Appendix J

Final Order from Court of Appeals

MANDATE

Court of Appeals

First District of Texas

NO. 01-15-00374-CV

UPPER TRINITY REGIONAL WATER DISTRICT AND
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, Appellants

V.

NATIONAL WILDLIFE FEDERATION, Appellee

Appeal from the 126th District Court of Travis County.
(Tr. Ct. No. D-1-GN-13-004342).

TO THE 126TH DISTRICT COURT OF TRAVIS COUNTY, GREETINGS:

Before this Court, on the 26th day of January 2017, the case upon appeal to revise or to reverse your judgment was determined. This Court made its order in these words:

> This case is an appeal from the final judgment signed by the trial court on March 6, 2015, which was transferred by the Supreme Court of Texas to this Court from the Court of Appeals for the Third District of Texas. After submitting the case on the appellate record and the arguments properly raised by the parties, the Court holds that there was reversible error in the trial court's judgment in the following respect: the partial reversal of the TCEQ's October 2, 2013 order. Accordingly, the Court **reverses** the trial court's judgment and **renders** judgment affirming TCEQ's October 2, 2013 order.

The Court orders that the appellee, National Wildlife Federation, pay all appellate costs.

The Court **orders** that this decision be certified below for observance.

Judgment rendered January 26, 2017.

Panel consists of Justices Jennings, Massengale, and Huddle. Opinion delivered by Justice Huddle.

WHEREFORE, WE COMMAND YOU to observe the order of our said Court in this behalf and in all things to have it duly recognized, obeyed, and executed.

June 9, 2017

Date

CHRISTOPHER A. PRINE
CLERK OF THE COURT

COURT OF APPEALS
OF THE STATE OF TEXAS

Court of Appeals

First District of Texas

BILL OF COSTS

No. 01-15-00374-CV

Upper Trinity Regional Water District and Texas Commission on Environmental Quality

v.

National Wildlife Federation

NO. D-1-GN-13-004342 IN THE 126TH DISTRICT COURT OF TRAVIS COUNTY

TYPE OF FEE	CHARGES	PAID/DUE	STATUS	PAID BY
MT FEE	$10.00	04/20/2016	E-PAID	ANT
MT FEE	$10.00	08/10/2015	E-PAID	ANT
MT FEE	$10.00	05/22/2015	E-PAID	ANT
CLK RECORD	$0.00	05/12/2015	UNKNOWN	ANT
RPT RECORD	$475.00	04/27/2015	PAID	ANT
TRANSFER	$20.00	04/08/2015	TRANSFER	ANT
TRANSFER	$100.00	04/08/2015	TRANSFER	ANT
TRANSFER	$25.00	04/08/2015	TRANSFER	ANT
TRANSFER	$50.00	04/08/2015	TRANSFER	ANT
TRANSFER	$50.00	04/01/2015	TRANSFER	ANT
TRANSFER	$100.00	04/01/2015	TRANSFER	ANT
TRANSFER	$25.00	04/01/2015	TRANSFER	ANT
TRANSFER	$20.00	04/01/2015	TRANSFER	ANT

The costs incurred on appeal to the First Court of Appeals Houston, Texas are $895.00.

Court costs in this case have been taxed in this Court's judgment

I, Christopher A. Prine, Clerk of the Court of Appeals for the First District of Texas, do hereby certify that this is a true statement of the costs of appeal in this case.

IN TESTIMONY WHEREOF, witness my hand and the seal of the Court of Appeals for the First District of Texas, this 9th of June, 2017.

COURT OF APPEALS
OF THE STATE OF TEXAS

CHRISTOPHER A. PRINE
CLERK OF THE COURT

Appendix K

Draft Operations Plan

Lake Ralph Hall

Draft Operations Plan

Revised:
October 9, 2017

Lake Ralph Hall
Draft Operations Plan

Revised October 9, 2017

Introduction

This Draft Operations Plan (Plan) for Lake Ralph Hall presents a strategy for operating the proposed reservoir in conjunction with Upper Trinity Regional Water District's (UTRWD or District) other water resources to meet the water supply needs of the District's current and potential future members and customers. This Plan outlines procedures to guide UTRWD in making decisions regarding how much water to divert from Lake Ralph Hall on an annual basis and on a daily basis in order to integrate this new supply with the District's other existing water resources. Actual daily operations will depend on UTRWD's inventory of water available in its portfolio of different supply sources, along with the capacity of its infrastructure to convey and treat raw water (considering maintenance, emergencies and other factors). This Plan is considered to be preliminary and subject to change depending on the District's future water demand and supply conditions.

System Limitations and Assumptions

UTRWD's current sources of water supply are available through contracts with the City of Dallas (DWU) that allow the District to divert water from Lewisville Lake and Ray Roberts Lake in the Elm Fork Trinity River basin and a contract with the City of Commerce that allows the District to divert water from Jim Chapman Lake in the Sulphur River basin. The District also has a permit from the Texas Commission on Environmental Quality (TCEQ), and supporting pass-through agreements with the Cities of Dallas and Denton, that allow the District to reuse a portion of the water it imports from Jim Chapman Lake.

UTRWD operates two water treatment plants (WTP), the Tom Harpool WTP (Harpool Plant) located in Aubrey, Texas, and the Thomas E. Taylor WTP (Taylor Plant) located in Lewisville, Texas.

- Presently the Harpool Plant is supplied with raw water from Jim Chapman Lake (Chapman Lake) via the Irving Pipeline, which the District is authorized to use under a contract with the City of Irving. Once Lake Ralph Hall is constructed and placed into service, it will be used in conjunction with Chapman Lake to supply the Harpool Plant. For purposes of this Plan, the Harpool Plant's raw water supply sources are assumed to include Chapman Lake, Lake Ralph Hall, or a combination of the two, with deliveries made via a direct pipeline connection. Currently the Taylor Plant is supplied raw water from the following sources.
    - Raw water diverted directly from Lewisville Lake
    - Raw water from Chapman Lake delivered to Lewisville Lake via the Irving Pipeline and Doe Branch Creek
    - Chapman Lake reuse water after it has been treated and discharged into the Elm Fork Trinity River basin upstream of Lewisville Lake
- Once Lake Ralph Hall is constructed, the Taylor Plant will draw its raw water supply according to the following priority:
    - Any water available to the District under its Reuse Permit issued by TCEQ
    - Supplies available from Chapman Lake and/or Lake Ralph Hall (up to firm yield) not used at the Harpool Plant
    - Water purchased from City of Dallas

In summary, for the purposes of this Plan, it is assumed that the Harpool Plant will only utilize raw water from Chapman Lake or Lake Ralph Hall, and the Taylor Plant will utilize raw water from Lewisville Lake,

Chapman Lake, and Lake Ralph Hall and reuse water originating from either Chapman Lake or Lake Ralph Hall.

