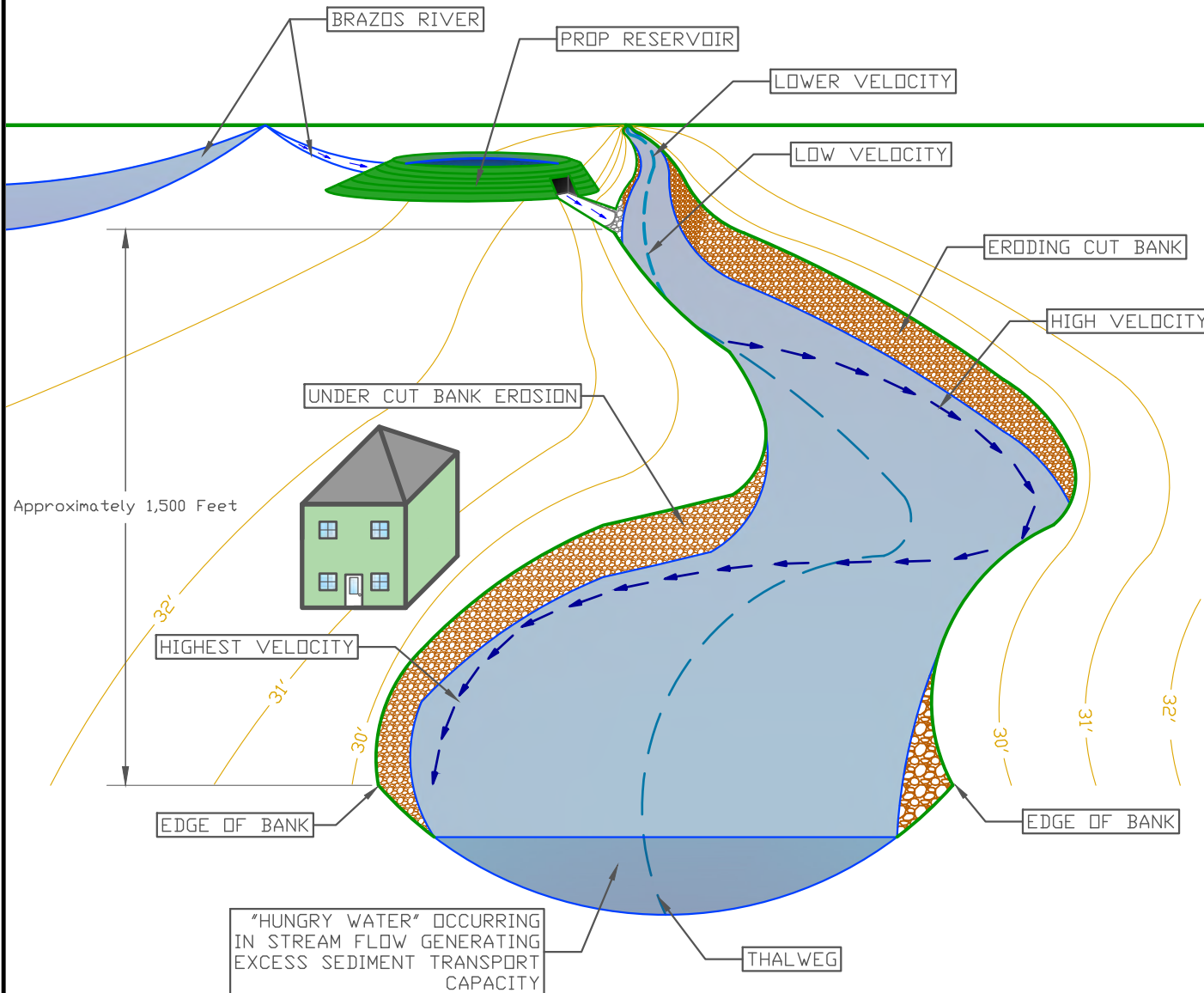
Approved By: JL

Drawing Date: APRIL 30, 2020



LEGEND

-  RIVER
-  EARTHEN LAND DETAIL
-  STRUCTURE
-  CONTOUR LINE
-  HIGHEST ENERGY FLOW PATH



UNACCOUNTED FLOODPLAIN STORAGE LOSS

FIGURE 1

HARRIS RESERVOIR EXPANSION EIS
EXISTING CONDITIONS BRAZOS RIVER














Drawn By: CB

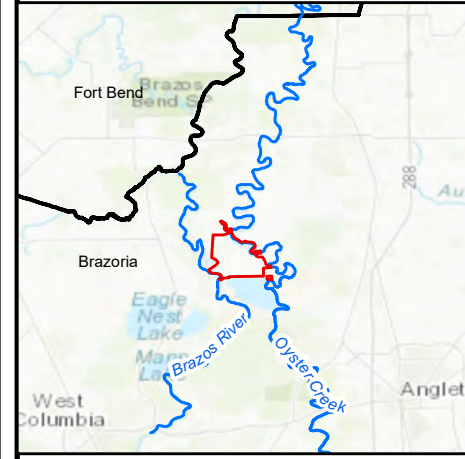
Approved By: JL

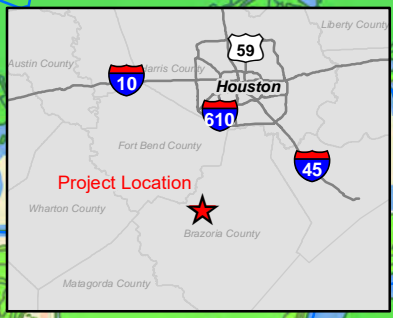
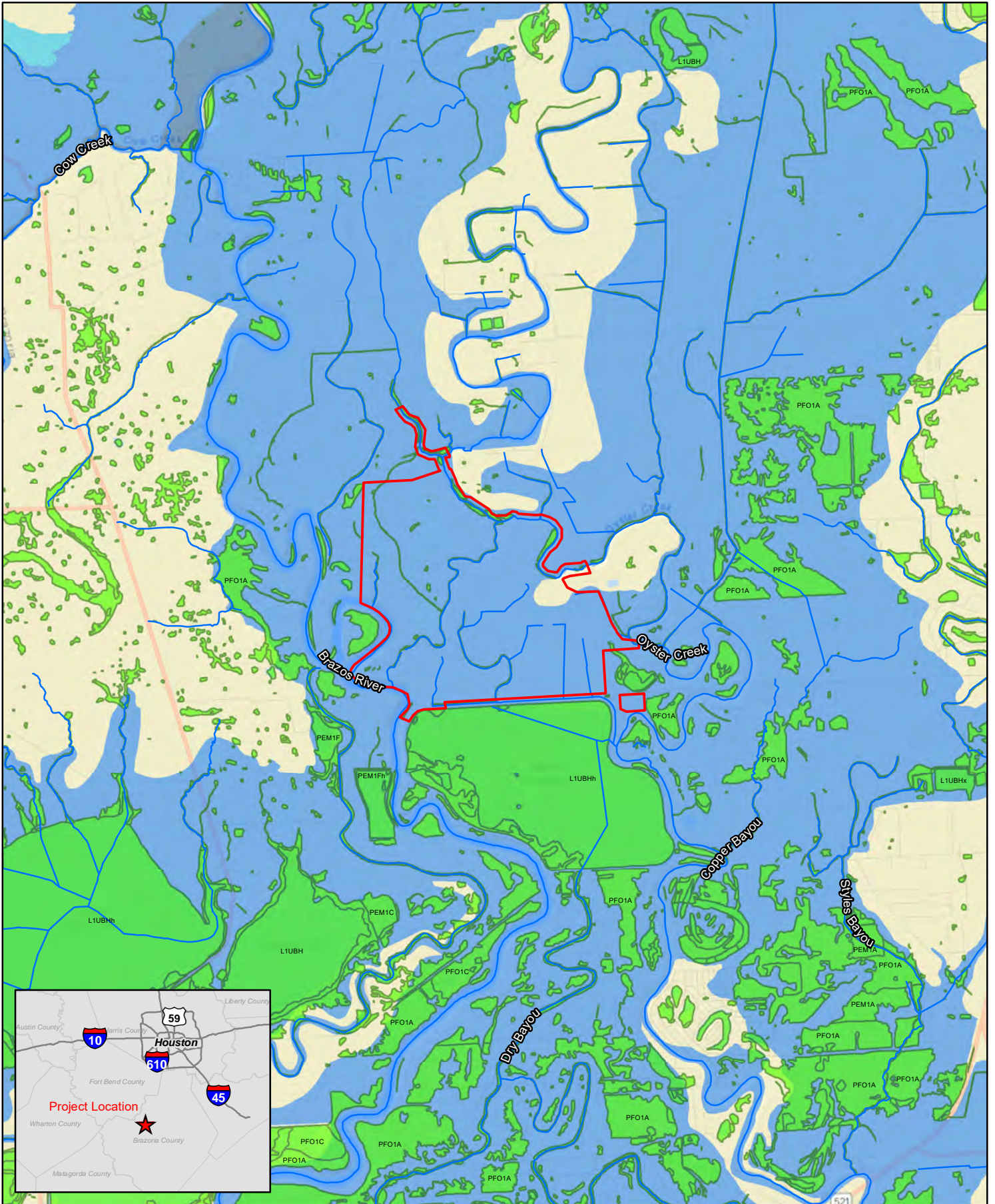
Drawing Date: APRIL 30, 2020

1 inch = 3,000 feet

Legend

-  Inlet Pipe
-  Spillway
-  Pump Station
-  Oyster Creek
-  Brazos River
-  Mitigated Floodplain Storage Loss
-  Proposed Reservoir Outer Embankment
-  Unaccounted Floodplain Storage Loss
-  Proposed Reservoir
-  Project Boundary
-  Proposed Grading Boundary
-  Roads
-  Existing Harris Reservoir





DOW CHEMICAL HARRIS RESEVOIR EXPANSION PROJECT
VICINITY MAP
BRAZORIA COUNTY, TEXAS

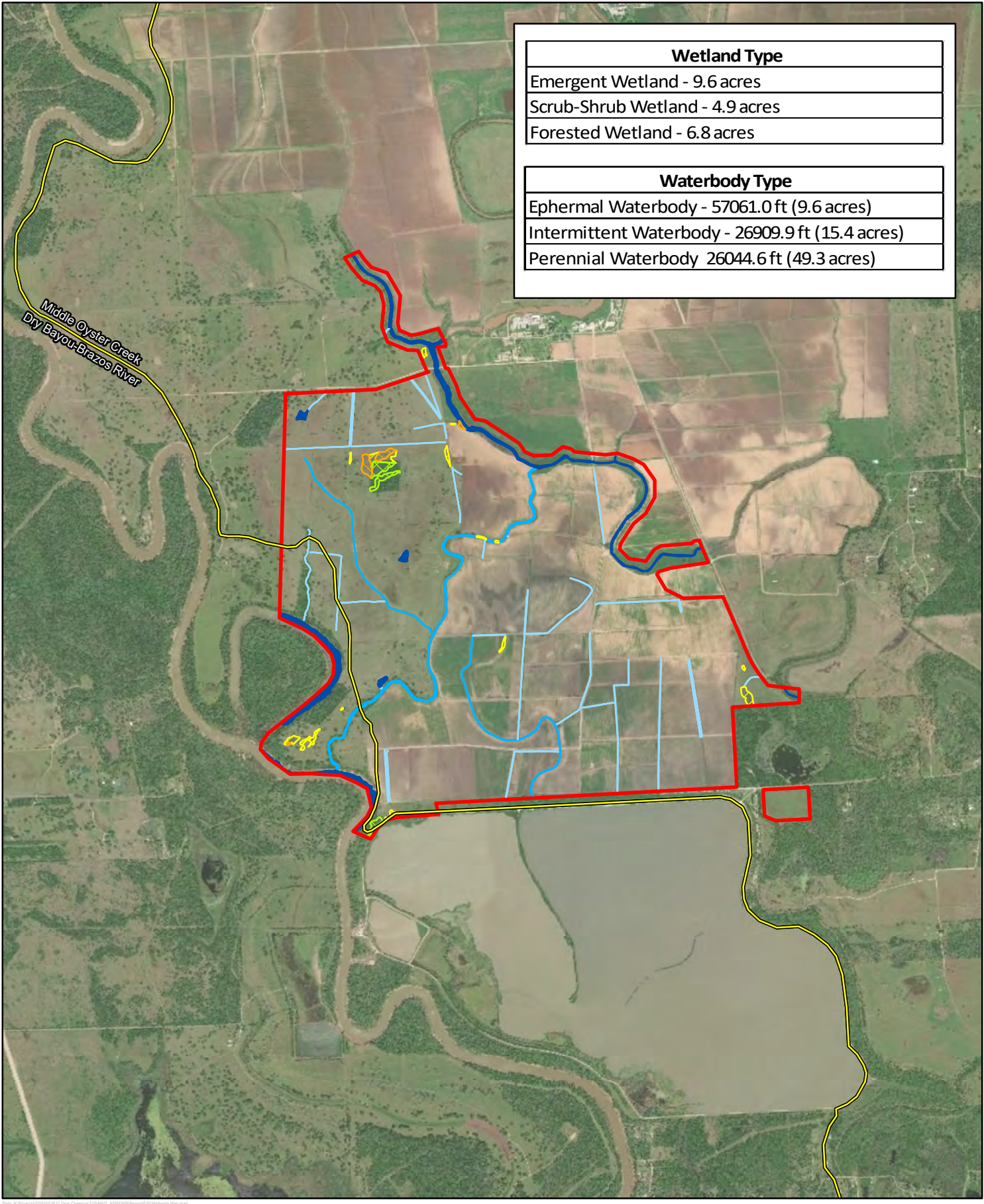
- Project Boundary
- Named NHD Stream
- NWI Wetlands
- 100-Year Floodplain (Floodway)
- 100-Year Floodplain
- 500-Year Floodplain



1:75,000

Created By: CM
 Project Number: 52872
 Date: 7/9/2019
 NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

FIGURE 1



Wetland Type	
Emergent Wetland	- 9.6 acres
Scrub-Shrub Wetland	- 4.9 acres
Forested Wetland	- 6.8 acres

Waterbody Type	
Ephemeral Waterbody	- 57061.0 ft (9.6 acres)
Intermittent Waterbody	- 26909.9 ft (15.4 acres)
Perennial Waterbody	26044.6 ft (49.3 acres)

	DOW CHEMICAL HARRIS RESEVOIR EXPANSION PROJECT WETLANDS MAP BRAZORIA COUNTY, TEXAS	Project Site	Emergent Wetland
		Ephemeral Waterbody	Scrub-Scrub Wetland
		Intermittent Waterbody	Forested Wetland
		Perennial Waterbody	Watershed Boundary

1:40,000

Created By: K. Shields
 Project Number: 52872
 Date: 5/4/2020
 NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

Appendix C

Meeting Materials

Dow Chemical Company's Harris Reservoir Expansion Environmental Impact Statement (SWG-2016-01027)

Interagency Scoping Meeting

Agenda

1. Roll Call
2. Introduction by COL Vail.
3. Dow project presentation
4. Corps process presentation
5. Solicitation of comments from state and federal agencies.

Harris Reservoir Expansion Project

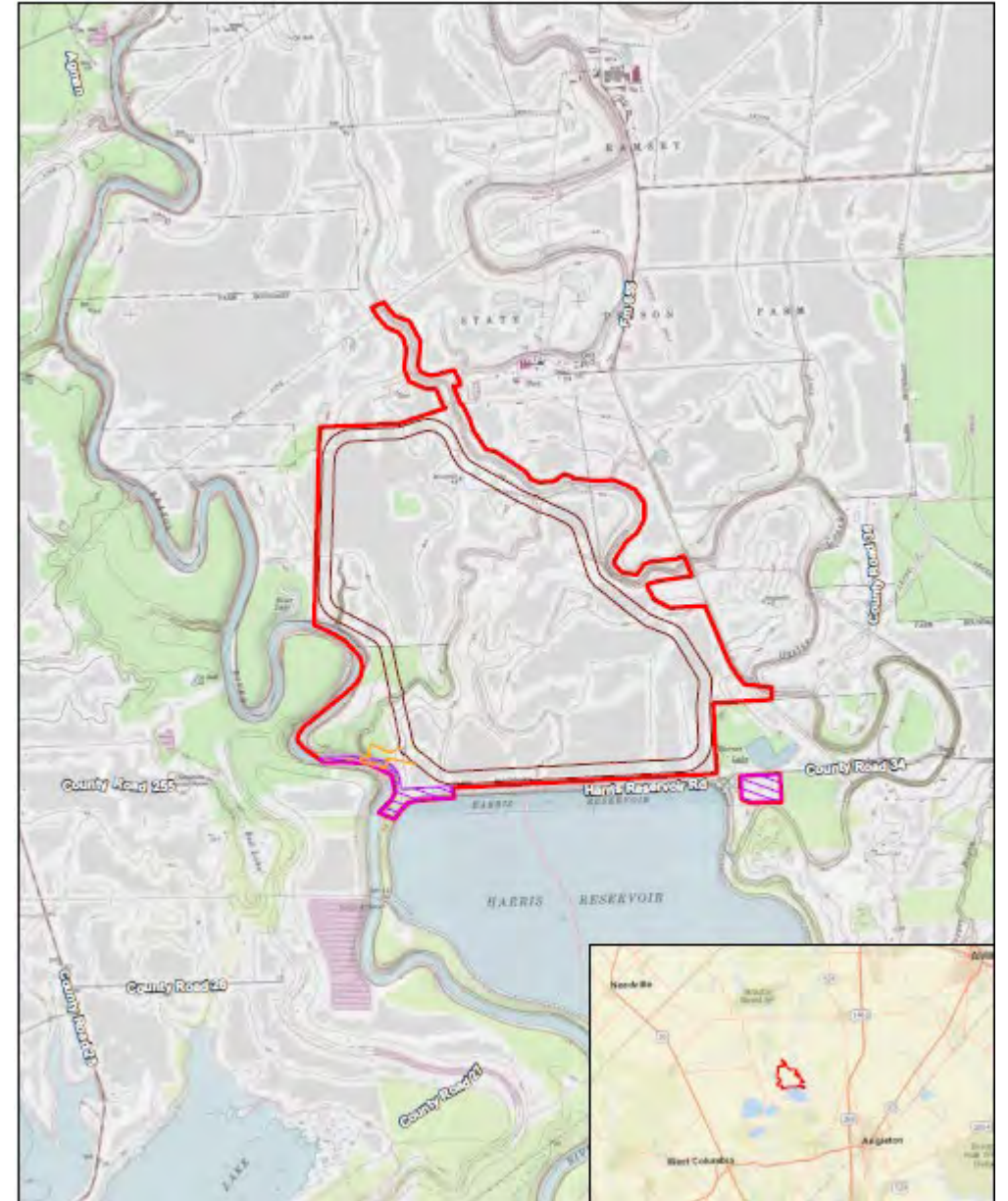


Date: 30-Apr-20
Greg Bond

High Level Scope

- The project is to construct a new off channel reservoir and pump station
- The facility will be located at Angleton, TX directly north of the existing Harris Reservoir
- The new reservoir will expand storage capacity by approximately 50,000 acre-ft and will add a new 150,000 GPM Pump Station which will improve reliability during drought.

Overall Vicinity Map



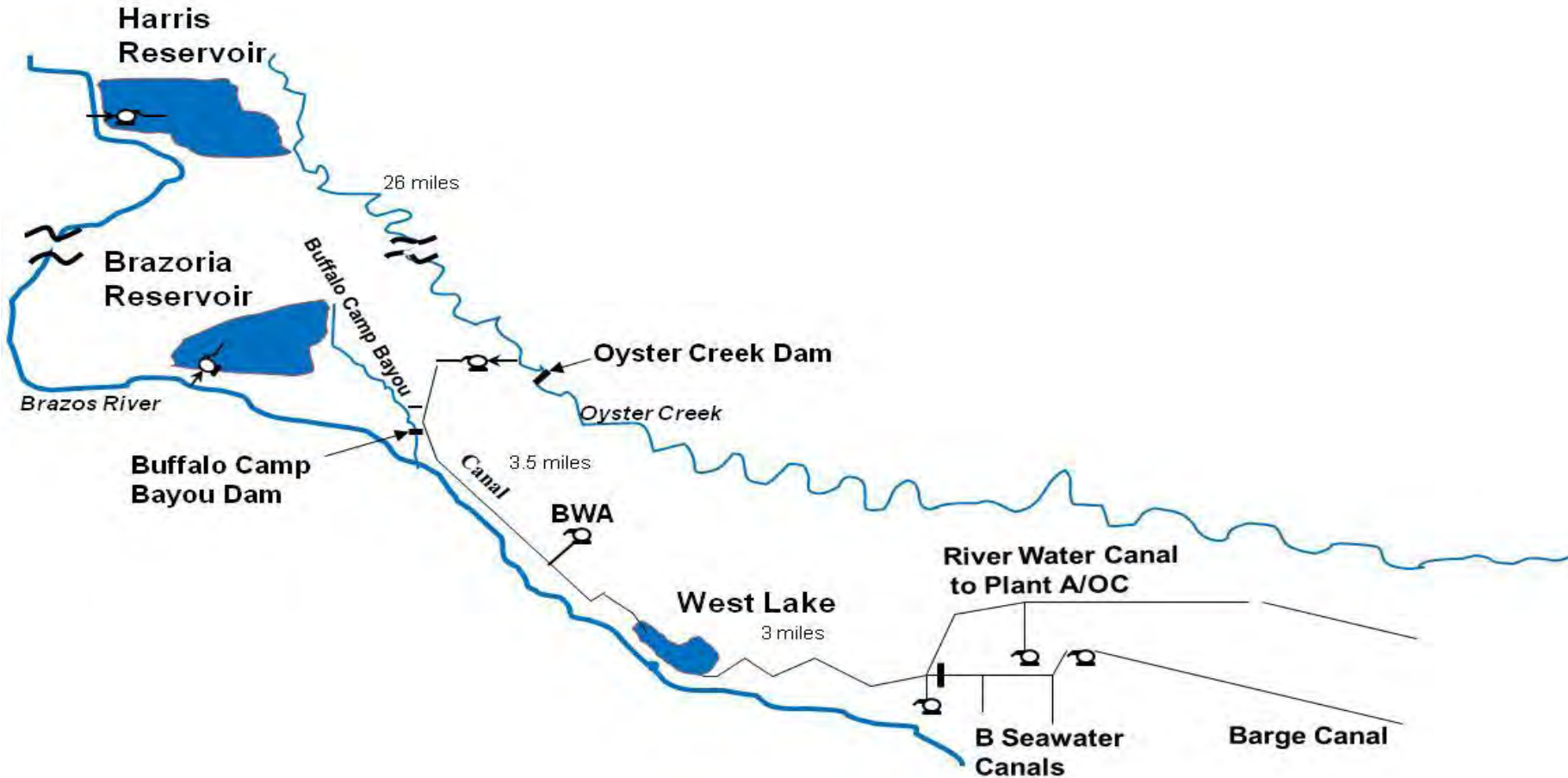
Why?

- ❖ **The additional pumping and storage capacity is required to provide adequate protection against seasonal drought events for Dow Texas Operations and other industrial and municipal users**
- ❖ **Extreme drought events, similar to those experienced in 2009 and 2011, resulting in low flows along the Brazos River have occurred at a frequency that can be expected to impact Dow's ability to supply regional fresh water demands 6-12% of the time without action.**
- ❖ **Project will allow region to meet TCEQ recommendations that 180 days of stored water is needed to provide adequate protection against these seasonal drought events. The current reservoir system including Brazoria and Harris reservoirs holds approximately 2 months of river water supply for Dow Texas Operations and regional partners. The proposed reservoir will add the recommended additional 4 months of river water supply.**
- ❖ **Dow has previously relied on the underutilized stored water resources of others, primarily contracted Brazos River Authority reserves, as a water supply supplement during these low flow events. Increasing basin wide demand and the increased awareness of drought susceptibility, brought on by recent drought events, have reduced and could soon entirely eliminate the availability of these supplemental supplies.**
- ❖ **Current water rights will not change with installation of new reservoir.**

Technology Being Used

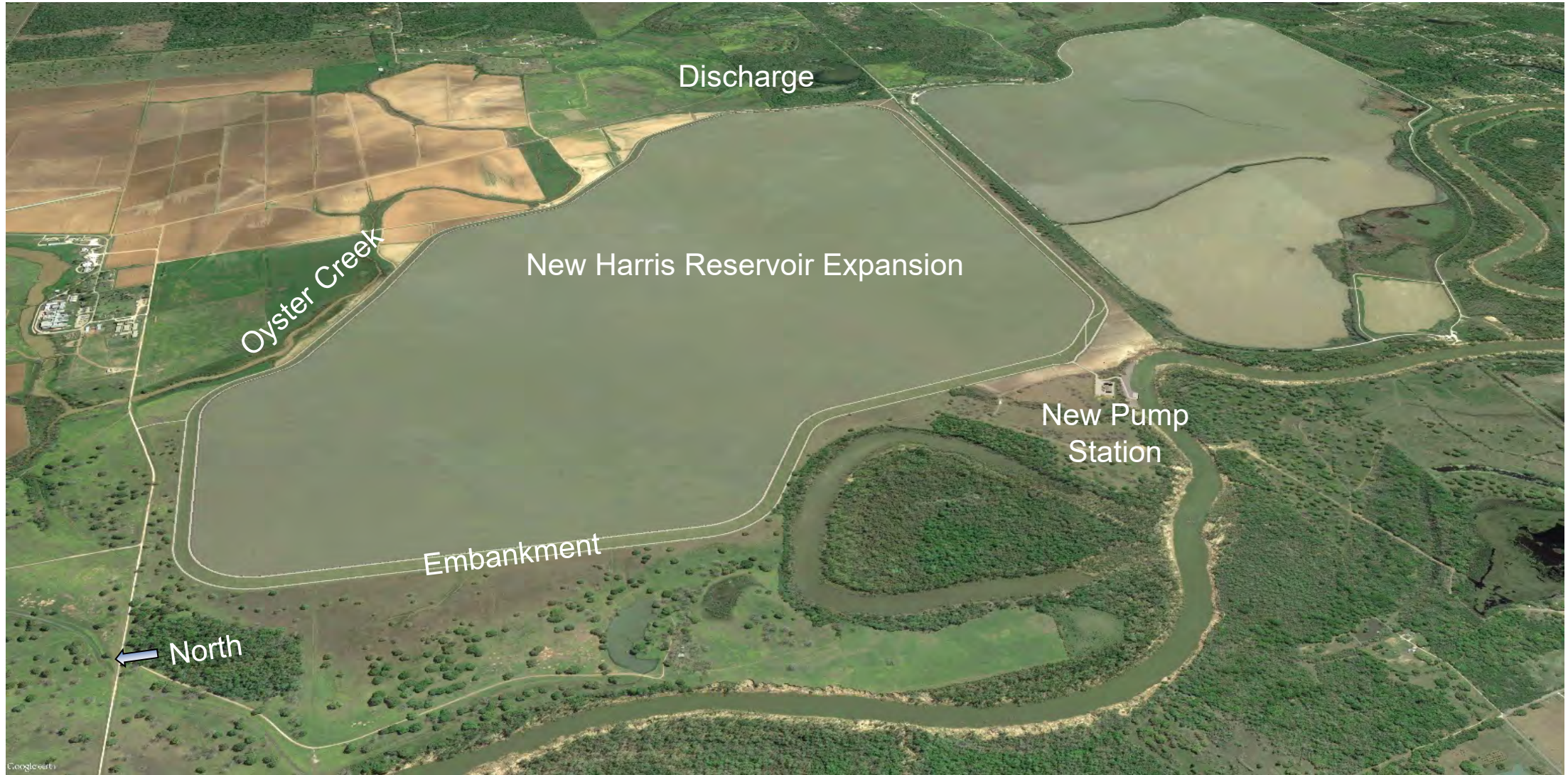
❖ Technology

- Harris Reservoir Expansion will be installed directly north of existing Harris Reservoir
 - Water will siphon into Oyster Creek and follow the same path as the water from the existing Harris Reservoir



Reproduced with permission from Dow.

Technology Being Used



Overall Plot Plan

Technology Being Used – Brazos River Intake

❖ Technology

- Intake screen with mechanical cleaning
 - Compliant with requirements



Side View of Brazos River Intake



Aerial view of Brazos River Intake

Technology Being Used – Pump Station

❖ Technology

- Pump station is based on Brazoria Reservoir pump station
 - Horizontal pumps with assorted foundations, pump house, piping, MCC building, etc.
 - Operations building



Aerial View of Operations Building (L), Pump Station (C),
and MCC Building (R)

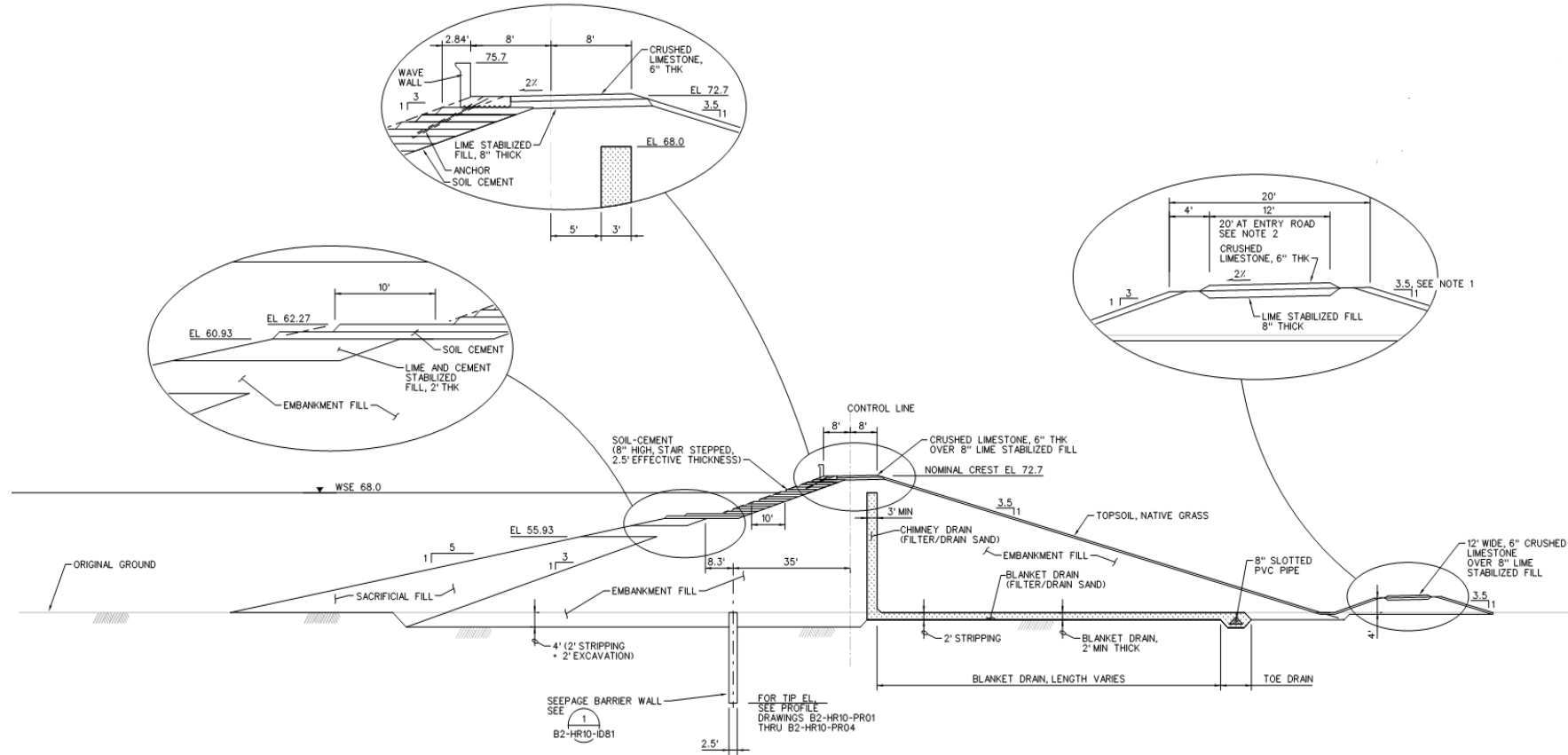


Internal View of Pump House

Technology Being Used - Embankment

❖ Technology (cont.)

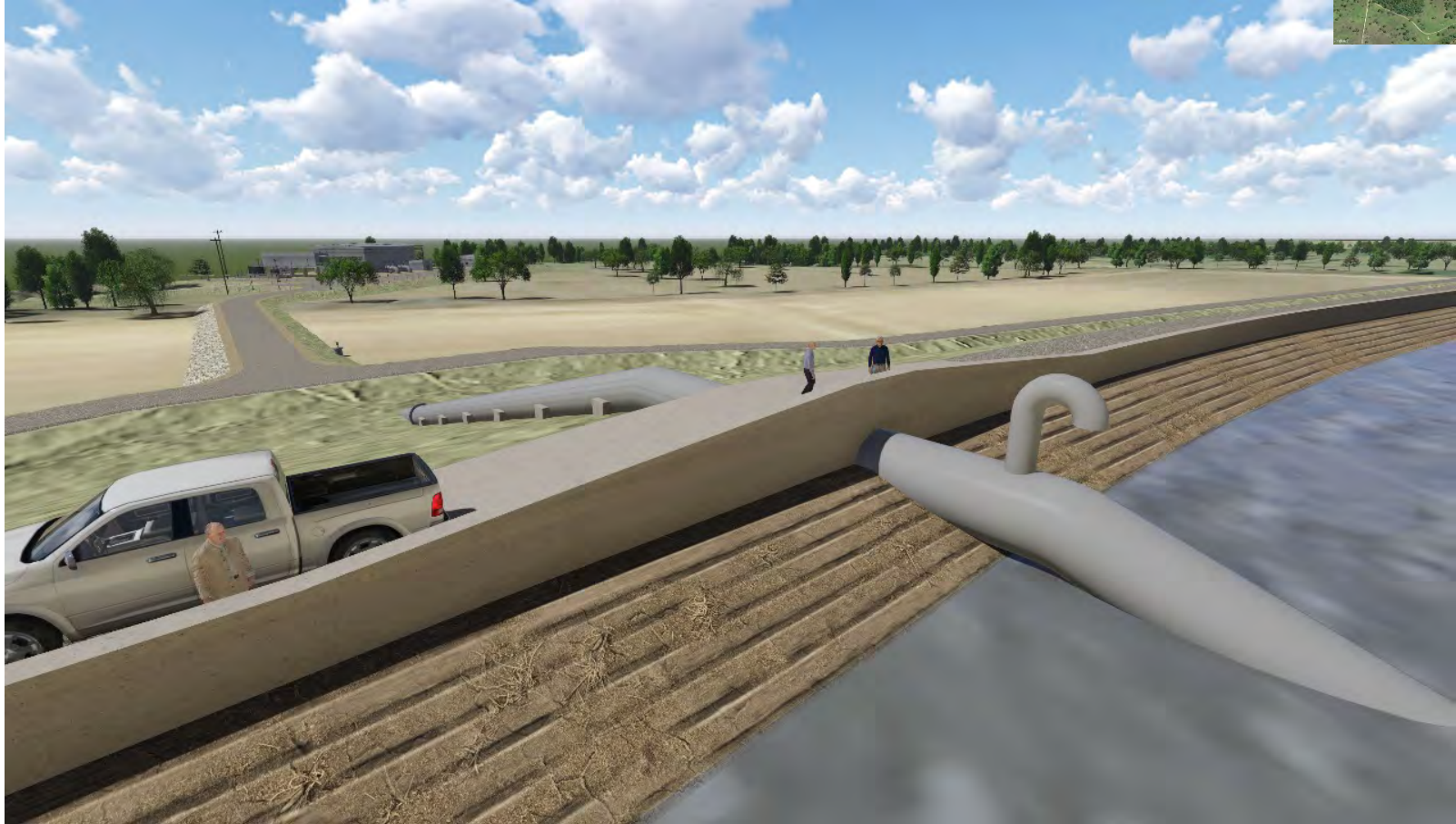
- Design of actual levee around reservoir
 - Review of design with TCEQ Dam Safety Board, other reservoirs, and outside technical review board.