Under the Texas water rights permit No. 5821, the UTRWD is authorized to impound flows in Lake Ralph Hall on the North Sulphur River and to divert up to a maximum of 45,000 acre-feet/year of water from the reservoir to meet the water supply needs of the District's customers and certain users in Fannin County, Texas. Lake Ralph Hall will be constructed with a maximum conservation storage capacity of 160,235 acre-feet when the water surface of the reservoir is at elevation 551.0 feet msl. When the level of the reservoir is above this storage condition, an uncontrolled overflow spillway will automatically pass inflows downstream to the North Sulphur River, to the extent they are not diverted by UTRWD to meet its water supply needs. When Lake Ralph Hall is not full, low-flow outlet facilities also will be able to pass inflows through the reservoir to which downstream senior-priority water rights are entitled as directed by the TCEQ. Stored water will not be released for meeting these senior-priority calls. Lake Ralph Hall will have one or more pump station(s) to divert water from the reservoir to meet the water supply needs of the District's customers and certain users in Fannin County, with the Fannin County supply limited to the needs of those portions of Fannin County that lie within the North Sulphur River Basin (less any supplies from other sources) under the terms of the contract between UTRWD and the City of Ladonia.

General System Operating Concepts

As described above, UTRWD's available water resources for meeting its customers' demands include Lake Ralph Hall, Jim Chapman Lake, the City of Dallas Water Utilities (DWU) contract, and treated wastewater reuse at Lake Lewisville. These various sources of supply will be utilized by UTRWD through a system operation that attempts to optimize the overall supply in a manner that maximizes water availability while minimizing the cost to UTRWD's customers. Outlined below are general underlying concepts for operation of the District's water supply system:

- The Lake Ralph Hall and Jim Chapman Lake supplies will function as a sub-system within the District's overall water supply system (LRH/JCL Sub-system), with water utilized from each reservoir in a manner that attempts to optimize the total supply from both reservoirs.

- While UTRWD will assess its water supply and demand conditions on a weekly basis, generally UTRWD will utilize its different water supply resources on a daily basis to meet its customers' demands in the following priority order; although, day to day demand changes and system conditions occasionally may dictate a different priority order:

    i. Reuse of all available treated wastewater discharged into Lake Lewisville the previous day

    ii. Use of water from LRH/JCL Sub-system to the maximum extent possible in order to maximize the available supply of reuse water on the following day

    iii. Purchase of DWU contract water (stored water) to meet any remaining demands

- Generally, Lake Ralph Hall water will be utilized on a daily basis in the following priority order; although, day to day demand changes and system conditions occasionally may dictate a different priority order:

    i. To provide raw water supply for Harpool Plant

    ii. To provide raw water supply for Taylor Plant after evaluating the availability of other contract supplies

    iii. For temporary raw water sales, if agreed to by UTRWD, to District members and other customers

Operation of LRH/JCL Sub-System

The Plan as outlined herein presents a basis for UTRWD to make operational decisions regarding diversions from Lake Ralph Hall and the District's other water resources. The actual daily operations will vary and focus on maximizing the total quantity of water available from UTRWD's water resource portfolio while minimizing costs, subject to contractual and permit limitations. With Lake Ralph Hall and Chapman Lake operated as a sub-system of the District's overall water supply system, the key elements of how these projects will be utilized are described below:

- Initially, the overarching goal of utilizing water from the LRH/JCL Sub-system will be to maximize annual diversions to the extent of each reservoir's firm annual yield, without intentionally overdrafting either reservoir. This goal may change after experience is gained operating the system in order to more effectively meet the water demands of the District's customers.

- Generally, the LRH/JCL Sub-system will be operated in a manner that utilizes water from each reservoir in proportion to the reservoirs' firm annual yields, taking into consideration current reservoir storage conditions.

- Although differences in the reservoirs' storage, evaporation, and/or hydrologic conditions occasionally may dictate the use of certain modified operating procedures, generally UTRWD will utilize water from the LRH/JCL Sub-system in the following priority order:

    i. When the water surface of Lake Ralph Hall is above its conservation pool level (Elev. 551 feet) and the volume of storage in the District's pool in Jim Chapman Lake is below its conservation pool capacity (30,003 acre-feet), then only diversions from Lake Ralph Hall will be made up to the maximum allowable diversion rate and to the extent these diversions can meet the LRH/JCL Sub-system demand (see 1.c above).

ii. When the volume of storage in the District's pool in Jim Chapman Lake is at its conservation pool capacity (30,003 acre-feet) and the water surface of Lake Ralph Hall is below its conservation pool level, then only diversions from Jim Chapman Lake will be made up to the maximum allowable diversion rate and to the extent these diversions can meet the LRH/JCL Sub-system demand (see 1.c above).

iii. If neither Case i or Case ii above is in effect or if the water surface of Lake Ralph Hall is above its conservation pool level and the volume of storage in the District's pool in Jim Chapman Lake is at its conservation pool capacity, then the diversions from Lake Ralph Hall and from Jim Chapman Lake to meet the LRH/JCL Sub-system demand (see 1.c above) will be adjusted to be approximately proportional to the firm annual yields of the two reservoirs. For this purpose, the firm annual yield of Lake Ralph Hall is set at 34,050 acre-feet/year, and the firm annual yield of the District's pool in Jim Chapman Lake is set at 12,909 acre-feet/year. Based on these firm annual yield amounts, 72.5% of the LRH/JCL Sub-system demand will be met with diversions from Lake Ralph Hall, and 27.5% of the LRH/JCL Sub-system demand will be met with diversions from Jim Chapman Lake.

iv. As a safety check to minimize the potential to draw down storage in either the Lake Ralph Hall conservation pool or in the District's pool in Jim Chapman Lake to zero, when the storage in either of these pools falls to less than 25% of its full conservation pool capacity, all diversions to meet the LRH/JCL Sub-system demand will be made from the other pool. This mode of operation will continue until the storage in both pools is less than 25% of their conservation pool capacities or until the storage in both pools is greater than 25% of their full conservation pool capacities, at which time diversions from the pools will be made in accordance with the procedures described above for Case iii.

Appendix L

Mitigation Plan

MITIGATION PLAN
FOR IMPACTS TO AQUATIC RESOURCES AND TERRESTRIAL HABITATS

PROPOSED LAKE RALPH HALL

USACE Project No.: 2003-00336

Applicant:
UPPER TRINITY REGIONAL WATER DISTRICT

Prepared by:
ALAN PLUMMER ASSOCIATES, INC.

In association with:
CH2M
CP&Y, Inc.
Freese and Nichols, Inc.

February 5, 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

Acronym	Definition
APAI	Alan Plummer Associates, Inc.
AJD	Approved Jurisdictional Determination
BMPs	Best Management Practices
CR	County Road
CRT	Cooperating Agencies Review Team
EIS	Environmental Impact Statement – Draft and/or Final
EPA	U.S. Environmental Protection Agency
FCI	Functional Capacity Index
FCU	Functional Capacity Unit
FM	Farm to Market
fps	feet per second
GCS	Grade Control Structure
HUC	Hydrologic Unit Code
LRH	Lake Ralph Hall
LWD	Large Woody Debris
MOA	Memorandum of Agreement
msl	Mean Sea Level
NAIP	National Agricultural Imagery Program
NSR	North Sulphur River
OHWM	Ordinary High Water Mark
PRM	Permittee Responsible Mitigation
SH	State Highway
SWAMPIM	Stream Watershed Assessment and Measurement Protocol Interaction Model
SJD	Supplemental Jurisdictional Determination
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
U.S.	United States
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
UFWS	U.S. Fish and Wildlife Service
USFS	U.S. Forest Service
UTRWD	Upper Trinity Regional Water District
WHAP	Wildlife Habitat Appraisal Procedure
WMA	Wildlife Management Area