A TYPICAL EMBANKMENT SECTION
1"=15'

Technology – Reservoir Inlet Pipe

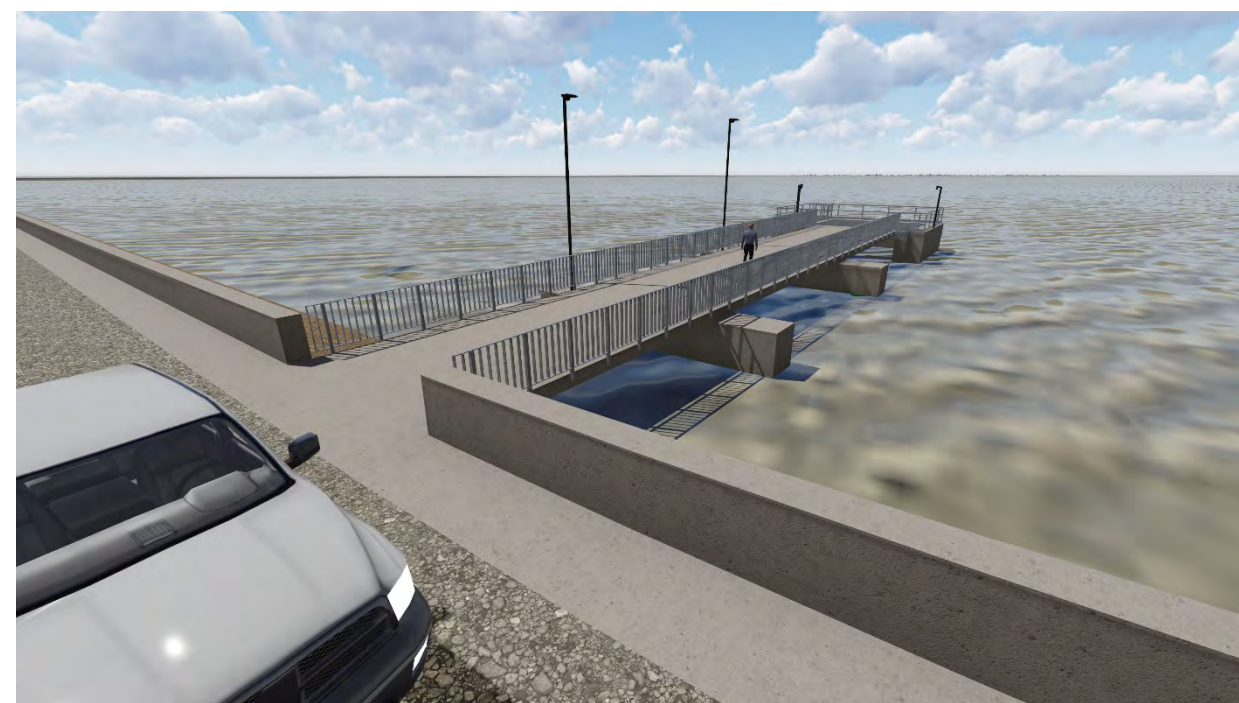
- ❖ Technology
 - Inlet piping with stilling basin in reservoir



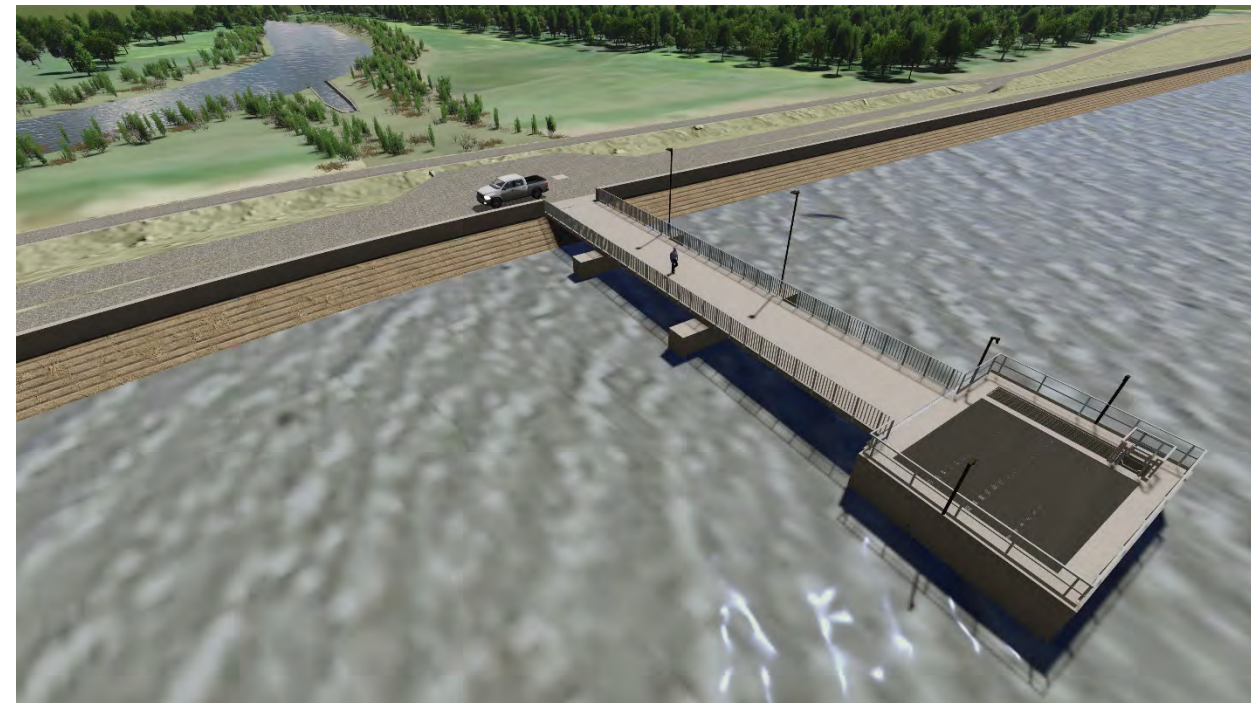
Reservoir inlet piping at crest of reservoir looking southwest with pump station area in background

Technology Being Used – Discharge

- ❖ Technology
 - ❖ Combined emergency outlet/outlet structure



Combined Outlet Structure Looking Towards the Reservoir



Combined Outlet Structure Looking Towards Oyster Creek

Technology Being Used – Flood Plain Mitigation

❖ Technology

- ❖ Flood plain mitigation project #1
 - ❖ Aligns flow of channel with flood plain mitigation requirements
 - ❖ Flood mitigation and stream enhancement design to follow industry best practices
 - ❖ Approximately 2,400 feet of floodplain conveyance and storage improvements
 - ❖ Incorporation of a flood plain bench on both channel banks
 - ❖ Layback of channel banks
 - ❖ Preservation of existing riparian buffer

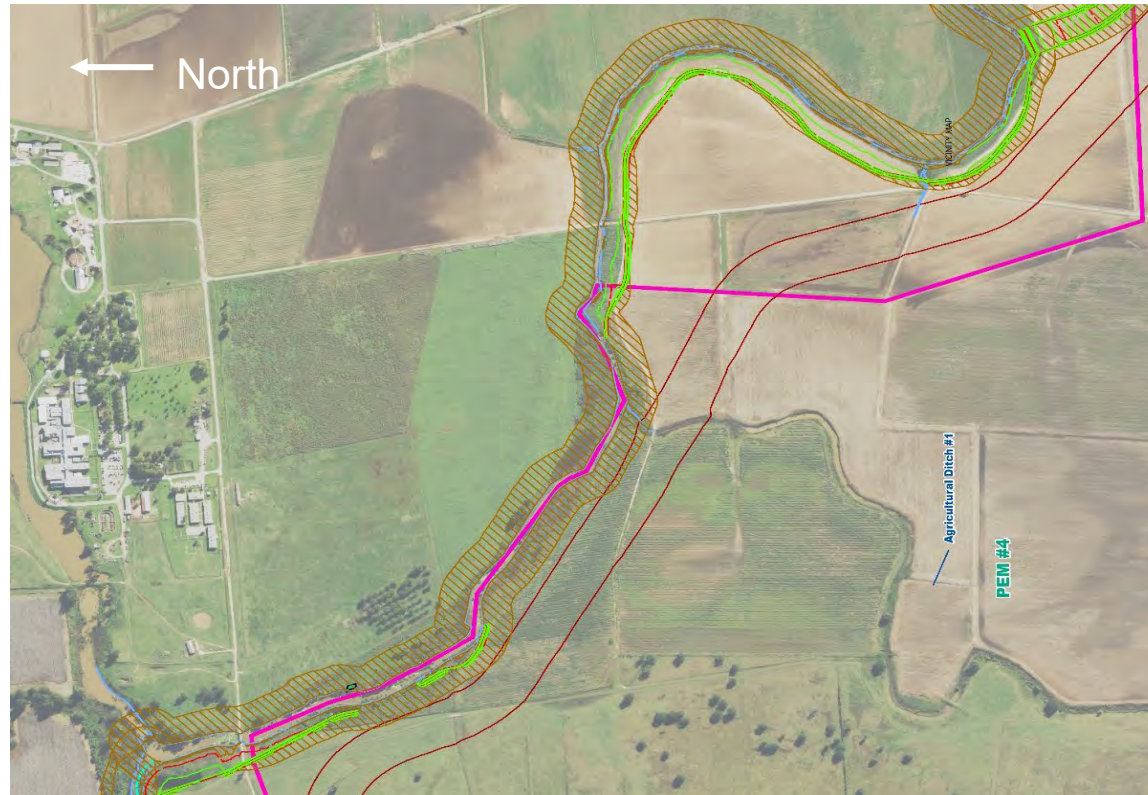


Flood Plain Mitigation Project #1

Technology Being Used – Flood Plain Mitigation

❖ Technology

- ❖ Flood plain mitigation project #2
 - ❖ Aligns flow of channel with flood plain mitigation requirements
 - ❖ Flood mitigation and stream enhancement design to follow industry best practices
 - ❖ Approximately 7,800 feet of floodplain conveyance and storage improvements
 - ❖ Incorporation of a flood plain bench on west channel bank
 - ❖ Preservation of existing riparian buffer
 - ❖ Buffer re-establishment

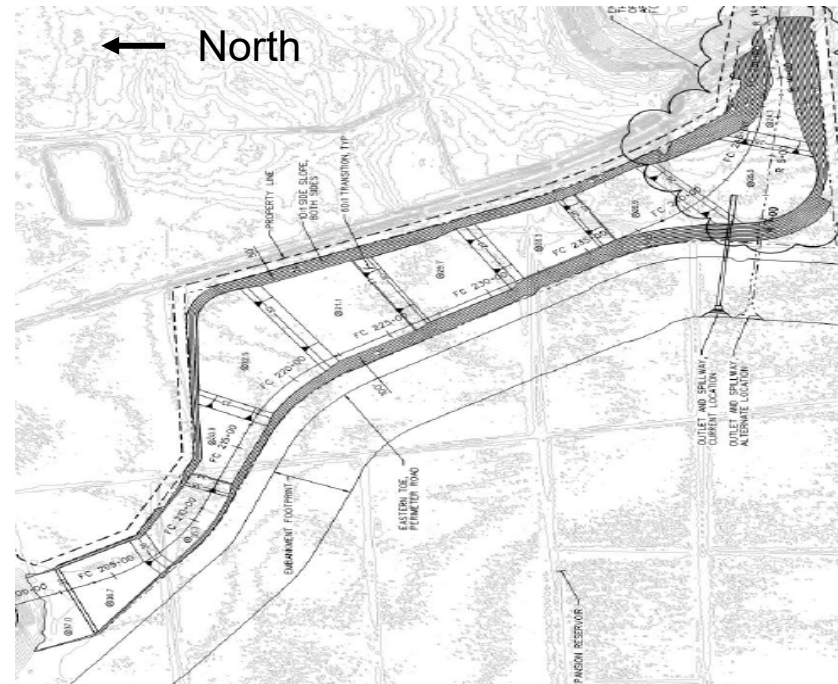


Flood Plain Mitigation Project #2

Technology Being Used – Flood Plain Mitigation

❖ Technology

- ❖ Flood plain mitigation project #3
 - ❖ Aligns flow of channel with flood plain mitigation requirements
 - ❖ Flood mitigation and stream enhancement design to follow industry best practices
 - ❖ Re-establishes an ephemeral channel within the existing floodplain (i.e. channel creation)
 - ❖ Broad crested weir on south bank of Oyster Creek to maintain low flows in Oyster Creek
 - ❖ Conveys overflows from Oyster Creek during high flows (approximately 10-year or greater magnitude flood events)
 - ❖ Will accommodate the reservoir outlet and spillway



Flood Plain Mitigation Project #3

Master Project Schedule (Milestones)

Key Milestone		Comments
FEL3 Project Kickoff	Nov. 2017	
Permit Submittal	Feb. 2018	
Detail Design Kickoff	Jan. 2021	Critical Path
Permit Approval	Apr. 2022	
Start Construction	Aug. 2022	Critical Path
Complete Detail Design	Mar. 2023	
Construction Complete	Aug. 2025	Critical Path
Release to Operations (RTO)	Sept. 2025	Critical Path
Reservoir Filling Complete	Jan. 2026	Critical Path

DOW CHEMICAL COMPANY'S HARRIS RESERVOIR EXPANSION ENVIRONMENTAL IMPACT STATEMENT (SWG-2016-01027)

INTERAGENCY SCOPING MEETING

May 12, 2020

Jayson Hudson – USACE Regulatory Project Manager



US Army Corps
of Engineers®



OBJECTIVES

- Overview of relevant laws, rules, regulations and executive orders
- Introduce project team
- Identify Purpose and Need and Potential Alternatives
- Review the EIS content and known environmental concerns

APPLICABLE LAWS, RULES, REGULATIONS, AND EXECUTIVE ORDERS

US Army Corps Of Engineers

- Section 10 of the Rivers and Harbors Act of 1899
- Section 404 of the Clean Water Act
- Executive Order 13807 Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure

Cooperating/Participating

- Section 401 of the Clean Water Act
- The Coastal Zone Management Act
- Endangered Species Act
- National Historic Preservation Act



E.O. 13807

E.O. 13807 - requires Federal agencies to process environmental reviews and authorization decisions for "major infrastructure projects" as One Federal Decision (OFD). That means that all Federal agencies with environmental review, authorization, or consultation responsibilities for major infrastructure projects to develop a single Environmental Impact Statement (EIS) for such projects, sign a single Record of Decision (ROD) and issue all necessary authorizations within 90 days of the ROD.



DESCRIPTION OF PERMIT TIMELINE

- Initial Application Received:
 - February 21, 2018
- Initial Public Notice
 - March 29, 2018
- Significance Determination (EIS)
 - October 1, 2018
- Purpose and Need Concurrence
 - February 6, 2020
- Notice of Intent
 - April 7, 2020
- **Agency Scoping Meeting**
 - **May 12, 2020**
- Notice of Availability of Draft EIS
 - June 30, 2021
- Public Hearing & Comment Period
 - July 2021
- Notice of Availability of the Final EIS
 - February 7, 2022
- Notice of Record of Decision
 - April 7, 2022

EIS TEAM AND ROLES

Lead Federal Agency for NEPA

U.S. Army Corps of Engineers, Galveston District

Cooperating Agencies

Environmental Protection Agency

US Fish and Wildlife Service

Participating Agencies

Texas Commission On Environmental Quality

Texas Parks and Wildlife Department

Texas Historical Commission

Applicant

Dow Chemical Company

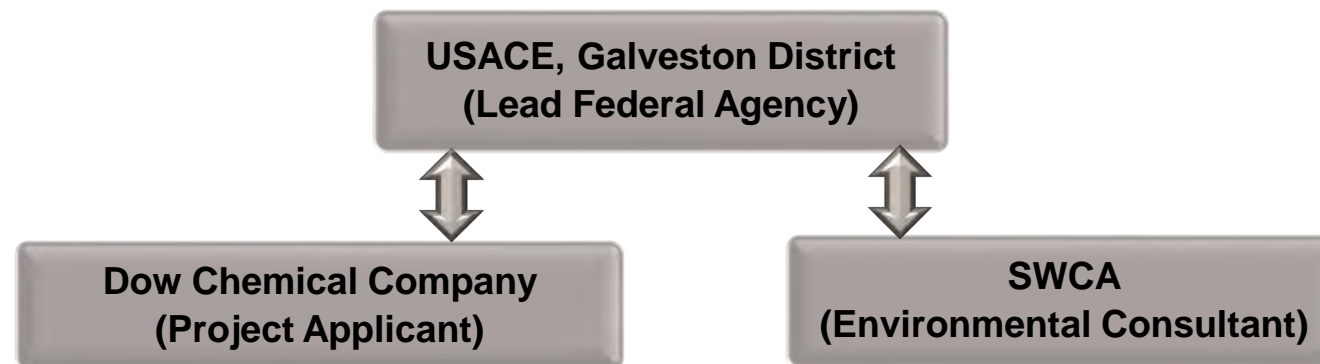
Environmental Impact Statement Contractor

SWCA Environmental Consultants

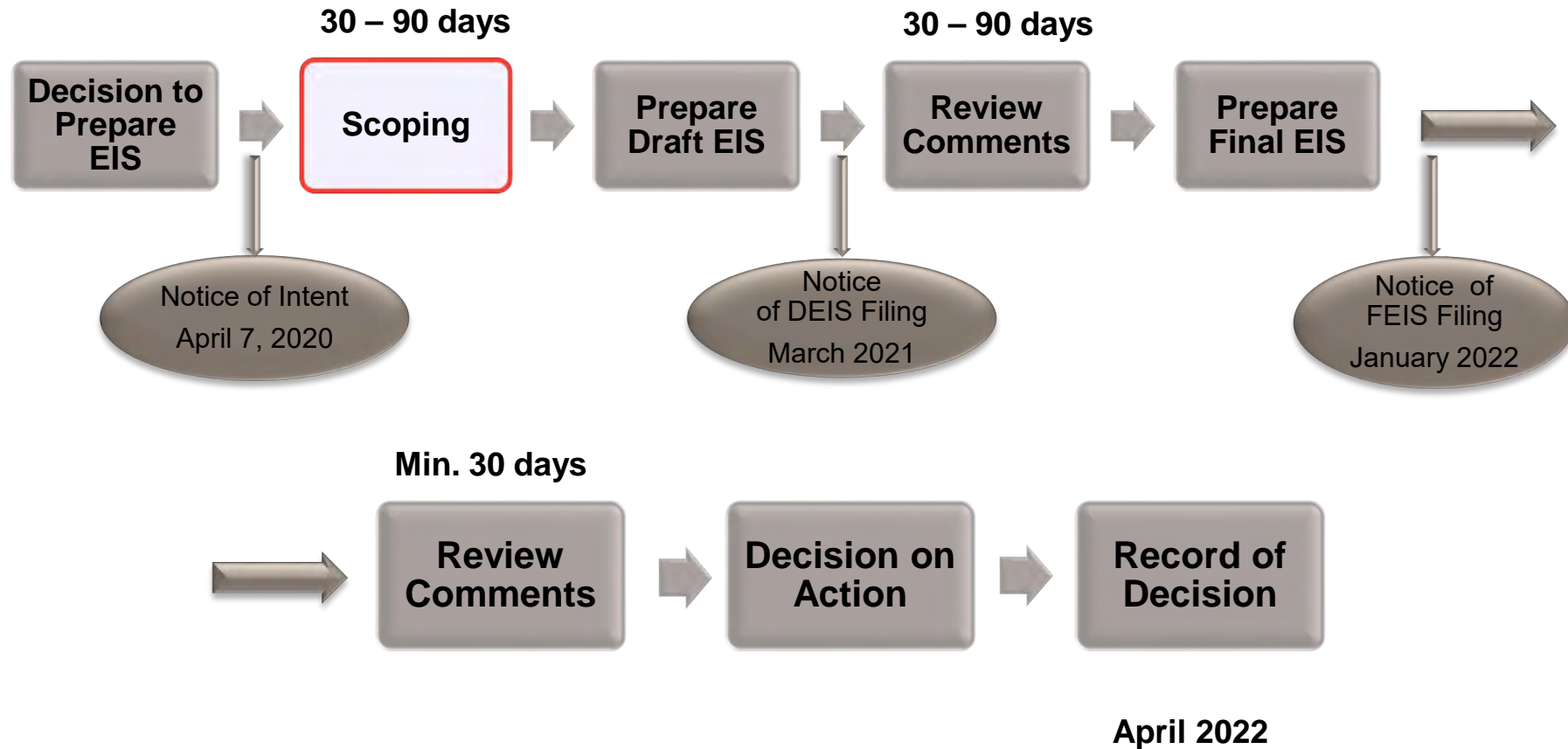


NEPA THIRD-PARTY CONTRACTING

- Lead Federal agency, project applicant, and environmental consultant enter into an agreement for preparation of NEPA compliance documentation (EIS)
- Project applicant pays environmental consultant for services related to preparation of documentation
- Environmental consultant prepares documentation under direction of the US Army Corps of Engineers
- Lead Federal agency is responsible for:
 - Guiding and participating in NEPA process and EIS preparation
 - Independent evaluation of the EIS prior to approval
 - Takes responsibility for the scope and contents of the EIS



ENVIRONMENTAL IMPACT STATEMENT PROCESS



SCOPING PROCESS

The overall goal is to define the scope of issues to be addressed in depth in the analyses that will be included in the EIS. Specifically, the scoping process will:

- Identify people or organizations who are interested in the proposed action;
- Identify the significant issues to be analyzed in the EIS;
- Identify and eliminate from detailed review those issues that will not be significant or those that have been adequately covered in prior environmental review;
- Determine the roles and responsibilities of lead and cooperating agencies;
- Identify any related Environmental Assessments or EISs;
- Identify gaps in data and informational needs;
- Set time limits for the process and page limits for the EIS;
- Identify other environmental review and consultation requirements so they can be integrated with the EIS;
- Indicate the relationship between the development of the environmental analysis and the agency's tentative decision making schedule.