DEFINITION OF TERMS

Term	Definition
Assessment Area	Approximately 13,094 acres including the proposed Project Boundary and Preliminary Mitigation Boundary documented in the Supplemental Jurisdictional Determination (SJD) Report prepared by APAI dated June 21, 2017 and confirmed in the Approved Jurisdictional Determination from USACE dated July 27, 2017. Shown on Figures -11 of the SJD Report Mapbook in Appendix B
Pipeline Assessment Area	An approximately 32-mile long, 100-foot wide corridor in which the proposed raw water pipeline from LRH to a connection with the existing Chapman Lake (Irving) pipeline would be constructed. The Pipeline Assessment Area occupies approximately 371 acres. Shown in Appendix A – Figure A-2
Project Area	General area around and including Project Boundary and Proposed Mitigation Boundary
Project Boundary	Approximately 11,060 acres including Conservation Pool, embankment/ dam, emergency spillway, and approximate boundary at 560’ msl. Shown in Appendix A – Figure A-1
Preliminary Aquatic Resources Mitigation Boundary	Approximately 2,034 acres between proposed dam and FM 904 and Baker Creek included in the assessment area documented in the Supplemental Jurisdictional Determination Report dated June 21, 2017 and confirmed in Approved Jurisdictional Determination from USACE dated July 27, 2017. Shown as part of the SJD Assessment Area in Figures 4 and 8 of the SJD Report Mapbook in Appendix B.
Proposed Aquatic Resources Mitigation Boundary	Approximately 1,925 acres between proposed dam and FM 904 and Baker Creek. Shown in Appendix A – Figures A-1, A-4, and A-7.

MITIGATION PLAN FOR THE PROPOSED LAKE RALPH HALL PROJECT
USACE PERMIT NUMBER: SWF-2003-00336

I. INTRODUCTION

A. Project Information

Project Name: Upper Trinity Regional Water District's (UTRWD's) Lake Ralph Hall (LRH) Reservoir Project

SWF Permit Number: 2003-00336

Project Components: The proposed project would consist of the impoundment of the North Sulphur River (NSR) and tributaries, which would result in the creation of a 7,568-acre reservoir at conservation pool (elevation 551 feet mean sea level (msl)). Project components would consist of the construction of an earthen dam (Charles L. (Leon) Hurse Dam), construction of spillway systems (service and emergency) associated with the dam, construction of an intake structure and raw water conveyance pump station, construction of an approximately 32 mile raw water conveyance pipeline, and realignments/modifications to the following existing roads:

- State Highway (SH) 34,
- Farm to Market (FM) Road 1550, and
- County Roads (CR) 3380, 3395, 3443, 3444, and 3640.

The proposed mitigation for the proposed project would include permittee responsible mitigation (PRM) for impacts to aquatic resources as required by Section 404 of the Clean Water Act and for impacts to terrestrial resources pursuant to the LRH state water right, Water Use Permit Number 5821, within specified areas in connection with the proposed reservoir project.

Project Location: The proposed reservoir project would be located north of the City of Ladonia in Fannin County, Texas. Specifically, the center point of the dam would be located at 33.463º North Latitude and -95.901º West Longitude on the NSR. Mitigation activities for the proposed

project impacts to aquatic functions would be located within the designated mitigation area located downstream of the proposed Leon Hurse Dam between the dam (to the west) and FM 904 and/or Baker Creek (to the east). Mitigation activities for the proposed project impacts to terrestrial habitat, as required by Water Use Permit 5821, Special Condition M, would be located within the proposed reservoir project boundary upstream of the proposed Leon Hurse Dam between elevation 551 feet (conservation pool boundary) and 560 feet (project boundary). A general location map showing the project and mitigation boundary is included as Figure A-1 in Appendix A. The proposed approximately 32-mile raw water conveyance pipeline would be situated in Fannin, Hunt, and Collin Counties. The proposed pipeline corridor is shown on Figure A-2 in Appendix A.

Watershed: The proposed reservoir project would be located in the Sulphur River Basin's 8-digit Hydrologic Unit Code (HUC) 11140301. The proposed raw water conveyance pipeline would be located in the Sulphur, Sabine, and Trinity River Basins. Their respective 8-digit HUC's are 11140301, 12010001, and 12030106.

B. Project Area Background

The proposed LRH reservoir project site, along the NSR in Fannin County, is unique in Texas. Actions by the agricultural community in the 1920s, specifically channelization (straightening of the channel thus steepening stream gradient), altered the flow regime for the NSR and numerous named tributaries to the NSR. These actions, completed around the year 1929, resulted in exceptional erosion impacts along the NSR and its tributaries; thereby, impairing and substantially degrading the hydrologic, biogeochemical, and both aquatic and terrestrial habitat functions within the proposed project area. To date, the degradation continues and is projected to continue into the foreseeable future without corrective action.

The channelized portion of the NSR, originally constructed to a depth of approximately 10 feet with a width on the order of 16 to 20 feet, is now more than 60 feet deep with a width of approximately 350 feet in places.[1] A majority of the terrestrial habitat that remained following clearing for agricultural cropland along the edge of the original channel has been lost to erosion.

[1] Taylor, Thomas E. *A Brief History of the Project to Channelize the North Sulphur River*. January 24, 2011.

The remaining habitat along the abandoned meanders of the former NSR trace has been significantly impacted due to agricultural pursuits in the original floodplain. Currently, the eroded river channel has such enormous hydraulic capacity that the 100-year flood is wholly contained within the channel.[2] Thus, the original floodplain has been abandoned and the land adjacent to the NSR and for a considerable distance up its tributaries no longer experiences periodic overbanking or flooding.

Since the degree of erosion within this river system was unique, a stream geomorphology study[2] was commissioned for the following reasons:

1. to assess the past and current erosion of the NSR and its tributaries,
2. to develop certain predictive information about the value of the project with respect to stemming erosion, and
3. to predict the degree of future erosion in the absence of a project.

The report concluded that the proposed LRH project would benefit aquatic and terrestrial resources by providing sufficient hydrology to maintain water within portions of the NSR channel by creating a grade control and by stemming erosion.

In the absence of the proposed project, the study confirmed that stream and channel erosion would continue unabated. The cited geomorphology study predicted a lateral rate of bank erosion at four inches per year (two inches on each bank). This rate was specifically applicable where shale (bedrock underlying the area) was encountered as the result of vertical erosion. Specific conclusions from the geomorphology report state:

> *"In the absence of the Lake Ralph Hall project, there will be continued erosion of the North Sulphur River and its tributaries. On average, where shale is exposed in the bed and banks of the channels, the channel depth will increase by about 16 feet over a 50-year period. Increased channel depths are also likely to cause*

[2] Mussetter Engineering, Inc. *Geomorphic and Sedimentation Evaluation of North Sulphur River and Tributaries for the Lake Ralph Hall Project.* October 23, 2006.

further mass failure of the alluvial portions of the banks. Thereby increasing channel top widths, as well."

The geomorphology report also concluded that tributaries to the NSR would experience a similar erosional fate, driven by the extreme slope gradient of the deeply incised NSR. Erosion, deepening and widening of the tributary channels, would continue upstream – well beyond their current configuration. Currently, the trace of the proposed conservation pool somewhat defines the upslope extent to which the accelerated erosion has reached both within the NSR and its tributaries.

The geomorphology report determined that in the absence of the proposed project, this head-ward incision and erosion would continue, with the attendant loss of riparian and terrestrial habitat and aquatic stream functions. With the lake in place, the base surface and ground water gradients of the NSR system would be raised to elevation 551 feet msl (approximately 90 feet higher than the existing condition) upstream of the proposed dam. By raising the gradient of the NSR, the tributary slopes would be significantly reduced from the anticipated future degraded condition thus returning the system to a configuration that more closely resembles the pre-channelized condition; and hence, restoring the geomorphologic process to a more natural progression.

C. Description of the Mitigation Area

The proposed areas identified for aquatic mitigation are in the NSR watershed immediately downstream of the proposed Leon Hurse Dam site between the dam (to the west) and FM 904 and Baker Creek (to the east). The proposed areas identified for terrestrial mitigation (as required for Water User Permit Number 5821) are in the NSR watershed above conservation pool (elevation 551 feet msl) within the proposed LRH project boundary (approximately 560 feet msl upstream of the proposed Leon Hurse Dam site). As mentioned previously, aquatic resources and terrestrial habitats in the vicinity of the proposed project have been degraded by agricultural practices and past channelization projects within the NSR watershed. These anthropogenic activities have resulted in continued exacerbated erosion problems within the NSR watershed. As an example, extreme erosion has provided a channel capacity for the NSR and its tributaries

within the project boundary that contains the 100-year flood flow. Thus, the NSR and its tributary channels within the project boundary are disconnected from their historical floodplains, and this adverse effect of past actions is working its way upstream. The agricultural practice of clearing land for crops and pasture has fragmented many of the remaining habitat areas within the project boundary.

Detailed descriptions of the general project area, including the U.S. Forest Service (USFS)'s National Grasslands (Ladonia Unit of the Caddo National Grassland Wildlife Management Area (WMA)), are provided in reports documenting the existing conditions of the project area which are summarized in the Environmental Impact Statement (EIS). These reports include the Preliminary Habitat Assessment report[3] prepared by Alan Plummer Associates, Inc. (APAI) dated December 6, 2005 (updated August 2011); the preliminary jurisdictional determination (PJD) report[4] prepared by APAI dated October 10, 2006; a supplemental jurisdictional determination report[5] (SJD) prepared by APAI dated June 21, 2017 (concurrence with SJD received from USACE as an approved jurisdictional determination (AJD) in letter dated July 27, 2017) (SJD report and AJD letter included in Appendix B); and the Environmental Information Document for Lake Ralph Hall[6] submitted October 30, 2006. Additional information regarding the Ladonia Unit of the Caddo National Grasslands is available in the Environmental Assessment – United States Department of Agriculture (USDA) USFS Ladonia Watershed Landscape Analysis, downloaded from the USDA USFS website[7] and the Management Plan – Caddo Wildlife Management Area[8] received from the Texas Parks and Wildlife Department (TPWD) via email on August 17, 2005.

Additional detailed descriptions of the proposed project area are provided in the reports documenting the various studies conducted for the project, which include the *Hydrologic and*

[3] Alan Plummer Associates, Inc. *Lake Ralph Hall Preliminary Habitat Assessment*. December 6, 2005 updated July 2011.
[4] Alan Plummer Associates, Inc. *Preliminary Jurisdictional Determination of Waters of the U.S.* October 26, 2006.
[5] Alan Plummer Associates, Inc. *Supplemental Report in Support of Request for Approved Jurisdictional Determination of Waters of the United States.* June 21, 2017
[6] Alan Plummer Associates, Inc. and Chiang, Patel, and Yerby, Inc. *Draft Environmental Information Document for the Proposed Lake Ralph Hall*. October 26, 2006.
[7] http://www.fs.fed.us/r8/texas/planning/nepa_index.shtml downloaded August 17, 2005.
[8] TPWD Caddo Wildlife Management Area 2005 Strategic Plan via email correspondence August 17, 2005.

Hydraulic Studies of Lake Ralph Hall[9] conducted by R.J. Brandes Company and dated April 27, 2004; the *Archaeology and Quaternary Geology at Lake Ralph Hall, Fannin County, Texas*[10] report prepared by AR Consultants, Inc. dated December 7, 2005; the *Geomorphic and Sedimentation Evaluation of North Sulphur River and Tributaries for the Lake Ralph Hall Project*[11] prepared by Mussetter Engineering, Inc. dated October 23, 2006, and the *Summary of Alternative Dam Site Analysis and Pipeline Route Alternatives for Proposed Lake Ralph Hall*[12] prepared by CH2M HILL and CPY, Inc. dated May 2011. These reports are also summarized in the EIS.

D. Purpose and Need for Project

The proposed LRH reservoir project would be developed for water supply primarily and as a recreational amenity. The sponsor for implementation of this reservoir project is the UTRWD. The Texas Legislature created the UTRWD in 1989 to serve water, wastewater, storm water, and solid waste needs for portions of North Central Texas. Planning for the provision of these services is a major component of the UTRWD's mission. Long-range water supply planning efforts identified forecasts for significant increases in population within the UTRWD's service area with a commensurate increase in water demands that must be met through conservation and increased water supplies.[13,14] Based on an assessment of current and anticipated supplies, UTRWD believes water demands will exceed supplies before the year 2030 and the shortfall will grow considerably by 2060. The applicant's need for additional water supplies was independently analyzed by USACE through supply and demand evaluations in preparation of the EIS in accordance with 40 CFR 1506.5(a). Detailed descriptions of the purpose and need for the proposed project is included in the EIS.

---

[9] R. J. Brandes Company. *Hydrologic and Hydraulic Studies of Lake Ralph Hall*. April 27, 2004.
[10] AR Consultants, Inc. *Archaeology and Quaternary Geology at Lake Ralph Hall, Fannin County, Texas. Texas Antiquities Permit 3693*. December 7, 2005.
[11] Mussetter Engineering, Inc. *Geomorphic and Sedimentation Evaluation of North Sulphur River and Tributaries for the Lake Ralph Hall Project.* October 23, 2006.
[12] CH2M HILL and CPY, Inc. *Summary of Alternative Dam Site Analysis and Pipeline Route Alternatives for Proposed Lake Ralph Hall*. May 2011.
[13] Freese and Nichols, Inc., Alan Plummer Associates, Inc., CP&Y, Inc., and Cooksey Communications, Inc. *2011 Region C Water Plan* prepared for the Region C Water Planning Group. October 2010.
[14] Freese and Nichols, Inc., Alan Plummer Associates, Inc., CP&Y, Inc., and Cooksey Communications, Inc. *2016 Region C Water Plan* prepared for the Region C Water Planning Group, December 2015.

II. AVOIDANCE AND MINIMIZATION

A. Proposed Reservoir Alternatives

Projects subject to Clean Water Act (CWA) regulations must comply with CWA Section 404(b)(1) Guidelines (40 CFR, Part 230) for the discharge of dredge and fill material into waters of the U.S. The Section 404(b)(1) Guidelines require that the USACE permit only the least environmentally damaging practicable alternative (LEDPA), unless the LEDPA has other significant adverse environmental consequences. The USACE's evaluation typically includes a determination of whether the applicant has taken sufficient measures to mitigate the project's likely adverse impact on the aquatic ecosystem.