EIS CONTENT

- Introduction, Purpose and Need
- Description and Evaluation of Alternatives
- Affected Environment/ Environmental Consequences
 - General Setting, Physiography, and Topography
 - Geology
 - Physical Oceanography
 - Coastal Processes
 - Water and Sediment Quality
 - Freshwater Inflow
 - Hydrology
 - Soils
 - Energy and Mineral Resources/ Hazardous, Toxic, and Radioactive Waste
 - Air Quality
 - Noise
 - Wetlands & Sea grasses
 - Aquatic Resources
 - Wildlife Resources
 - Threatened and Endangered Species
 - Cultural Resources
 - Socioeconomic Resources
 - Navigation

SUPPORTING STUDIES

– EIS Appendices

- Clean Water Act 404(b)(1) Evaluation
 - Endangered Species Biological Assessment
 - Texas Coastal Zone Consistency Determination
 - Hydrology & Hydraulic Studies
 - Planning-level floodplain storage analysis
 - Compensatory mitigation plan
 - Biological Assessment
 - Phase 2 Archaeological Study
- Geomorphic Assessment of Oyster Creek



PURPOSE AND NEED STATEMENT

Basic project purpose, as determined by the Corps: To improve the reliability of the water supply system that serves Dow's Texas Operations in Freeport during extended drought conditions.

Determination: The proposed project does not require access or proximity to, or siting within, a special aquatic site in order to fulfill its basic purpose. Alternatives that do not involve impacts to special aquatic sites are presumed to be available.

Overall project purpose, as determined by the Corps: To utilize Dow's existing run-of-river water rights from the Brazos River to improve reliability during extended drought conditions for the existing water supply system that serves Dow's Texas Operations in Freeport. Based on modeling, Dow estimates that 78,000 acre-feet of water storage capacity is necessary to provide Texas Commission on Environmental Quality's recommended 180 days of drought resilience.

ALTERNATIVES FROM EARLY SCOPING

- No Action
 - Permit Denial
- Applicant's Preferred Alternative
 - Harris Reservoir Expansion
- Reservoir Alternatives
 - Deepening/Expanding Existing Reservoirs
 - Desalination Plant
- Oyster Creek Alternatives
 - On-site design alternatives that reduce impact.

ENVIRONMENTAL CONCERNS FROM EARLY SCOPING

- Wetlands And Stream Impacts
- Threatened And Endangered Species
- Wildlife And Aquatic Species Impacts
- Archaeological And Cultural Resources
- Water Quality
- Sediment and Erosion
- Recreation And Recreational Resources
- Hazardous Waste And Materials
- Socioeconomics
- Public Benefit And Needs Of The People
- Cumulative Impacts

HOW TO SUBMIT WRITTEN COMMENTS

Written comments regarding the proposed EIS scope should be addressed to:

Mr. Jayson Hudson
USACE, Galveston District
Regulatory Division
P.O. Box 1229
Galveston, Texas 77553-1229.

Or

SWG201601027@usace.army.mil

Emailed comments, including attachments, should be provided in .doc, .docx, .pdf or .txt formats.

Harris Reservoir Expansion Project

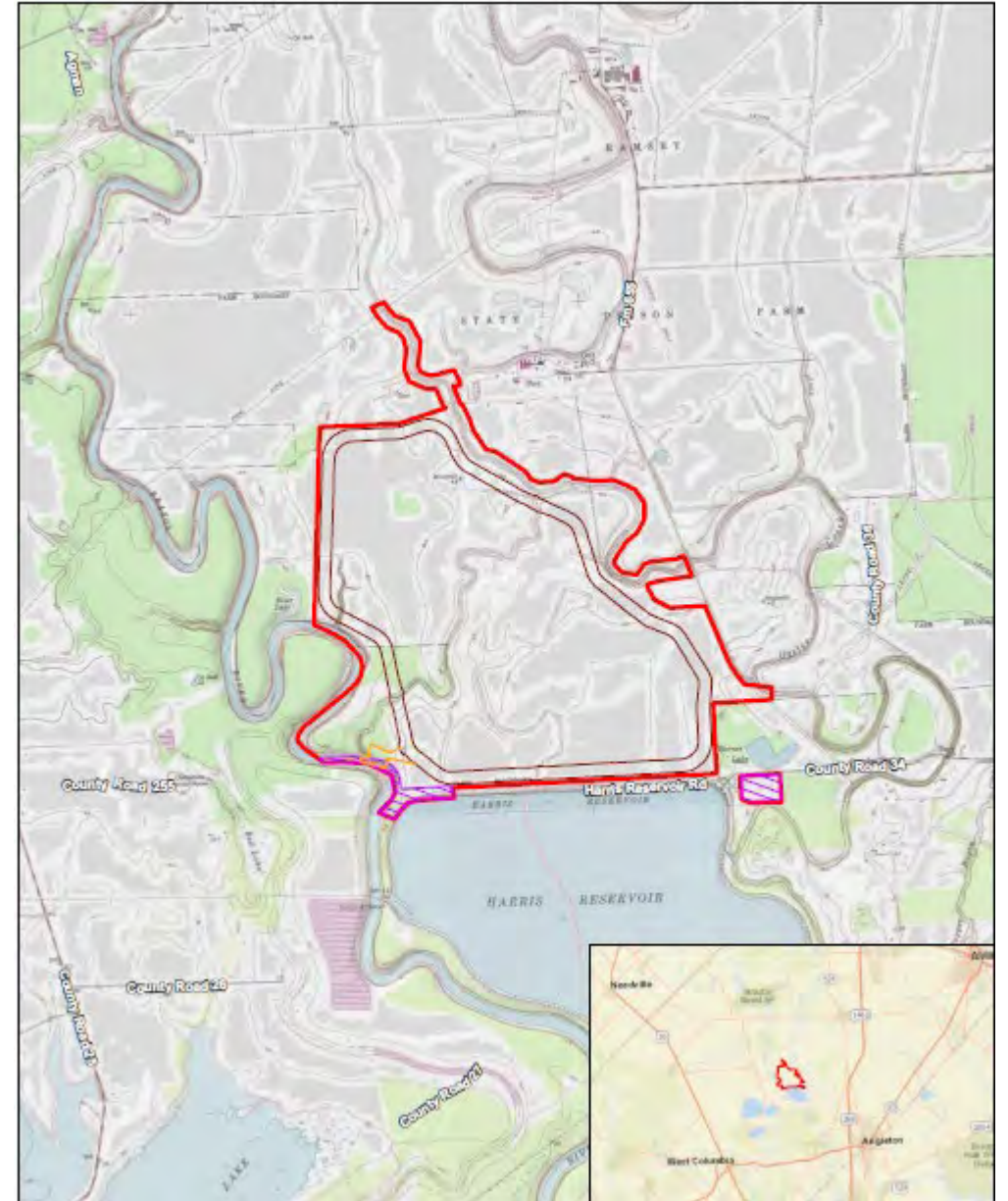


Date: 30-Apr-20
Greg Bond

High Level Scope

- The project is to construct a new off channel reservoir and pump station
- The facility will be located at Angleton, TX directly north of the existing Harris Reservoir
- The new reservoir will expand storage capacity by approximately 50,000 acre-ft and will add a new 150,000 GPM Pump Station which will improve reliability during drought.

Overall Vicinity Map



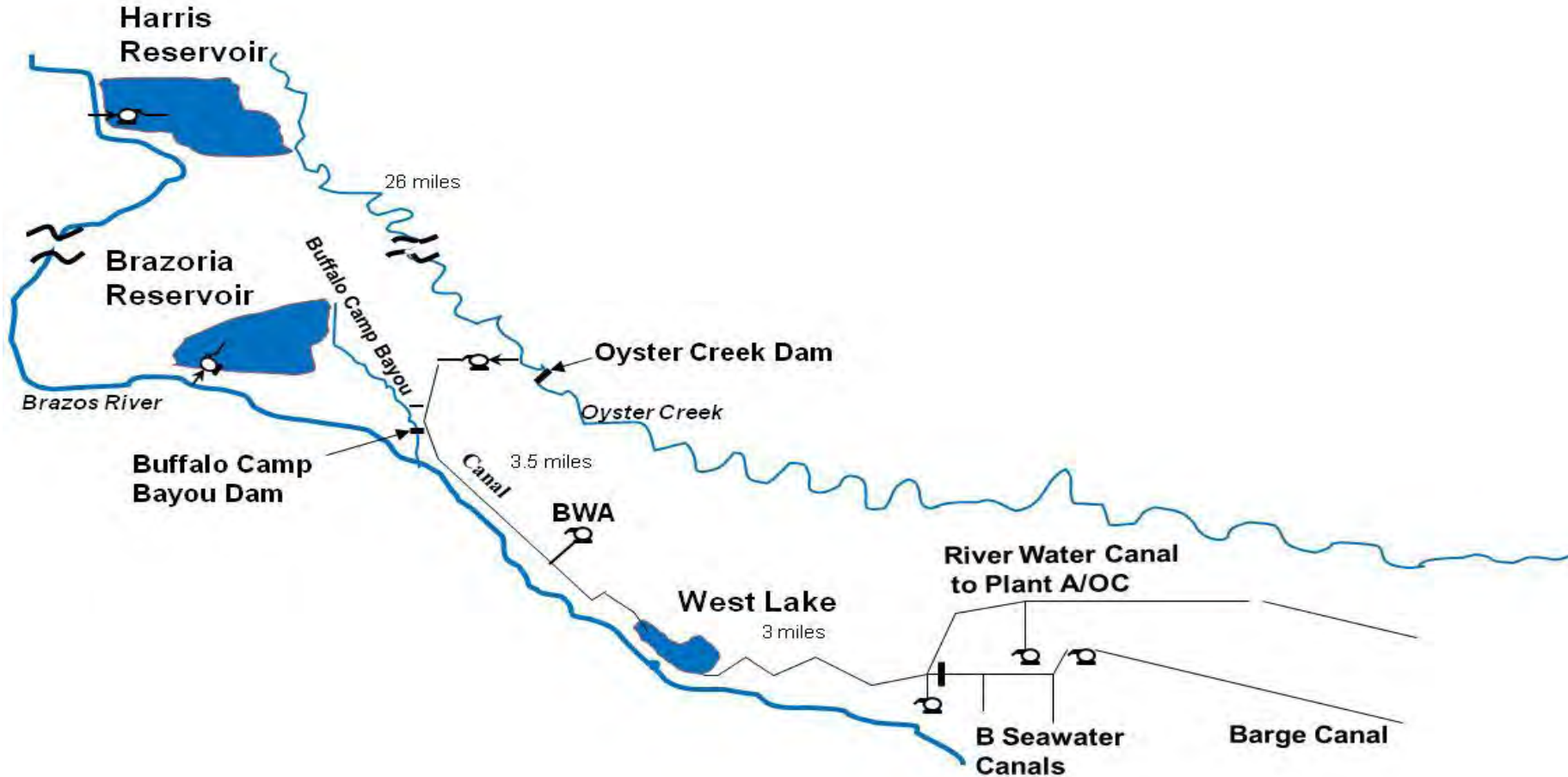
Why?

- ❖ **The additional pumping and storage capacity is required to provide adequate protection against seasonal drought events for Dow Texas Operations and other industrial and municipal users**
- ❖ **Extreme drought events, similar to those experienced in 2009 and 2011, resulting in low flows along the Brazos River have occurred at a frequency that can be expected to impact Dow's ability to supply regional fresh water demands 6-12% of the time without action.**
- ❖ **Project will allow region to meet TCEQ recommendations that 180 days of stored water is needed to provide adequate protection against these seasonal drought events. The current reservoir system including Brazoria and Harris reservoirs holds approximately 2 months of river water supply for Dow Texas Operations and regional partners. The proposed reservoir will add the recommended additional 4 months of river water supply.**
- ❖ **Dow has previously relied on the underutilized stored water resources of others, primarily contracted Brazos River Authority reserves, as a water supply supplement during these low flow events. Increasing basin wide demand and the increased awareness of drought susceptibility, brought on by recent drought events, have reduced and could soon entirely eliminate the availability of these supplemental supplies.**
- ❖ **Current water rights will not change with installation of new reservoir.**

Technology Being Used

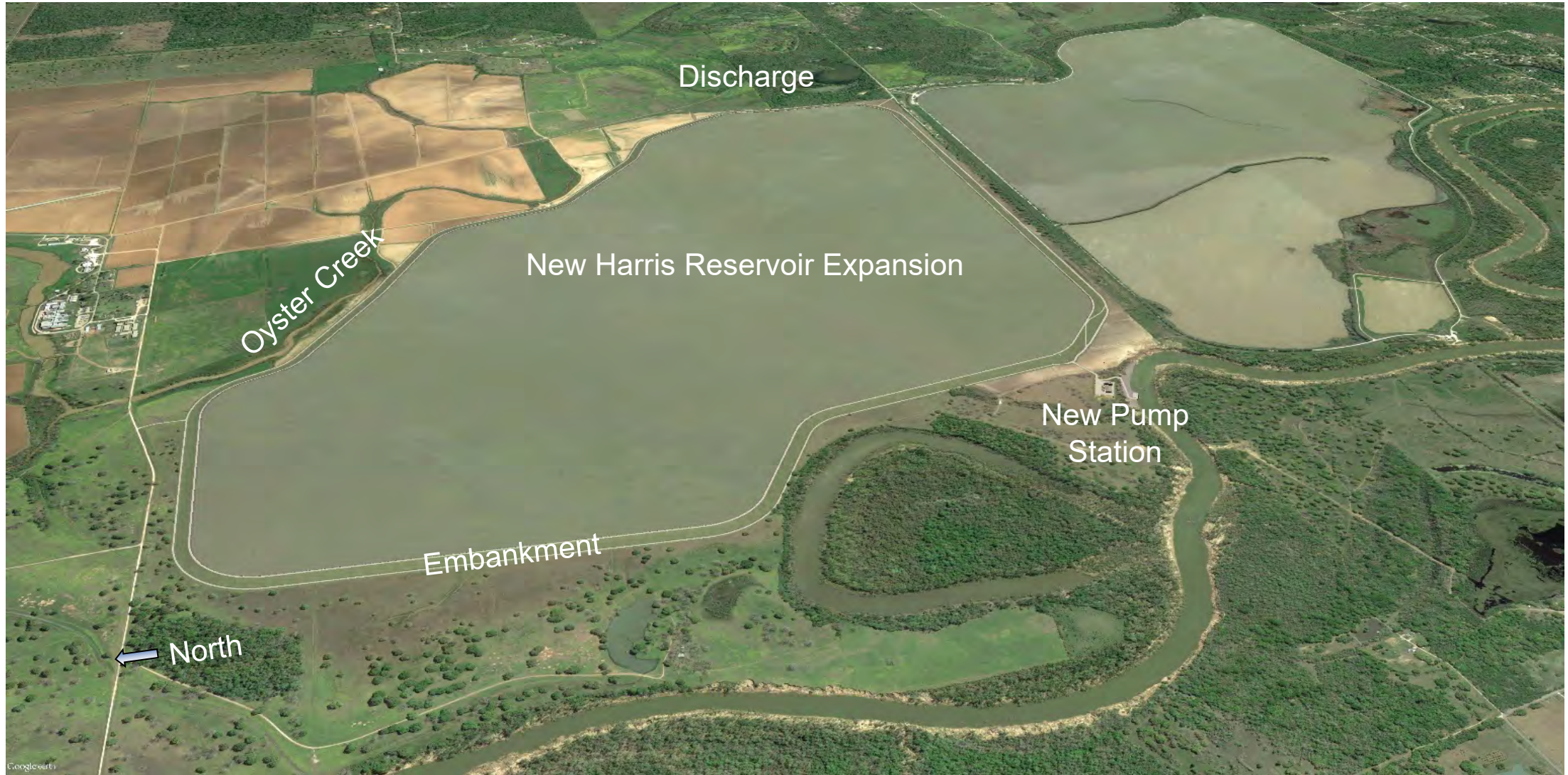
❖ Technology

- Harris Reservoir Expansion will be installed directly north of existing Harris Reservoir
 - Water will siphon into Oyster Creek and follow the same path as the water from the existing Harris Reservoir



Reproduced with permission from Dow.