In a Memorandum of Agreement (MOA) signed February 6, 1990 between the USACE and the EPA, mitigation was defined as a sequential process of avoiding, minimizing, and compensating for adverse impacts to the aquatic ecosystem:

> Avoid: Take all appropriate and practicable measures to avoid adverse impacts to the aquatic ecosystem that are not necessary.
>
> Minimize: Take all appropriate and practicable measures to minimize adverse impacts to the aquatic ecosystem that cannot reasonably be avoided.
>
> Compensate: Implement appropriate and practicable measures to compensate for adverse project impacts to the aquatic ecosystem that cannot reasonably be avoided or further minimized. This step is also referred to as compensatory mitigation. The purpose of compensatory mitigation is to replace aquatic ecosystem functions that would be lost or impaired as a result of a USACE-authorized activity.

In the time period between now and 2030, the probability of an alternative solution to traditional surface water supply systems is remote. Local groundwater resources in the Dallas-Fort Worth

area are inadequate.[15] Conservation alone cannot support the need for additional water supply. Avoidance then, on a macro scale, becomes where would the project be located, not what other project could be substituted for a surface water supply project. Ultimately, the UTRWD selected the upper headwaters of the NSR to site the dam for the reservoir project. A complete discussion of the alternatives analysis conducted by the USACE during review of the proposed LRH project is provided in the EIS.

Reservoir Project Alternatives

Specific to the proposed LRH reservoir project, four alternative dam locations, Dam Sites A, B, C, and D, were considered on the NSR. The preferred alternative, Dam Site C, was selected since it specifically meets the identified purpose and need for the proposed project. Dam Sites A and B were located upstream of Dam Site C with Dam Site D being located downstream of Dam Site C. All alternatives analyzed featured a conservation pool elevation of 551 feet msl.

The preferred dam site location was chosen to optimize the lake size with respect to desired water supply yield from the project thus minimizing unwarranted impacts to aquatic resources. An impoundment volume at elevation 551 feet msl for conservation pool was determined that would yield an adequate, affordable supply of water for UTRWD's customers. Further, the reservoir's dam location was sited in the upper drainage area for the NSR to minimize downstream impacts to the river channel and its tributaries yet still provide a dependable yield for water supply. In conclusion, significant efforts were made to avoid and minimize impacts to aquatic resources within the project area. Detailed information regarding the analysis of alternatives and associated avoidance and minimization measures is included in the EIS for the proposed LRH project.

Avoidance and Minimization Efforts during Construction

Multiple actions would be taken during construction to protect streams and other aquatic areas, including their associated buffer zones within and adjacent to the project boundary. These actions include but are not limited to: confining construction materials and debris to areas

[15] Freese and Nichols, Inc., Alan Plummer Associates, Inc., CP&Y, Inc., and Cooksey Communications, Inc. *2016 Region C Water Plan* prepared for the Region C Water Planning Group, December 2015.

identified within the construction site; stabilizing disturbed areas at the earliest possible date with the use of permanent or temporary vegetation, blankets, matting, mulch, or sod; isolating the construction area from adjacent streams by using and maintaining coffer dams, sand bag berms, silt fencing, triangular filter dikes, rock berms, or hay bale dikes or other appropriate Best Management Practices (BMPs) around the perimeter of the areas impacted by construction; protecting vegetation from unnecessary damage; and performing all proposed construction activities within the reaches of the stream channels during low flow conditions to minimize sediment introduction into downstream waters.

B. Proposed Pipeline Alternatives

For the conveyance of raw water to UTRWD owned and operated facilities, nine alternative pipeline routes were considered. Currently, the UTRWD, in a partnership with the City of Irving, conveys raw water from Jim Chapman (also known as Cooper) Lake through the existing Chapman Lake (Irving) Pipeline, which is located south of the proposed LRH reservoir project area. Initially, four pipeline alternatives were considered for conveying raw water from the proposed LRH to the existing Irving pipeline. In addition to conveying water to the existing Irving pipeline, five pipeline route alternatives were considered for conveying raw water directly from LRH to the UTRWD's Tom Harpool Water Treatment Plant, located along Lewisville Lake in Denton County, Texas. Two of these nine pipeline alternatives were evaluated for further consideration; one would convey raw water to the existing Irving pipeline and the other would convey raw water directly to UTRWD's Tom Harpool Water Treatment Plant.

Complete avoidance of aquatic resources with pipelines of this length is unattainable. Accordingly, efforts were made to minimize impacts to aquatic resources to the extent practicable while maintaining an economical route alternative. Pipeline Alternative #4 was selected as the preferred pipeline alignment. This alignment from LRH to the existing Irving pipeline has the shortest length and evaluation indicates it would result in the least amount of impacts to aquatic resources. Information regarding the analysis of pipeline alternatives and associated avoidance and minimization measures is included in the EIS.

III. COMPENSATORY MITIGATION

The mitigation needs for the proposed LRH were evaluated on the basis of a project-specific functions assessment protocol for aquatic resources (detailed in Section III.A.1) and the TPWD's Wildlife Habitat Appraisal Procedure (WHAP) (detailed in Section III.B.1) for terrestrial resources.[16] These accepted assessment methodologies were selected to effectively evaluate the existing conditions of the proposed project area. A project specific methodology, further described below, was used to predict or project the aquatic resource functions with proposed mitigation activities in place.

A. Aquatic Resources Mitigation

1. Stream Watershed Assessment and Measurement Protocol Interaction Model (SWAMPIM)

A functions-based assessment protocol, known as the SWAMPIM, was developed for the proposed project to:

1. Assess the functions of existing streams and on-channel impoundments in their current condition;
2. Quantify impacts to existing functions provided by the streams and on-channel impoundments within the project boundary; and
3. Provide a "currency" for determining mitigation requirements and for quantifying functional capacity of projected conditions based on proposed mitigation activities.

SWAMPIM is an assessment tool based primarily on geological and morphological habitat characteristics, floodplain and riparian conditions, and water quality metrics. It was developed based on other extensively peer-reviewed protocols, including protocols developed by federal and state agencies. SWAMPIM focuses on three major categories of functions for aquatic resources including hydrologic, biogeochemical/water quality, and habitat. The SWAMPIM methodology, included in Appendix C, was reviewed by the cooperating agencies and accepted as an approved aquatic resource assessment methodology for the LRH reservoir project by the

[16] Mitigation for impacts to terrestrial resources required as condition of TCEQ Water Use Permit No. 5821

EPA. A copy of a letter dated March 24, 2015 from the EPA accepting SWAMPIM as an approved assessment methodology is included in Appendix D.

A functional assessment approach was desired due to the stated purpose of compensatory mitigation as the replacement of aquatic ecosystem functions lost or impaired as a result of a USACE authorized activity.[17] Accordingly, SWAMPIM provides an assessment of aquatic functions within the proposed project area's immediate watershed and estimates the functional values following development of the proposed project. SWAMPIM then compares this value to the baseline value of aquatic resources to quantify the amount of compensatory mitigation required to offset impacts to aquatic resources. Once the proposed project components are constructed and mitigation activities completed, monitoring of the permittee responsible mitigation will use SWAMPIM to document achievement of the projected mitigation functional capacity.

2. Summary of Impacts to Aquatic Resources Resulting from Reservoir Construction

Waters of the U.S. within the Reservoir Project Boundary

Initial documentation of the waters of the U.S. within the reservoir project boundary was provided in the PJD report dated October 10, 2006 prepared by APAI. The PJD report was updated June 21, 2017 and summarized in a SJD report also prepared by APAI. The SJD was submitted to the USACE with a request to approve the jurisdictional determination. On July 27, 2017, the UTRWD received confirmation of an AJD from the USACE. The SJD report and copy of the correspondence confirming the AJD are included in Appendix B.