Technology Being Used



Overall Plot Plan

Technology Being Used – Brazos River Intake

❖ Technology

- Intake screen with mechanical cleaning
 - Compliant with requirements



Side View of Brazos River Intake



Aerial view of Brazos River Intake

Technology Being Used – Pump Station

❖ Technology

- Pump station is based on Brazoria Reservoir pump station
 - Horizontal pumps with assorted foundations, pump house, piping, MCC building, etc.
 - Operations building



Aerial View of Operations Building (L), Pump Station (C), and MCC Building (R)

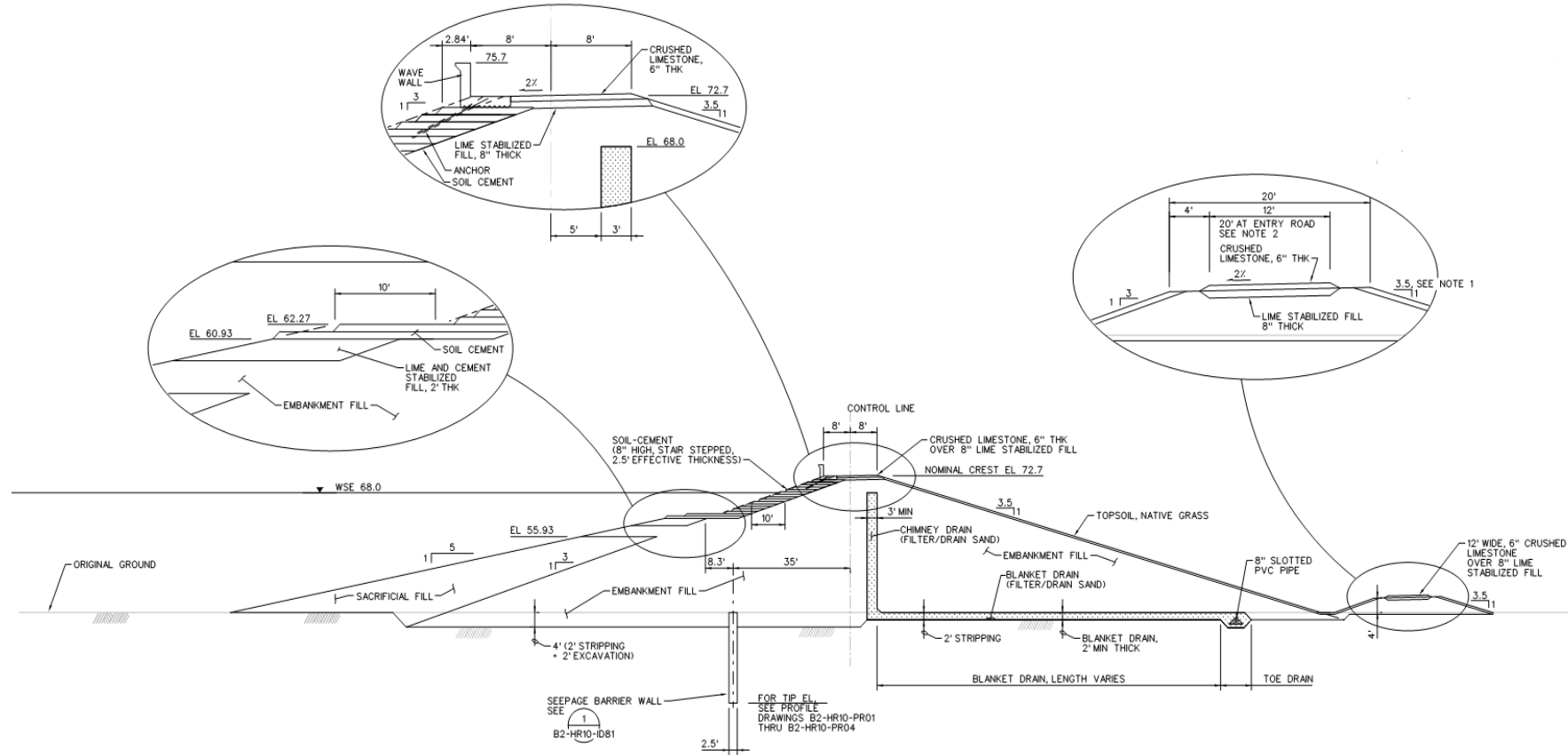


Internal View of Pump House

Technology Being Used - Embankment

❖ Technology (cont.)

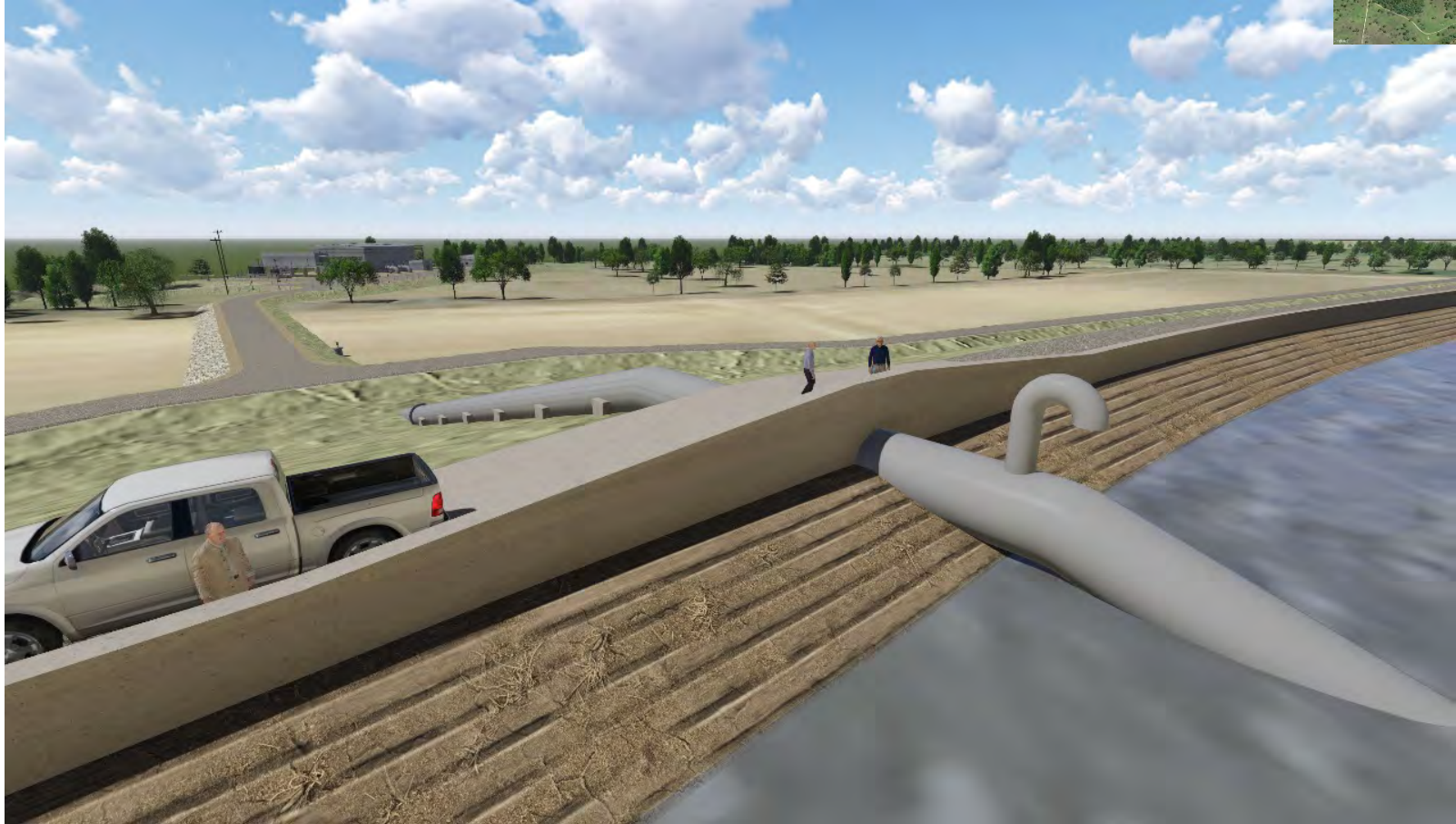
- Design of actual levee around reservoir
 - Review of design with TCEQ Dam Safety Board, other reservoirs, and outside technical review board.



A TYPICAL EMBANKMENT SECTION
1"=15'

Technology – Reservoir Inlet Pipe

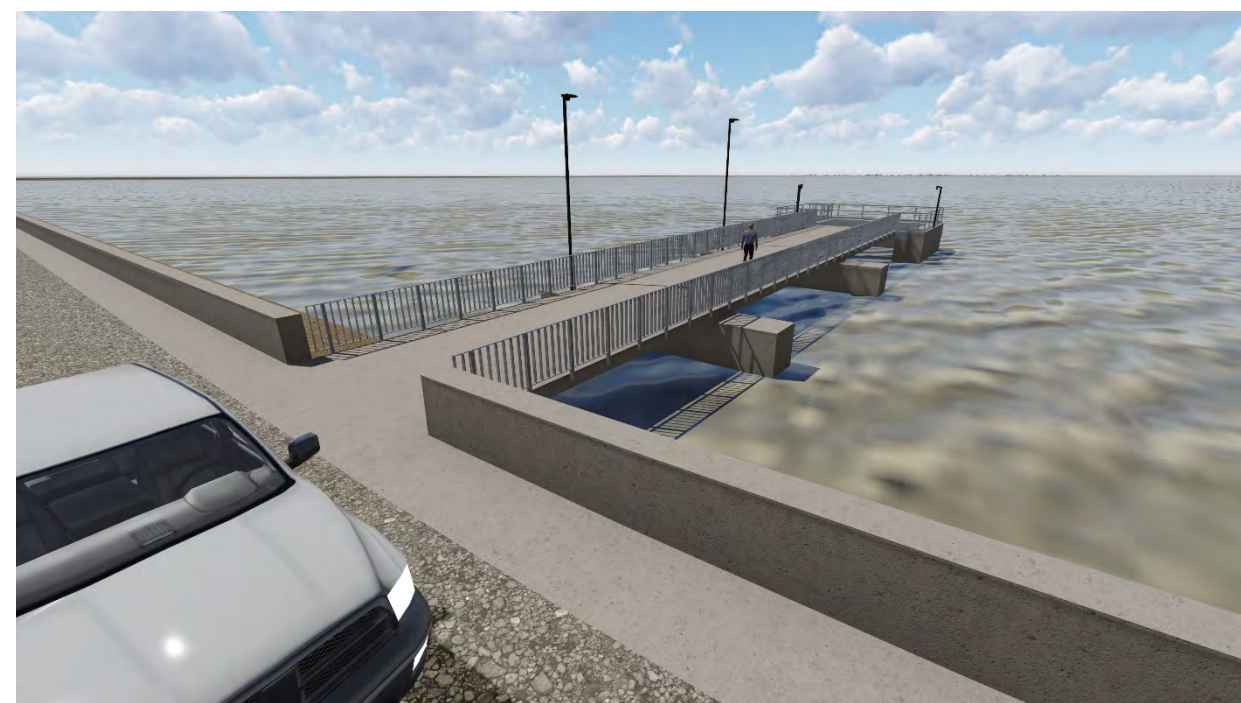
- ❖ Technology
 - Inlet piping with stilling basin in reservoir



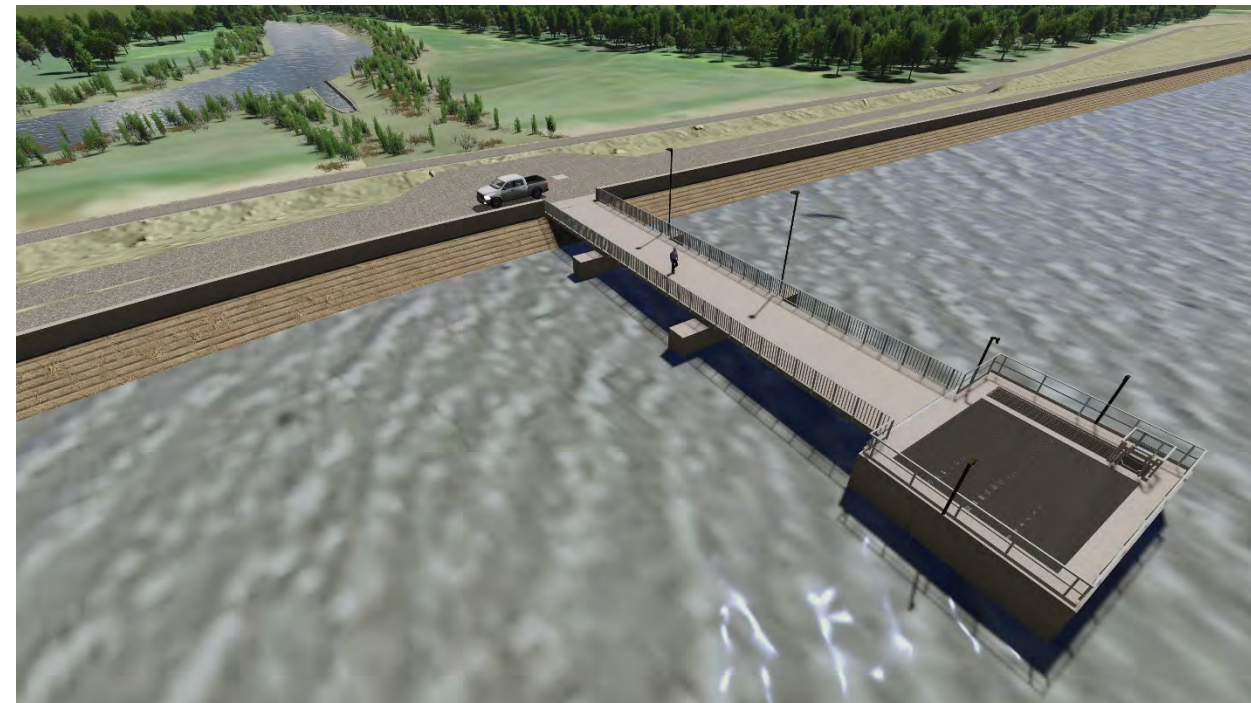
Reservoir inlet piping at crest of reservoir looking southwest with pump station area in background

Technology Being Used – Discharge

- ❖ Technology
 - ❖ Combined emergency outlet/outlet structure



Combined Outlet Structure Looking Towards the Reservoir



Combined Outlet Structure Looking Towards Oyster Creek

Technology Being Used – Flood Plain Mitigation

❖ Technology

- ❖ Flood plain mitigation project #1
 - ❖ Aligns flow of channel with flood plain mitigation requirements
 - ❖ Flood mitigation and stream enhancement design to follow industry best practices
 - ❖ Approximately 2,400 feet of floodplain conveyance and storage improvements
 - ❖ Incorporation of a flood plain bench on both channel banks
 - ❖ Layback of channel banks
 - ❖ Preservation of existing riparian buffer

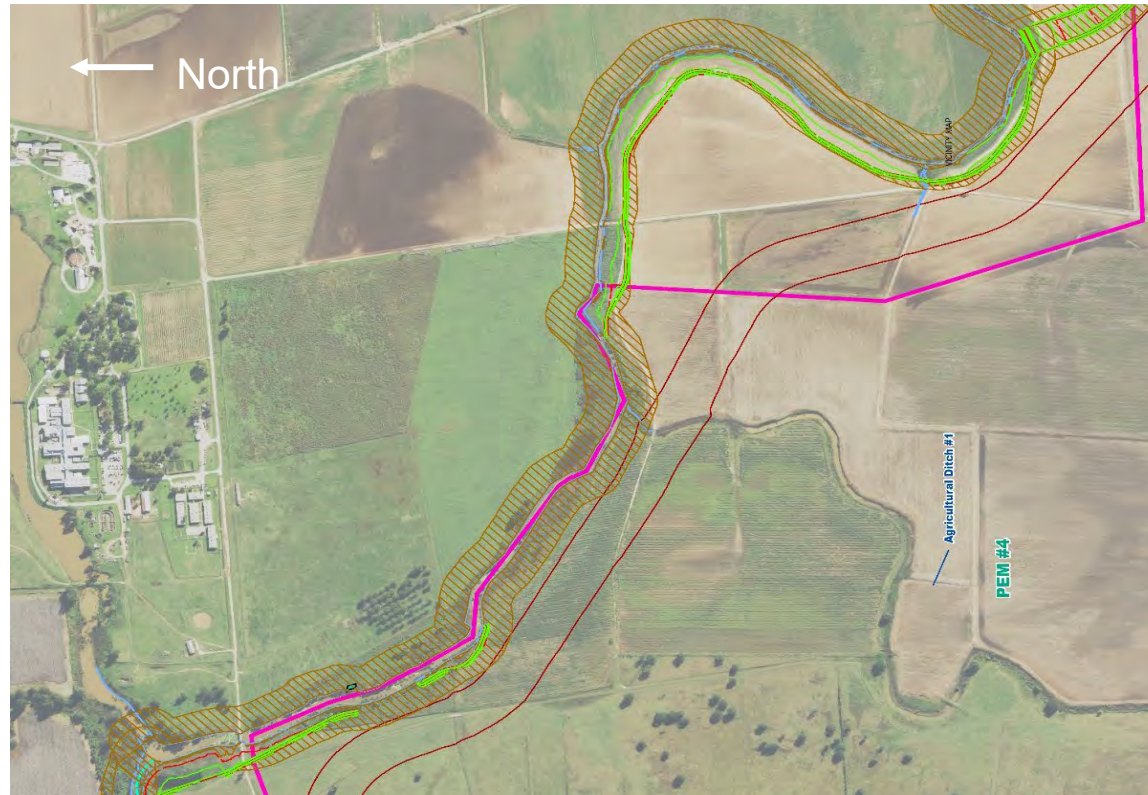


Flood Plain Mitigation Project #1

Technology Being Used – Flood Plain Mitigation

❖ Technology

- ❖ Flood plain mitigation project #2
 - ❖ Aligns flow of channel with flood plain mitigation requirements
 - ❖ Flood mitigation and stream enhancement design to follow industry best practices
 - ❖ Approximately 7,800 feet of floodplain conveyance and storage improvements
 - ❖ Incorporation of a flood plain bench on west channel bank
 - ❖ Preservation of existing riparian buffer
 - ❖ Buffer re-establishment

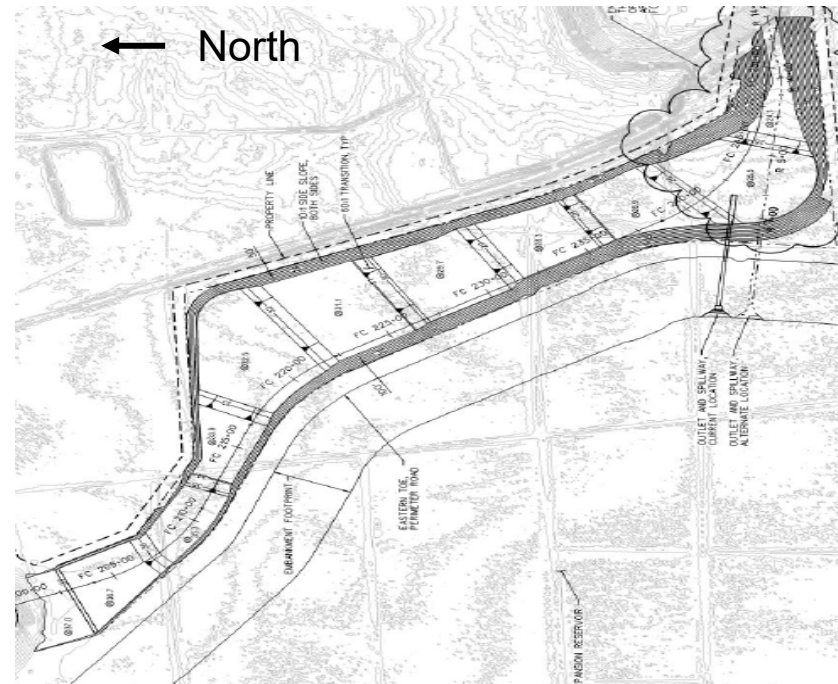


Flood Plain Mitigation Project #2

Technology Being Used – Flood Plain Mitigation

❖ Technology

- ❖ Flood plain mitigation project #3
 - ❖ Aligns flow of channel with flood plain mitigation requirements
 - ❖ Flood mitigation and stream enhancement design to follow industry best practices
 - ❖ Re-establishes an ephemeral channel within the existing floodplain (i.e. channel creation)
 - ❖ Broad crested weir on south bank of Oyster Creek to maintain low flows in Oyster Creek
 - ❖ Conveys overflows from Oyster Creek during high flows (approximately 10-year or greater magnitude flood events)
 - ❖ Will accommodate the reservoir outlet and spillway



Flood Plain Mitigation Project #3

Master Project Schedule (Milestones)

Key Milestone		Comments
FEL3 Project Kickoff	Nov. 2017	
Permit Submittal	Feb. 2018	
Detail Design Kickoff	Jan. 2021	Critical Path
Permit Approval	Apr. 2022	
Start Construction	Aug. 2022	Critical Path
Complete Detail Design	Mar. 2023	
Construction Complete	Aug. 2025	Critical Path
Release to Operations (RTO)	Sept. 2025	Critical Path
Reservoir Filling Complete	Jan. 2026	Critical Path

Appendix D

Scoping Comments

Dow Chemical Company Harris Reservoir Expansion Project

Agency Scoping Meeting Comment Database

Comment #	Commenter (Last Name/First Name)		Commenter Contact Information	Date Received	Category	Comment
1	Blanco	Arturo J.	Environmental Protection Agency Region 6 1201 Elm Street, Suite 500, Dallas, Texas 75270-2102	6/15/2020	Clean Water Act/Wetlands	The EPA recommends the EIS include an evaluation of a full range of alternatives for avoiding and minimizing the impacts to the waters of the U.S. As well as summarizing the criteria used to screen for reasonable alternatives, including the Clean Water Act. The EPA also recommends the Draft EIS identifies aquatic impacts and include a draft mitigation plan to address the need for compensatory mitigation for unavoidable impacts to aquatic resources. Differentiation between permanent vs. temporary impacts, and address potential temporal losses. Clearly define the project components along Oyster Creek as project infrastructure or activities intended as compensatory mitigation.
2	Blanco	Arturo J.	Environmental Protection Agency Region 6 1201 Elm Street, Suite 500, Dallas, Texas 75270-2102	6/15/2020	Air Quality	Recommends the adoption of a Construction Emissions Mitigation Plan in the Record of Decision to reduce potential short-term air quality impacts. EPA recommends the following to be considered for inclusion in the plan to reduce pollutants from construction-related activities: fugitive dust source controls, mobile/stationary source controls, and administrative controls
3	Blanco	Arturo J.	Environmental Protection Agency Region 6 1201 Elm Street, Suite 500, Dallas, Texas 75270-2102	6/15/2020	Socioeconomics/Land Use/Recreation/EJ	Recommends identifying and consulting with tribal governments affected by proposed action and address issues/concerns raised. Allow enough time for tribal governments to participate in consultation and coordination due to COVID-19 impacts.
4	Blanco	Arturo J.	Environmental Protection Agency Region 6 1201 Elm Street, Suite 500, Dallas, Texas 75270-2102	6/15/2020	Socioeconomics/Land Use/Recreation/EJ	An evaluation of environmental justice populations near the geographic scope of the project should be conducted. If EJ populations exist create a comprehensive communication strategy to inform the communities and encourage their participation. Recommends utilizing the Promising Practice Report for considering and analyzing EJ populations.
5	Wolfe	Mark	Texas Historical Commission Jeff.Durst@thc.texas.gov	6/16/2020	Public Involvement	THC acknowledges receipt of notification of public scoping meeting regarding the Harris Reservoir Expansion Project.
6	Galindo	David	Texas Commission on Environment Quality (TCEQ)	7/2/2020	Clean Water Act/Wetlands	The EIS should include appropriate functional assessments performed on streams and wetlands to be impacted by the construction and operation of the reservoir. This should include areas affected by inundation as well as areas downstream of the proposed dam affected by changes in flow regime including Oyster Creek.
7	Galindo	David	Texas Commission on Environment Quality (TCEQ)	7/2/2020	Mitigation	The EIS should clearly account for losses of stream and wetland function due to direct fill impacts, as well as secondary impacts. Stream impacts should be provided in linear feet and distinguished by stream type. Impacts to aquatic resources should be mitigated in-kind.
8	Galindo	David	Texas Commission on Environment Quality (TCEQ)	7/2/2020	Mitigation	The EIS should include the name of the mitigation bank(s) that will be used, the number and resource type of credits to be secured, the availability of credits, and how the number and resource type of credits were determined.
9	Galindo	David	Texas Commission on Environment Quality (TCEQ)	7/2/2020	Mitigation	The EIS should explain the need for cutting a 4:1 slope on Oyster Creek and how this mitigates for impacts to streams impacted by the project. Widening or channelization of Oyster Creek can negatively affect stream function. This may be considered a stream impact rather than mitigation and may require mitigation to replace the lost functions in the channelized areas.
10	Galindo	David	Texas Commission on Environment Quality (TCEQ)	7/2/2020	Mitigation	The proposed mitigation may be insufficient to compensate for impacts to streams and wetlands. Based on the Galveston Stream Tool guidance, the impact factor for the impacted streams due to the reservoir should be higher than the proposed score of 1. Most or all the stream functions will be lost due to the reservoir. Based on the Reach Condition Index (RCI) score, it is likely that the impact factor score should be a 4 or 5. The EIS should revise the impact factor scores and required mitigation credits or explain in detail how the mitigation is sufficient.
11	Galindo	David	Texas Commission on Environment Quality (TCEQ)	7/2/2020	Water Quality/Sedimentation	The EIS should address all measures that will be taken to maintain water quality during and after reservoir construction.

Dow Chemical Company Harris Reservoir Expansion Project Agency Scoping Meeting Comment Database

Comment #	Commenter (Last Name/First Name)		Commenter Contact Information	Date Received	Category	Comment
12	Galindo	David	Texas Commission on Environment Quality (TCEQ)	7/2/2020	Water Quality/Sedimentation	The EIS should address potential water quality impacts such as impacts due to changes in sediment transport downstream of the reservoir.
13	Ardizzone	Charles	United States Department of the Interior FISH AND WILDLIFE SERVICE Coastal Ecological Services Field Office 17629 El Camino Real, Suite 211 Houston, Texas 77058 281-286-8282	7/2/2020	Public Involvement	Requested all the updated reports concerning potential impacts to floodplains and hydrology In response to concerns regarding potential impacts to floodplains and hydrology, the Corps conducted several studies including a geomorphic assessment of Oyster Creek; a Level I and II stream assessment; a hydrology and hydraulic modeling report; modeling of areas downstream to confirm the floodplain storage; an updated interim hydrogeomorphic functional assessment to determine capacities of the waters of the U.S.; and, a Phase I Environmental Site Assessment1. As a cooperating agency, we request all updated reports be provided to our office for a thorough project review and comment. Concerns related to these potential impacts may include, but are not limited to: increase in flooding within the floodplain of the Brazos River and Oyster Creek; mitigation needs to offset impacts to the floodplain, loss or conversion of riparian habitat, and bottomland forested areas; and, impacts to water quality and quantity as it relates to our federally-listed and candidate species and migratory birds.
14	Ardizzone	Charles	United States Department of the Interior FISH AND WILDLIFE SERVICE Coastal Ecological Services Field Office 17629 El Camino Real, Suite 211 Houston, Texas 77058 281-286-8282	7/2/2020	Water Quality/Sedimentation	The Service is concerned with the clearing of the riparian zone where the pump/in-take station is proposed to be constructed on the Brazos River bank. The removal of the riparian zone along the banks of streams and rivers increases the risk and rate of erosion significantly causing water quality issues and habitat degradation. Impacts to this riparian zone can also alter flooding regimes and alter sensitive bottomland forested areas of habitat. The applicant should avoid and/or minimize impacts to riparian habitats to the maximum extent practical in the design of this Project, including any laydown and staging areas. We recommend implementing best management practices (attached) to minimize potential effects to the Brazos River, Oyster Creek, and their associated riparian zones and its delicate ecosystems.
15	Ardizzone	Charles	United States Department of the Interior FISH AND WILDLIFE SERVICE Coastal Ecological Services Field Office 17629 El Camino Real, Suite 211 Houston, Texas 77058 281-286-8282	7/2/2020	Mitigation	The proposed Project proposes to impact 12.19 acres of emergent wetlands, 4.15 acres of forested wetlands, and 20,486.3 linear feet (5.73 acres) of streams. Since the issuance of the public notice in 2018, both a functional and stream assessments were conducted in September 2019. The Corps verified the wetland delineation in October 2019 and plans to revise the conceptual mitigation plan based on these assessments. The applicant should develop a detailed stream mitigation plan pursuant to the requirements of 33 CFR 332.4 (c). We request that the Corps provide this plan to the Service and other resource agencies for review and comment prior to the issuance of this permit.
16	Ardizzone	Charles	United States Department of the Interior FISH AND WILDLIFE SERVICE Coastal Ecological Services Field Office 17629 El Camino Real, Suite 211 Houston, Texas 77058 281-286-8282	7/2/2020	Clean Water Act/Wetlands	We are concerned with temporal loss of forested wetland functions and values posed by the Project. Stream restoration and enhancement will likely require years to stabilize, become functional, and grow mature riparian zones. Loss of habitat for multiple generations could destabilize local populations of species with short life cycles (e.g. amphibians, birds, etc.). The applicant should conduct long-term monitoring of mitigation sites in order to capture the streams' timeframe of recovery, and as such, these details should be detailed in the mitigation planning documents.
17	Ardizzone	Charles	United States Department of the Interior FISH AND WILDLIFE SERVICE Coastal Ecological Services Field Office 17629 El Camino Real, Suite 211 Houston, Texas 77058 281-286-8282	7/2/2020	Vegetation/Wildlife Habitat	A plan that includes post-construction site restoration and management activities should be developed and provided to the Service for review and comment. Such a plan should address potential management strategies (i.e. mowing, herbicide use, plantings): ways to avoid/minimize the introduction of nonnative aquatic and plant species into the ecosystem; and, address measures to avoid and/or minimize impacts of such activities to our trust resources (e.g. federally-listed and candidate species, migratory birds, aquatic resources).

Dow Chemical Company Harris Reservoir Expansion Project Agency Scoping Meeting Comment Database

Comment #	Commenter (Last Name/First Name)		Commenter Contact Information	Date Received	Category	Comment
18	Ardizzone	Charles	United States Department of the Interior FISH AND WILDLIFE SERVICE Coastal Ecological Services Field Office 17629 El Camino Real, Suite 211 Houston, Texas 77058 281-286-8282	7/2/2020	Threatened and Endangered Species	The applicant should conduct baseline and post-restoration assessments of macroinvertebrate (e.g. mussels), fish, and riparian zones within areas of the Project and the proposed in-stream mitigation sites. The Texas fawnsfoot (<i>Truncilla macrodon</i>) can potentially occur within the Colorado and Brazos River drainages. The species is currently a candidate and is under review by the Service to determine if protection under the Act is warranted.
19	Ardizzone	Charles	United States Department of the Interior FISH AND WILDLIFE SERVICE Coastal Ecological Services Field Office 17629 El Camino Real, Suite 211 Houston, Texas 77058 281-286-8282	7/2/2020	Vegetation/Wildlife Habitat	Per prior guidance, post-construction bank restoration strategies should strive to obtain a minimum surviving density of 400 stems/acre of trees and shrubs planted by year 3. Of those, 250 stems/acre should be six feet tall by year 7. As the stand matures and the canopy closes, light will be limited and competition will increase. This will lead to a decrease in population densities to between 100 and 250 stems/acre and producing, in concert with forest management strategies, a sustainable and productive community of native tree species.
20	Ardizzone	Charles	United States Department of the Interior FISH AND WILDLIFE SERVICE Coastal Ecological Services Field Office 17629 El Camino Real, Suite 211 Houston, Texas 77058 281-286-8282	7/2/2020	Clean Water Act/Wetlands	Recommended several best management practices to implement as the project has the potential to effect river, stream or tributary aquatic habits. In addition to these recommendations, the commenter suggested the project considers SMZ widths (chart provided) and additional permit requirements for fill materials and additional individual projects.
21	Geeslin	Dakus	Texas Parks & Wildlife 4200 Smith School Road Austin, TX 78744-3291 512-389-4800	7/2/2020	Vegetation/Wildlife Habitat	Texas Parks and Wildlife Department is concerned with potential impacts to environmentally critical habitats including wetlands, streams, coastal prairie, neotropical songbird nesting and foraging areas, and federal/state threatened and endangered species habitat. TPWD recommends the EIS include detailed descriptions and evaluations for all associated phases of the project relative to the items discussed in Attachment A and Attachment B.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270-2102

June 15, 2020

Mr. Jayson Hudson
U.S. Army Corps of Engineers
Galveston District, Regulatory Division
P.O. Box 1229
Galveston, TX 77553-1229

Dear Mr. Hudson:

The Region 6 office of the U.S. Environmental Protection Agency (EPA) has reviewed the U.S. Army Corps of Engineers – Galveston District (USACE) Scoping request to solicit input regarding the impacts associated with the proposed Harris Reservoir Expansion project and Draft Environmental Impact Statement (EIS).

To assist in the scoping process, we have identified the following areas for your attention in the preparation of USACE EIS:

Clean Water Act 404/Wetlands

It is recommended the EIS include an evaluation of a full range of alternatives with the goal of avoiding and minimizing the impacts to waters of the U.S. while meeting the purpose and need of the proposed action. It is important that the EIS summarizes criteria used to screen reasonable alternatives, including the Clean Water Act (CWA) regulatory criteria used to develop practicable alternatives, and consideration be given to environmental, logistical, technological and cost criteria. Providing the rationale and criteria used to eliminate alternatives is helpful in understanding the decision process. Any selected or preferred alternative should be consistent with CWA 404(b)(1) Guidelines, and demonstrate that such alternative is the least environmentally damaging practicable alternative.

It is also recommended the Draft EIS identify aquatic impacts and include a draft mitigation plan that addresses the need for compensatory mitigation for unavoidable impacts to aquatic resources. The project components along Oyster Creek should be clearly defined as project infrastructure or activities intended as compensatory mitigation to ensure sufficient in-kind mitigation is provided. In addition to quantity and quality of aquatic resources, permanent versus temporary impacts should be differentiated and potential temporal losses should be addressed.

Air Quality

EPA recommends that in order to reduce potential short-term air quality impacts associated with construction activities, the agencies responsible for the project should include a Construction Emissions Mitigation Plan, and adopt this plan in the Record of Decision (ROD). In addition to conducting construction and waste disposal activities in accordance with all applicable local, state, or federal requirements, the EPA recommends that fugitive dust source controls (e.g. stabilization of disturbed soils), mobile/stationary source controls (e.g. limitation of vehicle idling, maintenance of engines to

perform at EPA certification levels), and administrative controls (e.g. traffic/parking management plan to maintain traffic flow) be considered for inclusion (as applicable and practicable) in the Construction Emissions Mitigation Plan in order to reduce impacts associated with emissions of NOx, CO, PM, SO2, and other pollutants from construction-related activities.

Environmental Justice and Tribal Consultation

EPA recommends USACE identify and consult with tribal governments affected by the proposed action and address any issues and/or concerns raised. Due to COVID-19 impacts, please allow enough time for tribal governments to participate in consultation and coordination.

The USACE should conduct an evaluation of environmental justice (EJ) populations near the geographic scope of the project. If such populations exist, the potential for disproportionate adverse impacts to minority and low-income populations should be discussed along with the approaches used to foster public participation by these populations. There should be a comprehensive communication strategy to inform EJ communities and encourage participation. Finally, EPA recommends that USACE utilize the Promising Practice Report to supplement the applicable requirements for considering and analyzing EJ populations, which can be found at the following link: https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

We appreciate the opportunity to provide scoping comments on the Harris Reservoir Expansion project. We look forward to reviewing the EIS documents related to this effort. The staff contact for the review is Keith Hayden and he can be reached at 214-665-2133 or by e-mail at hayden.keith@epa.gov.

Sincerely,

Arturo J. Blanco
Director
Office of Communities, Tribes and
Environmental Assessment

From: noreply@thc.state.tx.us
To: [SWG201601027; reviews@thc.state.tx.us](mailto:SWG201601027_reviews@thc.state.tx.us)
Subject: [Non-DoD Source] Project Review: 202013700
Date: Tuesday, June 16, 2020 4:12:40 PM

<Blockedhttp://www.thc.state.tx.us/public/upload/image/THC.png>

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
THC Tracking #202013700
Harris Reservoir Expansion Project

Dear Client:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff led by Jeff Durst has completed its review and has made the following determinations based on the information submitted for review:

We have the following comments: THC acknowledges receipt of notification of public scoping meeting regarding the Harris Reservoir Expansion Project.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Jeff.Durst@thc.texas.gov

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit [Blockedhttp://thc.texas.gov/etrac-system](http://thc.texas.gov/etrac-system).

Sincerely,

<Blockedhttp://www.thc.texas.gov/public/upload/images/reviewerSignatures/73.png>

For Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 2, 2020

Mr. Jayson Hudson, Project Manager
Galveston District CESWG-PE-RE
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Re: USACE Permit Application No. SWG-2016-01027

Dear Mr. Hudson:

As described in the Joint Public Notice for the Harris Ridge Reservoir Expansion Project Environmental Impact Statement (EIS) and Scoping Announcement dated May 27, 2020, the U. S. Army Corps of Engineers (USACE) announced the preparation of an EIS to analyze potential impacts associated with the construction and operation of the Harris Reservoir Expansion Project proposed by the Dow Chemical Company (Dow).

The proposed project would include the construction of a 1,929-acre impoundment with a nominal storage capacity of 50,000 acre-feet, an intake and pump station to divert Dow's existing surface water rights from the Brazos River, an outlet to Oyster Creek, and an emergency spillway. The Project would also include floodplain enhancements on Oyster Creek, stream restoration, and temporary construction staging and laydown areas. The project is adjacent to the existing Dow Chemical Harris Reservoir in Angleton, Brazoria County, Texas.

The Texas Commission on Environmental Quality (TCEQ) appreciates the opportunity to comment on the scope of the EIS and has the following comments and recommendations.

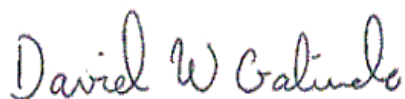
1. The EIS should include appropriate functional assessments performed on streams and wetlands to be impacted by the construction and operation of the reservoir. This should include areas affected by inundation as well as areas downstream of the proposed dam affected by changes in flow regime including Oyster Creek.
2. The EIS should clearly account for losses of stream and wetland function due to direct fill impacts, as well as secondary impacts. Stream impacts should be provided in linear feet and distinguished by stream type. Impacts to aquatic resources should be mitigated in-kind.
3. The EIS should include the name of the mitigation bank(s) that will be used, the number and resource type of credits to be secured, the availability of credits, and how the number and resource type of credits were determined.

Mr. Jayson Hudson, Project Manager
Page 2
July 1, 2020

4. The EIS should explain the need for cutting a 4:1 slope on Oyster Creek and how this mitigates for impacts to streams impacted by the project. Widening or channelization of Oyster Creek can negatively affect stream function. This may be considered a stream impact rather than mitigation and may require mitigation to replace the lost functions in the channelized areas.
5. The proposed mitigation may be insufficient to compensate for impacts to streams and wetlands. Based on the Galveston Stream Tool guidance, the impact factor for the impacted streams due to the reservoir should be higher than the proposed score of 1. Most or all the stream functions will be lost due to the reservoir. Based on the Reach Condition Index (RCI) score, it is likely that the impact factor score should be a 4 or 5. The EIS should revise the impact factor scores and required mitigation credits or explain in detail how the mitigation is sufficient.
6. The EIS should address all measures that will be taken to maintain water quality during and after reservoir construction.
7. The EIS should address potential water quality impacts such as impacts due to changes in sediment transport downstream of the reservoir.