Within the 13,094 acre assessment area[18] documented in the SJD, approximately 501,058 linear feet of streams and an additional 56.19 acres associated with 33 on-channel impoundments were identified within the footprint of the conservation pool, embankment, and spillway areas. Lacustrine fringe wetland areas associated with the aforementioned 33 on-channel impoundments totaled approximately eight acres (these eight acres are included in the on-channel impoundment acreage summation). Within the remainder of the assessment area (which

[17] USACE 2002 Mitigation Regulatory Guidance Letter (RGL) 02-2
[18] Assessment area includes the proposed project boundary and preliminary mitigation boundary.

included the area above the conservation pool and the preliminary mitigation boundary), an additional 189,860 linear feet of stream channels were identified plus 14 additional on-channel impoundments representing 13.69 acres. Lacustrine fringe wetland areas associated with the 14 additional on-channel impoundments totaled approximately two acres (included in the 13.69 acreage summation). Other aquatic resources considered isolated and therefore not a water of the U.S. identified within the overall assessment area included 212 upland stock ponds totaling 83 acres and 3.8 acres of isolated forested wetlands.

Figure A-3 included in Appendix A shows the delineated aquatic resources within the proposed 13,094-acre assessment area. All of the identified tributaries to the NSR are characterized as ephemeral, with the NSR classified as intermittent. Table 1 summarizes the identified waters of the U.S. within the 13,094 acre assessment area.

TABLE 1: SUMMARY OF WATERS OF THE U.S. WITHIN THE 13,094-ACRE RESERVOIR ASSESSMENT AREA

Category	Description	Linear Feet
Streams Within Conservation Pool, Embankment, Spillway of LRH		
Stream Channel	Ephemeral 0.5 - 2.0' wide North Side	26,835
Stream Channel	Ephemeral 2.5 - 5.0' wide - North Side	88,309
Stream Channel	Ephemeral 6 - 15' wide - North Side	55,023
Stream Channel	Ephemeral >16' wide - North Side	82,713
Stream Channel	Ephemeral 0.5 - 2.0' wide South Side	19,769
Stream Channel	Ephemeral 2.5 - 5.0' wide - South Side	66,967
Stream Channel	Ephemeral 6 - 15' wide - South Side	92,155
Stream Channel	Ephemeral >16' wide - South Side	13,717
Stream Channel	Intermittent - NSR @ SH34	55,570
Sub-Total within Conservation Pool, Embankment, Spillway of LRH		**501,058**
Streams Outside Conservation Pool, Embankment, Spillway but within Assessment Area		
Stream Channel	Ephemeral 0.5 - 2.0' wide North Side	11,513
Stream Channel	Ephemeral 0.5 - 2.0' wide North Side - Baker Creek Tributaries	2,639
Stream Channel	Ephemeral 2.5 - 5.0' wide - North Side	22,872
Stream Channel	Ephemeral 2.5 - 5.0' wide - North side - Baker Creek Tributaries	5,171
Stream Channel	Ephemeral 6 - 15' wide - North Side	13,037
Stream Channel	Ephemeral >16' wide - North Side	14,359
Stream Channel	Ephemeral 0.5 - 2.0' wide South Side	22,690
Stream Channel	Ephemeral 2.5 - 5.0' wide - South Side	49,968
Stream Channel	Ephemeral 6 - 15' wide - South Side	37,535
Stream Channel	Ephemeral >16' wide - South Side	NONE
Stream Channel	Intermittent - NSR - downstream of dam (FM 904)	6,387
Stream Channel	Intermittent – NSR – upstream of pool (FM 38)	3,689
Sub-Total Outside Conservation Pool, Embankment, Spillway of LRH		**189,860**
Total Stream Channel Length for 13,094-Acre Assessment Area		**690,918**

Ref: Table 1 of the SJD Report; detailed listing of stream channels provided in Table A-1 included in Appendix A of the SJD Report, SJD Report included in Mitigation Plan, Appendix B.

On-Channel Impoundments			
Location	**Number**	**Acres**	**Fringe Wetland Area (Acres)***
Within Conservation Pool, Dam, Spillway Area	33	56.19	8
Outside Conservation Pool, Dam, Spillway Area	14	13.69	2
Total	**47**	**69.89**	**10**

**Fringe wetland area included in total acreage of on-channel impoundments.*
Ref: Table 2 of the SJD Report; detailed listing of on-channel impoundments provided in Table A-2 included in Appendix A of the SJD Report; SJD Report included in Mitigation Plan, Appendix B.

The proposed project would involve the construction of a water supply reservoir (LRH) on the NSR. With a conservation pool elevation of 551 feet, the reservoir would inundate approximately 7,568 acres. Permanent impacts to waters of the U.S. would result from the construction of the dam and its attendant features (primary and emergency spillways, and raw water intake and pump station). With the dam in place, the resulting impoundment of the NSR, its tributaries, and existing impoundments of tributaries up to elevation 551 feet would occur.

In addition to construction of the dam and its attendant features, multiple roads would be impacted by the proposed project. The impacted roads which would involve potential fill activities within delineated stream channels include: State Highway (SH) 34, Farm to Market (FM) Road 1550, and County Roads (CR) 3380, 3395, 3444, and 3640. The modification of CR 3443 would not involve any impacts to waters of the U.S. Road realignments or improvements would result in the placement of piers and culverts within the NSR and tributaries to Merrill Creek, respectively. Pier and culvert design would consider natural channel characteristics to provide optimal life spans. All proposed road work outside of the conservation pool would involve the re-designation and/or improvement of existing roadways. Any improvements outside of existing road right-of-ways would not involve any impacts to waters of the U.S.

In addition to the construction of the various components for the proposed lake discussed previously, proposed mitigation activities would also require the placement of structures and vegetation to facilitate bank stability and improved/enhance habitat features. These structures would be placed within created, restored and enhanced channels in the aquatic resources mitigation areas downstream of the dam. These structures may consist of any of the following: cross vanes, log/rock vanes, j-hook vanes, w-weirs, or similar stabilization measures. A description of typical in-stream structures is provided in Appendix E. Also, in applicable areas, vegetation would be added to the stream bank for added stabilization purposes. The specific locations of these measures (instream structures and vegetation) would be determined during detailed design. The structures and vegetation would be designed for aquatic habitat restoration, enhancement, and establishment. Specifically, the structures and vegetation employed would provide stream slope stabilization and in-stream habitat features. It is anticipated that these structures would be constructed using large woody debris (LWD) harvested from the project site

as a result of construction activities. Incorporating these features would not result in the loss of any stream channel functions or stream channel length. Also, the proposed channel creation would be located in uplands or along isolated or severely eroded channel segments. The loss of existing stream channel segments (filled and replaced with the created channels) was included in the mitigation calculations detailed in Tables G-1 and G-2, included in Appendix G.

Downstream of the dam, the exposed shale within the NSR would need to be covered to deter the continued erosion within the channel and to protect the integrity of the dam. Earthen fill associated with rehabilitation of the river channel including creation of a down-sized, meandering channel and functioning floodplain between the LRH dam and the confluence of Baker Creek is proposed as one of the mitigation activities. A transition structure would also be constructed in association with the proposed rehabilitation of the existing NSR Main Channel. This structure would transition the restored NSR Main Channel to the existing river channel upstream of the confluence with Baker Creek. Further description of this transition structure is provided in III.A.6.