The TCEQ appreciates the opportunity to comment and looks forward to receiving and evaluating other agency or public comments. Please provide any agency comments, public comments, as well as the applicant's comments, to Ms. Jenna R. Lueg of the Water Quality Division MC-150, P.O. Box 13087, Austin, Texas 78711-3087. Ms. Lueg may also be contacted by e-mail at jenna.lueg@tceq.texas.gov, or by telephone at (512) 239-4590.

Sincerely,



David W. Galindo, Director
Water Quality Division
Texas Commission on Environmental Quality

DWG/JL/fc

cc: Ms. Allison Buchtien via e-mail at Federal.Consistency@GLO.TEXAS.GOV



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Fort Worth

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Wimberley

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Chairman-Emeritus
Fort Worth

T. Dan Friedkin
Chairman-Emeritus
Houston

Carter P. Smith
Executive Director

July 2, 2020

Mr. Jayson Hudson
USACE Galveston District
Regulatory Branch
P.O. Box 1229
Galveston TX 77553-1229

Re: USACE Notice of Intent to Prepare an Environmental Impact Statement and Public Scoping Meeting for DOW Chemical Company's Harris Reservoir Expansion Project, Brazoria County, Texas
Permit Number SWG-2016-01027

Dear Mr. Hudson:

Texas Parks and Wildlife Department (TPWD) is submitting comments and concerns which we request be considered and assessed in the Environmental Impact Statement (EIS) for the proposed DOW Chemical Company Harris Reservoir Expansion Project. The proposed project would include construction of a 1,929-acre impoundment with a nominal storage capacity of 50,000 acre-feet. An intake and pump station would be utilized to divert water from the Brazos River to the reservoir, while an outlet and emergency spillway will be constructed to transfer water from the reservoir to Oyster Creek and then to end users in the Brazosport area. The project also includes proposed floodplain enhancements in Oyster Creek, along with stream restoration, and temporary construction staging and laydown areas. The project site is located between the Brazos River and Oyster Creek, approximately eight miles northwest of the City of Angleton, and abuts the Brazos River in Brazoria County, Texas.

On March 2, 2018 the U. S. Army Corps of Engineers (USACE) placed the permit application for this project on Public Notice (PN) for review and comment. TPWD provided a response to the PN on April 30, 2018. Due to the scope of this project, the USACE determined development of an EIS was necessary and invited TPWD by letter dated November 6, 2018 to participate as a member of an inter-agency work group. By Notice of Intent (NOI) issued April 9, 2020, the USACE publicly announced the intent to prepare an EIS in compliance with the National Environmental Policy Act (NEPA) to render a final decision on the permit application. The EIS will assess the potential social, economic, and environmental impacts of the construction and operation of the proposed project and is intended to be sufficient in scope to address federal, state, and local requirements; environmental and socioeconomic issues concerning the proposed action; and permit reviews.

Under §12.0011 of the Parks and Wildlife (TPW) Code, TPWD is charged with “providing recommendations that will protect fish and wildlife resources to local, state, and federal agencies that approve, permit, license, or construct developmental projects” and “providing information on fish and wildlife resources to any local, state, and federal agencies or private organizations that make decisions affection those resources.”

TPWD has reviewed a description of the proposed project, along with stream and wetland delineation and functional assessment reports, hydrology and floodplain analysis, and a conceptual mitigation plan furnished by the applicant in 2018. TPWD is concerned with potential impacts to environmentally critical habitats including wetlands, streams, coastal prairie, neotropical songbird nesting and foraging areas, and federal/state threatened and endangered species habitat. TPWD recommends the EIS include detailed descriptions and evaluations for all associated phases of the project relative to the items discussed in Attachment A and Attachment B.

TPWD appreciates the opportunity to contribute scoping comments for this NOI. Prior to issuance of a Final EIS, TPWD recommends that the U.S. Army Corps of Engineers coordinate closely with TPWD and other resource agencies to address concerns.

Questions can be directed to Ms. Colleen Roco of the Upper Coast Ecosystem Resources Program at (281) 534-0139 or Colleen.Roco@tpwd.texas.gov or to Rachel Lange of the Wildlife Habitat Assessment Program at (979) 732-4213 or Rachel.Lange@tpwd.texas.gov.

Sincerely,



Dakus Geeslin
Chief, Science and Policy Resources Branch
Coastal Fisheries Division

LK:CSR

Attachment A
SWG-2016-010207

TPWD recommends that the Environmental Impact Statement includes detailed descriptions, assessments, and evaluations for all associated phases of the project relative to the following:

- Potential hydrologic changes in the base flow regime and sediment deposition patterns associated with water withdrawal from the Brazos River.
- Potential impacts to aquatic/estuarine organisms and aquatic/estuarine habitats in the Brazos River and Brazos River estuary due to hydrologic changes associated with water withdrawal from the Brazos River (i.e. lower in-stream flows, reduced freshwater inflow, shifts in salinity gradients).
- Potential hydrologic changes in the base flow regime, sediment deposition patterns, and bank erosion potential due to the addition of water to Oyster Creek.
- Potential impacts to aquatic/estuarine organisms and aquatic/estuarine habitats in Oyster Creek, Buffalo Camp Bayou, and associated tidally-influenced waterbodies due to hydrologic changes associated with water transfer from the Brazos River (i.e. higher in-stream flows, increased freshwater inflow, shifts in salinity gradients, turbidity).
- Potential impacts to water quality in Oyster Creek, a stream that is on the Section 303(d) impaired water body list for elevated bacteria and depressed dissolved oxygen just downstream from the proposed project site. (H-GAC 2016).
- Potential to cause increased flooding along Oyster Creek downstream of the project site due to the severing of a distributary channel between the creek and Brazos River, removal of 1,929 acres from the 100-year floodplain, and the potential emergency discharge of water from the reservoir due to extreme weather events.
- Potential to cause increased flooding along the Brazos River downstream of the project site during extreme flooding events due to removal of 1,929 acres from the 500-year floodplain (note Google Earth aerial imagery dated 08/2017).
- Provide a comprehensive hydrological analysis of any associated flood control project that may be necessary to mitigate for impacts to the floodplain.
- Potential direct and secondary impacts to riparian habitat and bottomland forested areas along the Brazos River and Oyster Creek due to altered flooding hydrology resulting from interbasin transfer of water and removal of land from the floodplains. (Note that

freshwater wetlands and Columbia Bottomlands are identified as priority habitats in the 2012 TPWD Texas Conservation Action Plan.)

- Potential magnitude of impacts to egg, larval, and adult stages of fish and other aquatic organisms due to impingement, entrainment, and movement of water associated with all project design components.
- Assess the potential introduction of non-native invasive aquatic organisms and/or plants into the Oyster Creek watershed via the proposed project and evaluate mechanisms that can be implemented to prevent their transfer.
- Assess the potential impacts to migratory or nesting avian species due to disturbance, machinery use, or destruction of habitat during and following construction of the proposed project.
- Potential impacts to all federal and state-listed rare, threatened, and endangered species and their habitat and evaluate mechanisms that can be implemented to prevent or attenuate impacts. (See Attachment B of Recommendations from TPWD Wildlife Division, Habitat Assessment Program.)
- Potential impacts to native freshwater mussels and their habitats in the Brazos River, Oyster Creek and any tributary streams of those waterbodies.
- Provide detailed plans of the intake structure and construction methods, including any plans to dewater an area within a cofferdam.
- Formulate and provide TPWD with an Aquatic Resources Relocation Plan for all organisms in any waterbody that will be dewatered or destroyed.
- Assess the necessity of obtaining a Sand and Gravel Permit from TPWD for proposed disturbance to the Brazos River and Oyster Creek streambeds.
- Provide wetland delineation data, Level I Stream Assessment data, and detailed iHGM and stream assessment calculations.
- Assess all stream and wetland impacts at the project site and provide compensatory mitigation for all special aquatic sites.
- Provide detailed PRM plans for stream mitigation demonstrating hydraulic assessment, geomorphic assessment, and natural channel design (Rosgen 1996). Include detailed species lists for all proposed riparian buffer plantings and a monitoring plan that spans 10 years for evaluation of stream function and 15 years for evaluation of establishment of forested riparian buffers.

Attachment A
SWG-2016-01027 Scoping Comments

References:

Houston-Galveston Area Council (HGAC). 2016. Basin Summary Report, Oyster Creek Above-Tidal, Segment 1110. Accessed from:

http://www.bsr2016.com/watershedsummaries/documents/1110_Oyster%20Creek%20Above%20Tidal.pdf

Rosgen, D. 1996. Applied river morphology. Wildlife Hydrology. Pagosa Springs, CO.

Attachment B

SWG-2016-010207

TPWD recommends that the Environmental Impact Statement address best management practices and observance of Federal and State regulations to minimize impacts to wildlife and natural resources.

General Construction Recommendations

Recommendation: Where trenching or other excavation is involved in construction TPWD recommends that contractors keep trenching/excavation and backfilling crews close together to minimize the amount of trenches/excavation areas left open at any given time during construction. TPWD recommends that any open trenches or excavation areas be covered overnight and/or inspected every morning to ensure no wildlife species have been trapped. Trenches left open for more than two daylight hours should be inspected for the presence of trapped wildlife prior to backfilling. If trenches/excavation areas cannot be backfilled the day of initial excavation, then escape ramps should be installed at least every 90 meters (approximately 295 feet). Escape ramps can be short lateral trenches or wooden planks sloping to the surface at an angle less than 45 degrees (1:1).

Recommendation: For soil stabilization and/or revegetation of disturbed areas within the proposed project area, TPWD recommends erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. Because the mesh found in many erosion-control blankets or mats pose an entanglement hazard to wildlife, TPWD recommends the use of no-till drilling, hydromulching and/or hydroseeding rather than erosion control blankets or mats due to a reduced risk to wildlife. If erosion control blankets or mats will be used, the product should contain no netting or contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic mesh matting should be avoided.

Recommendation: During construction, operation, and maintenance of the proposed facility, TPWD recommends observing slow (25 miles per hour, or less) speed limits within the project site. Reduced speed limits would allow personnel to see wildlife in the vehicle path and avoid harming them.

Recommendation: TPWD recommends providing contractor training on avoiding impacts to rare and protected species. Because a biological monitor cannot oversee all construction activity at the same time, it's important for the construction personnel to be able to identify protected species and to be on the lookout for them during construction.

Federal Laws

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits direct and affirmative purposeful action that reduce migratory birds, their eggs, or their nests, by killing or capturing, to human control, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The U.S. Fish and Wildlife Service (USFWS) Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

Within the project area, potential impacts to migratory birds may occur during site preparation and grading activities through the disturbance of existing vegetation and bare ground that may harbor active bird nests, including nests that may occur in grass, shrubs and trees and on bare ground.

Recommendation: TPWD recommends any vegetation clearing be scheduled outside of the general bird nesting season of March 15th to September 15th; however, if clearing must occur during nesting season, nest surveys should be conducted prior to clearing. Nest surveys should take place within 5 days of scheduled clearing in order to maximize the detection of active nests. If nests are observed during surveys, a vegetation buffer area of no less than 150-feet in diameter should remain around the nest until all young have fledged.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), including their parts, nests, or eggs. The BGEPA provides criminal penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof.” The BGEPA defines "take" as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.

Recommendation: When potential impacts to the bald eagle are anticipated, TPWD recommends consultation with USFWS – Clear Lake Ecological Services at (281) 286-8282 regarding compliance with the BGEPA.

Endangered Species Act

Federally-listed animal species and their habitat are protected from take on any property by the Endangered Species Act (ESA). Take of a federally-listed species can be allowed if it is incidental to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Any take of a federally-listed species or its habitat without the required take permit (or allowance) from the USFWS is a violation of the ESA.

Based on the information provided, it appears that the project could negatively impact the black rail (*Laterallus jamaicensis*, proposed threatened). This species is also listed as state-threatened in Texas.

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Recommendation: The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for federally listed species. For the USFWS rare species lists by county please visit the USFWS Information for Planning and Consultation (IPaC) webpage.

State Laws

Parks and Wildlife Code – Chapter 64, Birds

Texas Parks and Wildlife (TPW) Code Section 64.002, regarding protection of nongame birds, provides that no person may catch, kill, injure, pursue, or possess a bird that is not a game bird. TPW Code Section 64.003, regarding destroying nests or eggs, provides that no person may destroy or take the nests, eggs, or young and any wild game bird, wild bird, or wild fowl. TPW Code Chapter 64 does not allow for incidental take and; therefore, is more restrictive than the MBTA.

Recommendation: Please review the *Federal Law: Migratory Bird Treaty Act* section above for recommendations as they are also applicable for Chapter 64 of the TPW Code compliance.

Parks and Wildlife Code, Section 68.015

TPW Code regulates state-listed threatened and endangered animal species. The capture, trap, take, or killing of state-listed threatened and endangered animal species is unlawful unless expressly authorized under a permit issued by USFWS or TPWD. A copy of TPWD Protection of State-Listed Species Guidelines, which includes a list of penalties for take of species, can be found online at the TPWD Wildlife Habitat Assessment Program: Laws and Regulations Applicable to TPWD Review webpage. For purposes of relocation, surveys, monitoring, and research, State-listed species may only be handled by persons with the appropriate authorization obtained through the TPWD Wildlife Permits Program. For more information on this authorization, please contact the Wildlife Permits Office at (512) 389-4647.

TPWD provides online access to state-listed species information through the TPWD Rare, Threatened, and Endangered Species of Texas by County (RTEST) application. This application provides county-level information regarding occurrence of protected species (federal- or state-listed threatened or endangered) and may be utilized to inform development project planning. Additionally, records of occurrence for these protected species are tracked within the Texas Natural Diversity Database (TXNDD) and are publicly available by request. In reviewing these data sources, aerial imagery, and project documents, TPWD has determined the project area appears to provide suitable habitat for multiple state-listed species, such as the following species:

- reddish egret (*Egretta rufescens*)
- white-faced ibis (*Plegadis chihi*)
- white-tailed hawk (*Buteo albicaudatus*)
- wood stork (*Mycteria americana*)
- Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)
- alligator snapping turtle (*Macrochelys temminckii*)
- Texas fawnsfoot (*Truncilla macrodon*)

Birds

The reddish egret is a year-round resident within Texas, inhabiting marshes, shallow salt ponds, and tidal flats. The species may occur inland on rare occasions. Reddish egrets nest communally with other species of wading birds. Nests are constructed on the ground or in trees/bushes, often in the thickets of coastal islands.

The white-faced ibis inhabits marshes, swamps, ponds, and rivers. Freshwater systems are preferred. Isolated nesting colonies have been documented from Oregon to Kansas, but white-faced ibis are more commonly found in Utah, Texas, and Louisiana. In Texas, this species breeds and winters along the Gulf Coast; migrants may occur in the Texas panhandle and west Texas. The white-faced ibis is a colonial nesting species and will construct nests in beds of bulrushes, mats formed by dead vegetation, or trees. Nesting and hatching occurs in late spring through early summer. Colonial wading bird rookeries are documented in the project study area.

White-tailed hawks inhabit disjunct breeding areas from southern Texas to Argentina; in the United States, the species' range is restricted to Texas where it occurs year-round. Habitats utilized by this species include prairies, savannah, thornscrub, and woodland. Low trees and shrubs are utilized for nesting, and nests will be used more than once. White-tailed hawks eat a variety of prey items, and both sexes bring food to young.

The wood stork is associated with various habitats featuring shallow, standing water, such as prairie ponds, ditches, mudflats, flooded fields, and natural wetlands. This species will utilize both freshwater and saltwater systems, located in either open or forested areas. The wood stork roosts communally in snags, sometimes in association with other species of wading birds (e.g., herons). Colonial wading bird rookeries are documented in the project study area.

Rookeries

In general, nesting dates for herons and egrets range from early-February to late-August in Texas, depending on the species. Great blue herons (*Ardea herodias*) are usually the first to nest. If nesting great blue herons are disrupted and abandon nesting, other species of herons and egrets may not attempt to nest at the rookery that year. A reference that indicates nesting dates for Texas species within rookeries can be found in the TPWD publication, *Nuisance Heronries in Texas*.

Recommendation: TPWD recommends a qualified biologist survey the selected alternative route corridor for rookeries prior to construction. If rookeries are encountered, TPWD recommends avoiding/minimizing disturbance during nesting. TPWD recommends a primary buffer area of 300 meters (984 feet) from the rookery periphery. TPWD recommends avoiding any vegetation clearing within this buffer area as a protection measure to protect the rookery species and their habitat. TPWD recommends a secondary buffer area of 1,000 meters (3,281 feet) from the rookery periphery to avoid clearing activities or construction using heavy machinery during the breeding season (courting and nesting). Construction and permanent easements that would encroach within this buffer area should be adjusted or narrowed to avoid clearing within this buffer area. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, human foot traffic or machinery use should not occur within this buffer area during the nesting season.

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Recommendation: If rookeries are identified in the project area and details regarding the rookeries are provided, TPWD staff can discuss the ability to feasibly meet the recommended setback distances. Details to aid in decision making includes the size of the rookery (number of nests and area of rookery), species utilizing the rookery, distance of rookery periphery from the construction area, and characteristics regarding the habitat within and surrounding the rookery.

Recommendation: TPWD recommends avoiding disturbance to habitats required by the above-listed birds. If disturbance of these habitats is anticipated, the applicant should coordinate with TPWD to determine avoidance, minimization, and mitigation strategies.

Mammals

The Rafinesque's big-eared bat is a cavity roosting bat species that is also known to utilize buildings and other infrastructure, like culverts, water wells, and bridges. Another important component of suitable habitat for the bats is a source of fresh drinking water, such as lakes, ponds, or streams. Rafinesque's big-eared bat is a non-migratory species and remains active nearly year-round in the southern part of its range. Within areas of suitable habitat, this species will segregate into bachelor and maternity colonies. Maternity colonies are established in late spring, and normally disband by October.

Recommendation: TPWD recommends avoiding disturbance of roost sites that may provide habitat for Rafinesque's big-eared bat. Where suitable roosts occur, TPWD recommends any necessary clearing occur outside of the young-rearing period of approximately May – October. Young bats cannot fly (nonvolant) for three weeks after parturition; thus, young bats are unable to escape and avoid habitat or roost impacts, such as those caused by the clearing of roost trees.

Reptiles

The alligator snapping turtle is the largest freshwater turtle in North America and inhabits both lentic and lotic systems within the southeastern United States. Perennial water is required by the alligator snapping turtle and this species is most often found within the deep-water portions of rivers, canals, oxbows, and swamps. Muddy, vegetated bottoms are preferred. Individual turtles are known to make movements of several river-miles. Nesting occurs in the spring, when female turtles will lay a single clutch of eggs on dry land not far from a water source. Nest sites typically include river berms, high banks, and artificial spoil mounds. Hatchling turtles emerge in the late summer.