Summary of Fill Materials for Proposed Reservoir Project

Project activities involving the addition of fill material to waters of the U.S. would include the construction of the dam embankment across the NSR; piers for the Highway 34 bridge; culverts for FM 1550 and County Roads 3380, 3395, 3444, and 3640; the stabilization and modification of the NSR Main Channel; restoration measures associated with the former NSR channel downstream of the dam and the tributaries to this channel; and stabilization of tributaries of the NSR upstream of the proposed dam.

The proposed dam embankment across the NSR would be comprised of native soils obtained from an area adjacent to the dam location. The face of the dam would be armored with large diameter rock riprap or roller compacted concrete. A concrete uncontrolled primary spillway would be constructed to convey flood flows up to the 100-year flood to the NSR Main Channel downstream of the LRH dam. An earthen emergency spillway would be constructed north of the existing NSR Main Channel to convey floodwaters downstream toward Baker Creek. Flows above the 100-year flood frequency would engage the emergency spillway and both spillways

would then be utilized to pass the flood. An additional low-flow pipe outlet with a gate tower would be installed to provide means for passing flows through the dam.

Fill activities associated with the restoration of the former NSR channel would include fill of channelized and/or severely eroded channel segments and grading to develop a contiguous, meandering channel with stable side slopes and appropriate channel gradient. Construction of instream structures may also involve fill but would primarily be built using logs and other LWD. Typically, instream structures, such as logs and other LWD, used for stream restoration or enhancement purposes do not require compensatory mitigation since these activities result in net increases in aquatic resource functions and services. Specific locations of in-stream grade stabilization structures would be determined during detailed design.

Modification of the NSR Main Channel downstream of the proposed Leon Hurse Dam would also involve regrading of the side slopes and earthen fill of the severely eroded channel to cover the shale bedrock. A meandering channel (specific channel geometry to be determined during detailed design) would be created and the earthen fill within the reclaimed floodplain planted with woody and herbaceous vegetation to promote stabilization and establish a wooded riparian corridor. Additional fill would be required for the construction of a transition structure upstream of the confluence of Baker Creek with the NSR Main Channel. The type and quantity of fill for each of the associated project components would be determined during detailed design.

3. Summary of Impacts to Aquatic Resources Resulting from Implementation of Pipeline Alternatives

Waters of the U.S. within the Proposed Preferred Pipeline Alternative

In general, through the preliminary routing study, the preferred pipeline route would avoid and minimize impacts to aquatic resources to the extent practicable. Significant treed areas associated with riparian zones would be avoided to minimize habitat fragmentation, as well as to avoid potential forested wetlands. At proposed stream crossings, the pipeline alignment would be sited to cross the stream as close to perpendicular as possible. Permanent, adverse impacts to aquatic resources would not be anticipated with the installation of the pipeline. Stream channels disturbed by proposed pipeline construction activities would be restored to pre-construction

contours. Reestablishment of vegetative cover would be conducted along the pipeline alignment to include stream crossings.

To document conditions of aquatic resources along the proposed pipeline route, an on-site investigation of the preferred pipeline route was performed on January 18-20, 2012. The investigation documented the up and downstream conditions of stream channels at the proposed pipeline crossings where roadside access was available. Aerial photography from the National Agricultural Imagery Program (NAIP) year 2016 was reviewed to determine any changes along the alignment since the 2012 site investigation.[19] The following narrative details the findings from the investigation.

Chapman Lake (Irving) Pipeline Alternative (Route Alternative Number 4)

The Irving Pipeline Alternative would be approximately 32 miles long located within a proposed 100 feet width corridor traversing portions of Fannin, Hunt, and Collin Counties. The pipeline corridor width would occupy approximately 371 acres. Land uses along the proposed pipeline corridor are dominated by cropland and pasture, which together represent approximately 73 percent of the pipeline corridor. The remaining land uses within the pipeline corridor are represented by developed areas (roads and/or other infrastructure), wooded areas (both young and mature woods), and partially wooded grasslands.

The proposed pipeline would originate in the Sulphur River Basin at the proposed LRH and cross the upper portion of the Sabine River Basin before terminating in the East Fork Trinity River Basin at the existing Chapman Lake (Irving) Pipeline. Raw water from LRH would then be conveyed through the existing Chapman Lake Pipeline. Specifically, the proposed pipeline would encounter the following hydrologic unit codes: 11140301 associated with the Sulphur River, 12010001 associated with the Sabine River, and 12030106 associated with the East Fork Trinity River. This route was prepared in a way that would limit environmental impacts by avoiding and minimizing impacts to heavily wooded areas and surface water features. Table 2 shows the results of the surface water assessment for this pipeline route alternative based on a

[19] National Agricultural Imagery Program (NAIP) for Fannin County, Texas – imagery flown 4 July 2016 to 6 December 2016.

100-foot right of way outside of the reservoir assessment area. Refinement of the proposed alignment along the east side of the proposed Leon Hurse Dam further minimized impacts to aquatic resources through reduction of number of stream crossings required. Figure A-2 in Appendix A shows the preferred Chapman Lake (Irving) Pipeline Alternative (Route Alternative Number 4) with land uses assessed from the 2016 NAIP aerial imagery.

TABLE 2: POTENTIAL RESOURCE IMPACTS IDENTIFIED FOR CHAPMAN LAKE (IRVING) PIPELINE ALTERNATIVE (ROUTE ALTERNATIVE NUMBER 4)

Description	Number	Linear Feet	Acres***
Streams	34	4,305	1.0
Impoundments	4	NA	2.0
Stock Tanks/Upland Ponds	25	NA	3.0

*Permanent impacts to stream channels or upland ponds would not be anticipated.
**Pipeline alignments assessed based on preliminary route studies and do not include alignment refinements that would occur during detailed design to further avoid and/or minimize impacts to waters of the U.S.
***Based on a 100 feet right of way and centerline of stream channels of variable widths.
Note: Assessment area for pipeline terminated at reservoir assessment area boundary. Ref: Figure A-2 in Mitigation Plan, Appendix A.

4. Goals and Objectives of Aquatic Resource Mitigation Plan

The principal goal of the mitigation plan is to provide compensation for impacts to existing functions of aquatic resources resulting from the impoundment of water following construction of the proposed Leon Hurse Dam and its associated appurtenances, and construction of the raw water conveyance pipeline. Another objective for the mitigation activities would be to provide aquatic resource compensation within the NSR watershed in close proximity to the proposed project. A final objective of the project, and not specifically quantified in this mitigation plan, although still constituting a mitigating activity, would be to curb exacerbated erosion of tributaries to the NSR upstream of the proposed Leon Hurse Dam.

Based on the proposed mitigation actions outlined hereafter, mitigation activities would replace aquatic functions within the project watershed area such that no net loss of aquatic functions is achieved. Further, it is anticipated that a net gain of functions for aquatic resources would be realized. Key goals of the proposed aquatic resource mitigation are as follows:

- Creation of a large contiguous, protected mitigation area with restored and enhanced functioning stream channels, riparian habitat, and functioning floodplains downstream of the Leon Hurse Dam;
- Improvement of stream bank stability and the addition of stream slope vegetation and instream structures;
- Reduction of in-channel erosion through installation of stabilization measures;
- Improvement of watershed and stream channel hydrology; and
- Restoration of stream channel hydraulic connection to floodplains.