While alligator snapping turtles can coexist with some degree of channel modification, negative effects of these activities include the removal of important habitat features (e.g., large woody debris), alteration of hydrology, disruption of nesting sites.

Recommendation: TPWD recommends the applicant and its contractors be aware that alligator snapping turtles or common snapping turtles, which are of similar appearance, may be encountered near water resources when they go on land to lay eggs.

Recommendation: TPWD recommends that the river intake and reservoir outlet structures be designed in a way that protects alligator snapping turtles from becoming lodged in or otherwise harmed during operation of the proposed facilities.

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Recommendation: TPWD recommends avoiding disturbance of the waterways within the study area that may be inhabited by the alligator snapping turtle. An on-the-ground survey by a qualified biologist is recommended in areas of suitable habitat to determine if the species is present. If present, TPWD recommends the applicant incorporate actions into the project plans to avoid impacts to this species. TPWD recommends the applicant inform employees and contractors of the potential for the alligator snapping turtle to occur within or near waterbodies within the project area and to avoid harming this species if encountered.

Mussels

Freshwater mussels are one of the most imperiled groups of animals in the U.S. Texas hosts more than 50 species of native freshwater mussels; fifteen freshwater mussel species are listed as threatened in Texas. Populations of these invertebrates have declined precipitously across North America. Most species are very sensitive to disturbance due to their sedentary lifestyle and dependence upon good water quality. Habitat alteration and loss, illegal and over-harvesting, and competition from introduced species are some of the factors in their decline.

Recommendations: TPWD recommends use of BMPs for riparian areas to minimize impacts on mussels (as well as all fish species which may serve as the mussels' larval host). BMPs should include measures such as avoiding construction during fish and mussel spawning periods, use of double silt fences, and doubling soil stabilization measures along the banks to avoid increasing the turbidity of waterways. If mussel populations are present within the limits of the proposed project area, those populations should be protected from disturbance to the greatest extent possible.

General Considerations:

Recommendation: TPWD recommends the applicant survey the project area to determine the potential of the site to support the aforementioned state-listed species or their habitat. Surveying the area prior to construction will provide an opportunity to adequately plan to avoid or minimize impacts to state-listed species. Please be aware that species not occurring during site surveys may utilize the habitat within the project area at times beyond those during which the survey was conducted, such as daily or seasonal activity cycles.

Recommendation: TPWD recommends avoiding disturbance to state-listed species during clearing, construction, operation and maintenance of the proposed reservoir. TPWD recommends a biological monitor be present during construction to assist in detecting state-listed species in the project area, especially in areas of suitable habitat including riparian woodlands, bottomland forest, and upland forest. For purposes of relocation, surveys, monitoring, and research, terrestrial state-listed species may only be handled by persons permitted through the TPWD Wildlife Permits Office.

Recommendation: A mixture of cover, food sources, and open ground is important to wildlife. TPWD recommends revegetating disturbed areas within suitable habitat with site-specific native, patchy vegetation rather than sod-forming grasses.

Species of Concern/Special Features

In addition to state and federally-protected species, TPWD tracks special features, natural communities, and rare species that are not listed as threatened or endangered. TPWD actively promotes

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their conservation and considers it important to evaluate and, if necessary, minimize impacts to rare species and their habitat to reduce the likelihood of endangerment and preclude the need to list. These species and communities are tracked in the TXNDD.

Please note that the absence of TXNDD information in an area does not imply that a species is absent from that area. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and cannot be used as presence/absence data. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously. As the project progresses and for future projects, please request the most current and accurate information at TexasNatural.DiversityDatabase@tpwd.texas.gov.

Recommendation: Please review the TPWD county list for Brazoria County, as rare species could be present depending upon habitat availability. These lists are available online using the TPWD RTEST web application. If during construction, the project area is found to contain rare species, natural plant communities, or special features, TPWD recommends that precautions be taken to avoid impacts to them. The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for federally listed species.

Determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty and then only with repeated negative observations, taking into account all the variable factors contributing to the lack of detectable presence. If encountered during construction, measures should be taken to avoid impacting wildlife.

Data Reporting and the Texas Natural Diversity Database

TPWD maintains records of occurrence for protected and rare species, or SGCN, within the TXNDD and these data are publicly available by request. The TXNDD is intended to assist users in avoiding harm to rare species or significant ecological features. The TXNDD is updated continuously, and relies partially on information submitted by private parties, such as developers or their consultants. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state.

Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features within a project area. Determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency, and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty, and then only with repeated negative observations, taking into account all the variable factors contributing to the lack of detectable presence. Please note that the absence of TXNDD information in an area does not imply that a species is absent from that area. These data are not inclusive and cannot be substituted for field surveys.

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Recommendation: To aid in the scientific knowledge of a species' status and current range, TPWD encourages reporting encounters of protected and rare species to the TXNDD according to the data submittal instructions found at the TPWD Texas Natural Diversity Database: Submit Data webpage.

Thank you for considering potential impacts to Texas' wildlife and natural resources during project planning.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Coastal Ecological Services Field Office
17629 El Camino Real, Suite 211
Houston, Texas 77058
281/286-8282 / (FAX) 281/488-5882



In Reply Refer To:
FWS/R2/CESFO/
02ETTX00-2018-
CPA-0029

July 2, 2020

Colonel Timothy Vail
U.S. Army Corps of Engineers, Galveston District
Regulatory Division
Attn: Jayson Hudson
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Colonel Vail:

Thank you for the opportunity to provide comments on the U.S. Army Corps of Engineers (Corps) permit application SWG-2016-01027 from Dow Chemical Company (Dow). Dow's Harris Reservoir Expansion Project (Project) includes the construction of a 1,929-acre impoundment with a storage capacity of 50,000 acre-feet; an intake and pump station from the Brazos River; an outlet to Oyster Creek; and, an emergency spillway. The Project includes floodplain enhancements on Oyster Creek, stream restoration, and temporary construction staging and laydown areas. The proposed Project is located between the Brazos River and Oyster Creek, approximately 8-miles northwest of the City of Angleton in Brazoria County, Texas.

The original permit was published on March 29, 2018, and the U.S. Fish and Wildlife Service (Service) provided comments on April 30, 2018. We participated in an agency site visit on May 10, 2018, and provided additional comments on May 30, 2018. In conjunction with those comments previously submitted to the Corps; information from the May 12, 2020 agency scoping meeting; and, the recent publication of the Notice of Intent to Prepare an Environmental Impact Statement¹, the Service is providing the following additional comments in accordance with the provisions of the Endangered Species Act (Act) of 1973 (16 U.S.C. 1531 et seq.) as amended; Sections 10 of the Rivers and Harbors Act of 1899; Section 404 of the Clean Water Act (33 U.S.C. 1251 et seq.); the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.); the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.); and, the Fish and Wildlife Coordination Act (16 U.S.C. 661-667(e)).

¹ Department of Army, U.S. Army Corps of Engineers. 2020. Notice of Intent to Prepare an Environmental Impact Statement and Public Scoping Meeting for Dow Chemical Company's Harris Reservoir Expansion Project, Brazoria County, Texas (Department of Army Permit SWG-2016-01027). Federal Register 85, No. 67; April 7, 2020. 19460-19462.

Colonel Vail

- In response to concerns regarding potential impacts to floodplains and hydrology, the Corps conducted several studies including a geomorphic assessment of Oyster Creek; a Level I and II stream assessment; a hydrology and hydraulic modeling report; modeling of areas downstream to confirm the floodplain storage; an updated interim hydrogeomorphic functional assessment to determine capacities of the waters of the U.S.; and, a Phase I Environmental Site Assessment¹. As a cooperating agency, we request all updated reports be provided to our office for a thorough project review and comment. Concerns related to these potential impacts may include, but are not limited to: increase in flooding within the floodplain of the Brazos River and Oyster Creek; mitigation needs to offset impacts to the floodplain, loss or conversion of riparian habitat, and bottomland forested areas; and, impacts to water quality and quantity as it relates to our federally-listed and candidate species and migratory birds.
- The Service is concerned with the clearing of the riparian zone where the pump/in-take station is proposed to be constructed on the Brazos River bank. The removal of the riparian zone along the banks of streams and rivers increases the risk and rate of erosion significantly causing water quality issues and habitat degradation. Impacts to this riparian zone can also alter flooding regimes and alter sensitive bottomland forested areas of habitat. The applicant should avoid and/or minimize impacts to riparian habitats to the maximum extent practical in the design of this Project, including any laydown and staging areas. We recommend implementing best management practices (attached) to minimize potential effects to the Brazos River, Oyster Creek, and their associated riparian zones and its delicate ecosystems.
- The proposed Project proposes to impact 12.19 acres of emergent wetlands, 4.15 acres of forested wetlands, and 20,486.3 linear feet (5.73 acres) of streams. Since the issuance of the public notice in 2018, both a functional and stream assessments were conducted in September 2019. The Corps verified the wetland delineation in October 2019 and plans to revise the conceptual mitigation plan based on these assessments. The applicant should develop a detailed stream mitigation plan pursuant to the requirements of 33 CFR 332.4 (c). We request that the Corps provide this plan to the Service and other resource agencies for review and comment prior to the issuance of this permit.
- We are concerned with temporal loss of forested wetland functions and values posed by the Project. Stream restoration and enhancement will likely require years to stabilize, become functional, and grow mature riparian zones. Loss of habitat for multiple generations could destabilize local populations of species with short life cycles (e.g. amphibians, birds, etc.). The applicant should conduct long-term monitoring of mitigation sites in order to capture the streams' timeframe of recovery², and as such, these details should be detailed in the mitigation planning documents.

² According to 33 CFR 332.3(e) of the Mitigation Rule, streams are resources that are difficult to replace. The riparian zones of restored streams have also been found to take 25 years or longer to recover (Hasselquist *et al.* 2015).

Colonel Vail

- A plan that includes post-construction site restoration and management activities should be developed and provided to the Service for review and comment. Such a plan should address potential management strategies (i.e. mowing, herbicide use, plantings); ways to avoid/minimize the introduction of nonnative aquatic and plant species into the ecosystem; and, address measures to avoid and/or minimize impacts of such activities to our trust resources (e.g. federally-listed and candidate species, migratory birds, aquatic resources).
- The applicant should conduct baseline and post-restoration assessments of macroinvertebrate (e.g. mussels), fish, and riparian zones within areas of the Project and the proposed in-stream mitigation sites. The Texas fawnsfoot (*Truncilla macrodon*) can potentially occur within the Colorado and Brazos River drainages. The species is currently a candidate and is under review by the Service to determine if protection under the Act is warranted.
- Per prior guidance, post-construction bank restoration strategies should strive to obtain a minimum surviving density of 400 stems/acre of trees and shrubs planted by year 3. Of those, 250 stems/acre should be six feet tall by year 7. As the stand matures and the canopy closes, light will be limited and competition will increase. This will lead to a decrease in population densities to between 100 and 250 stems/acre and producing, in concert with forest management strategies, a sustainable and productive community of native tree species.

Thank you for the opportunity to review and provide comments on this permit. Should additional information be needed, please contact Amber Bearb at 281-212-1501. We anticipate future coordination with Corps regarding their request for informal Section 7 consultation received on June 23, 2020.

Sincerely,



Charles Ardizzone
Project Leader

Enclosures

Best Management Practices For Projects Affecting Rivers, Streams And Tributaries

Colonel Vail

ENCLOSURE

**Best Management Practices For Projects Affecting Rivers,
Streams And Tributaries**

The project crosses or potentially affects river, stream or tributary aquatic habitat. Therefore the Service recommends implementing the following applicable Best Management Practices:

1. Construct stream crossings during a period of low streamflow (e.g., July - September);
2. Cross streams, stream banks and riparian zones at right angles and at gentle slopes;
3. When feasible, directionally bore under stream channels;
4. Disturb riparian and floodplain vegetation only when necessary;
5. Construction equipment should cross the stream at one confined location over an existing bridge, equipment pads, clean temporary native rock fill, or over a temporary portable bridge;
6. Limit in-stream equipment use to that needed to construct crossings;
7. Place trench spoil at least 25 feet away landward from streambanks;
8. Use sediment filter devices to prevent movement of spoil off right-of-way when standing or flowing water is present;
9. Trench de-watering, as necessary, should be conducted to prevent discharge of silt laden water into the stream channel;
10. Maintain the current contours of the bank and channel bottom;
11. Do not store hazardous materials, chemicals, fuels, lubricating oils, and other such substances within 100 feet of streambanks;
12. Refuel construction equipment at least 100 feet from streambanks;
13. Revegetate all disturbed areas as soon as possible after construction to prevent unnecessary soil erosion. Use only native riparian plants to help prevent the spread of exotics;
14. Maintain sediment filters at the base of all slopes located adjacent to the streams until right-of- way vegetation becomes established;
15. Maintain a vegetative filtration strip adjacent to streams and wetlands. The width of a filter strip is based on the slope of the banks and the width of the stream. Guidance to determine the appropriate filter strip (stream management zone, SMZ) width is provided below; and
16. Direct water runoff into vegetated areas.

Colonel Vail

SMZ WIDTH

SMZ widths should consider watershed characteristics, risk of erosion, soil type, and stream width. SMZ widths are measured from the top of each bank and established on each side of the stream. Erosion risk is increased with sandy soil, steep slopes, large watersheds and increasing stream widths. Recommended primary (refers to ephemeral streams) and secondary SMZ (refers to intermittent, braided, and perennial streams, lakes, and ponds) widths are provided in the table below.

Stream Width (Feet)	Slope (Percent)	Primary SMZ (Feet)	Secondary SMZ (Feet)
<20	< 7	35	0
<20	7-20	35	50
<20	>20	Top of slope or 150	75
20-50	<7	50	0
20-50	7-20	50	50
20-50	> 20	Top of slope or 150	75
> 50	< 7	Width of stream or 100 max.	0
> 50	7-20	Width of stream or 100 max.	50
> 50	> 20	Top of slope or 150	75

PERMIT REQUIREMENTS

A permit may be required from the U.S. Army Corps of Engineers should fill material be placed in wetlands or other waters of the United States. Should such a permit be issued, the BMP's contained in this enclosure, as well as other conservation provisions, should become permit conditions. Additional permit requirements may apply, depending upon the nature of individual projects.

Literature Cited

Arkansas Forestry Commission. 2001. Draft Arkansas Forestry Best Management Practices for Water Quality Protection.

From: [Hudson, Jayson M CIV USARMY CESWG \(USA\)](#)
To: [Whitney Fiore](#); [Christine Hartmann](#); [Kara Giblin](#)
Subject: FW: [Non-DoD Source] Re: SPN - SWG-2016-01027 - Dow Chemical Company - Brazos River and Oyster Creek - Brazoria County, Texas
Date: Tuesday, April 14, 2020 3:36:40 PM

EXTERNAL: This email originated from outside SWCA. Please use caution when replying.

I received this from NMFS last Friday in response to our special public notice and NOI. Looks like we can check the box on NMFS and EFH.

Jayson M Hudson
Regulatory Project Manager
409.766.3108

Please tell me how I am doing by completing the survey found at:
http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

-----Original Message-----

From: charrish stevens - NOAA Federal [<mailto:charrish.stevens@noaa.gov>]
Sent: Friday, April 10, 2020 11:26 AM
To: SWG201601027 <SWG201601027@usace.army.mil>; _NMFS ser HCDconsultations <nmfs.ser.hcdconsultations@noaa.gov>
Cc: Swafford, Rusty <rusty.swafford@noaa.gov>
Subject: [Non-DoD Source] Re: SPN - SWG-2016-01027 - Dow Chemical Company - Brazos River and Oyster Creek - Brazoria County, Texas

Hello Mr. Hudson,

The NMFS - HCD will not be commenting on the permit application, SWG-2016-01027, for the Harris Reservoir Expansion Project, since we do not have trust resources in this area. The project takes place in freshwater riverine systems and will not be acquiring any additional water rights. Therefore, no tidally influenced areas will be impacted by the proposed expansion of the Harris Reservoir.

Thank you for your coordination,

Charrish Stevens
Fishery Biologist
Habitat Conservation Division
NOAA National Marine Fisheries Service
4700 Av U, Galveston, TX 77551

Office Ph: (409) 766-3699
Fax: (409) 766-3575
Email: charrish.stevens@noaa.gov

<mailto:charrish.stevens@noaa.gov>

From: [charrish.stevens - NOAA Federal](#)
To: [Hinton, Michael E CIV USARMY CESWG \(US\)](#); [swg_public_notice](#); [_NMFS ser HCDconsultations](#); [SWG201601027](#)
Cc: [Swafford, Rusty](#)
Subject: [Non-DoD Source] Re: Notice Of Public Scoping Meeting For Dow Chemical Company's Harris Reservoir Expansion Project, Brazoria County, Texas (Department Of The Army Permit Number SWG-2016-01027)
Date: Friday, May 29, 2020 10:02:08 AM

Hello Mr. Hudson,

The NMFS - HCD's status on the Dow Chemical Company - Brazos River and Oyster Creek Harris Reservoir Expansion Project, permit application SWG-2016-01027 remains the same as our last response on April 10, 2020. We will not be providing comments on the aforementioned permit application, since we do not have any trust resources in this area. While the footprint of the reservoir is expanding, Dow will not be acquiring additional water rights to fill the proposed expansion. In addition, this proposed expansion occurs wholly in a freshwater riverine system. Therefore, not tidally influenced areas will be impacted by the proposed expansion of the Harris Reservoir.

Thank you,

Charrish Stevens
Fishery Biologist
Habitat Conservation Division
NOAA National Marine Fisheries Service
4700 Av U, Galveston, TX 77551

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Fax: (409) 766-3575
Email: charrish.stevens@noaa.gov
<<mailto:charrish.stevens@noaa.gov>>

On Fri, May 29, 2020 at 12:31 AM Hinton, Michael E CIV USARMY CESWG (US)
<Michael.E.Hinton2@usace.army.mil> <<mailto:Michael.E.Hinton2@usace.army.mil>> > wrote:

The U.S. Army Corps of Engineers, Galveston District has scheduled a Virtual Public Scoping Meeting on June 17, 2020 for the Dow Chemical Company's Harris Reservoir Expansion Project Environmental Impact Statement (EIS), for which you might be interested.

From: [charrish.stevens - NOAA Federal](#)
To: [SWG201601027; NMFS ser HCDconsultations](#)
Cc: [Swafford, Rusty](#)
Subject: [Non-DoD Source] Re: SPN - SWG-2016-01027 - Dow Chemical Company - Brazos River and Oyster Creek - Brazoria County, Texas
Date: Friday, April 10, 2020 11:26:47 AM

Hello Mr. Hudson,

The NMFS - HCD will not be commenting on the permit application, SWG-2016-01027, for the Harris Reservoir Expansion Project, since we do not have trust resources in this area. The project takes place in freshwater riverine systems and will not be acquiring any additional water rights. Therefore, no tidally influenced areas will be impacted by the proposed expansion of the Harris Reservoir.

Thank you for your coordination,

Charrish Stevens
Fishery Biologist
Habitat Conservation Division
NOAA National Marine Fisheries Service
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