Accordingly, the proposed mitigation plan focuses on functional restoration and enhancement activities for the identified aquatic resources within the mitigation boundary downstream of the proposed Leon Hurse Dam site, which includes areas between the dam and Baker Creek and FM 904, as identified in Figure A-4 included in Appendix A.

A list of quantitative and/or qualitative measurable outcomes resulting from the proposed mitigation activities includes, but is not limited to the following:

1. Restoration/creation of approximately 19,200 linear feet of the former NSR downstream of the Leon Hurse Dam.
2. Creation of approximately 8,800 linear feet of a meandering base flow channel within the existing NSR Main Channel.
3. Development of over 900 acres of hydrologically connected bottomland hardwood ecosystems which would be a combination of bottomland hardwoods and riparian buffer.
4. Restoration, creation, and enhancement of approximately 58,000 linear feet of ephemeral tributary channels which would convey flow to the restored former NSR channel and ultimately to the NSR Main Channel.
5. Restoration and creation of approximately 22,400 linear feet of ephemeral tributary channels which would convey flow to the created base flow channel for the NSR Main Channel.
6. Enhancement of approximately 6,900 linear feet of ephemeral tributary channels which would convey flow to Baker Creek.

5. Baseline Information for Aquatic Resources in Mitigation Area

Current Conditions of Aquatic Resources Based on SWAMPIM Assessment

Functional capacity (FC) scores were developed, based on the SWAMPIM assessment, to estimate the functional value of the hydrology, habitat and water quality of the streams in the Assessment Area to aquatic organisms. On September 16, 2009, the cooperating agencies review team (CRT) performed a field review of numerous sites within the project boundary to review and comment on the collected data for aquatic and terrestrial resources.[20] The pre-project stream Functional Capacity Units (FCU) based on the agency reviewed Functional Capacity Index (FCI) scores[21] and linear feet of jurisdictional streams[22] for the aquatic resources within Assessment Area that will be impacted by the proposed LRH are summarized in Table 3. The SWAMPIM datasheets for representative streams and ponds, updated to reflect nomenclature used in the June 21, 2017 SJD and approved by the USACE July 27, 2017, are included in Appendix C-2 along with summary tables. Permanent impacts to aquatic resources will occur within the conservation pool, dam and spillway area and will therefore require compensatory mitigation. No impacts to aquatic resources are anticipated to occur within the area above the conservation pool up to the Project Boundary at approximate elevation 560' msl. Impacts to aquatic resources downstream of the dam due to mitigation activities within the Proposed Mitigation Boundary are addressed later in this chapter.

[20] Attendees involved with the field review included representatives from the USACE, USFWS, USEPA, TPWD, TCEQ, UTRWD, CPYI, CH2M, and APAI.

[21] Technical memorandum to Mary Verwers, USACE dated November 10, 2009 – *Summary of SWAMPIM and WHAP Data Sets and Reports for the Proposed Lake Ralph Hall Project Site*

[22] Stream length based on the linear feet of streams documented in the SJD and affirmed in the AJD.

TABLE 3: PRE-PROJECT FUNCTIONAL CAPACITY FOR STREAMS WITHIN LRH CONSERVATION POOL, EMBANKMENT, AND SPILLWAY[1]

Category	Description[2]	L.F.[3]	FCI[4]	Multiplication Factor[5]	FCU[6]
Stream Channel	Ephemeral 0.5 - 2.0' wide North Side	26,835	0.70	0.00125	23
Stream Channel	Ephemeral 2.5 - 5.0' wide - North Side	88,309	0.95	0.00125	105
Stream Channel	Ephemeral 6 - 15' wide - North Side	55,023	0.45	0.00125	31
Stream Channel	Ephemeral >16' wide - North Side	82,713	0.55	0.00125	57
Stream Channel	Ephemeral 0.5 - 2.0' wide South Side	19,769	0.62	0.00125	15
Stream Channel	Ephemeral 2.5 - 5.0' wide - South Side	66,967	0.79	0.00125	66
Stream Channel	Ephemeral 6 - 15' wide - South Side	92,155	0.65	0.00125	75
Stream Channel	Ephemeral >16' wide - South Side	13,717	0.50	0.00125	8
Stream Channel	Intermittent - NSR	55,570	0.35	0.00250	49
Total Channel Function Capacity Units (FCUs)		**501,058**	**---**		**430**

Notes for Table 3:

1. Aquatic resources impacted by proposed reservoir components.

2. Stream width range at ordinary high water mark (OHWM). OHWM defined as the projected line of scour along a stream channel where the channel is typically void of vegetation. Stream OHWM used for stream classification.

3. Stream lengths from June 21, 2017 SJD report approved by USACE in letter dated July 27, 2017 (Ref: Mitigation Plan Appendix B).

4. FCI average values from SWAMPIM assessment of multiple representative streams for each category as field reviewed by coordinating agencies and documented in technical memorandum dated November 10, 2009 (Ref: Mitigation Plan Appendix C-2; Ref. Mitigation Plan Appendix C-1 for SWAMPIM Protocol documentation.)

5. Multiplication Factor for stream segment. Perennial = 0.00380; Intermittent = 0.00250; Ephemeral = 0.00125. Ref: Mitigation Plan Appendix C-1 - SWAMPIM Protocol Documentation

6. FCU = L.F. X FCI X Multiplication Factor

In addition to identified streams, approximately 33 on-channel impoundments totaling 56.19 acres were identified within the proposed conservation pool area for LRH. Approximately 8 acres (included within the total 56.19 acres) of lacustrine fringe wetlands were identified associated with these 33 on-channel impoundments.

Above the proposed conservation pool but within the project area, an additional 14 on-channel impoundments were identified totaling approximately 13.69 acres. Approximately 2 acres (included within the total 13.69 acres) of lacustrine fringe wetlands were associated with these 14 on-channel impoundments. These aquatic resources were assessed separately using the SWAMPIM protocol for impoundments to determine the current impoundment resource capacity (RC). Table 4 summarizes the current conditions and calculations of impoundment RCs.

TABLE 4: EXISTING RESOURCE CAPACITY FOR ON-CHANNEL IMPOUNDMENTS WITHIN THE LRH ASSESSMENT AREA[1]

Impoundments Within Conservation Pool of Lake Ralph Hall

Category	Number[2]	Total Area[3] (Acres)	Fringe Wetland Area (Acres)[4]	RCI	Mult. Factor	RCUs[5]
Small Ponds <1 acre	22	8.06	1.2	0.28	1.5	3.4
Ponds >1 acre <5 acres	9	16.36	2.3	0.30	1.3	6.4
Lakes >5 acres <500 acres	2	31.78	4.5	0.54	1.1	18.9
SUBTOTAL	33	56.20	8.0			28.6

Impoundments Outside Conservation Pool of Lake Ralph Hall

Category	Number[2]	Total Area[3] (Acres)	Fringe Wetland Area (Acres)[4]	RCI	Mult. Factor	RCUs[5]
Small Ponds <1 acre	10	3.86	0.6	0.28	1.5	1.6
Ponds >1 acre <5 acres	4	9.84	1.4	0.30	1.3	3.8
Lakes >5 acres <500 acres	0					
SUBTOTAL	14	13.70	2.0			5.5
TOTAL	**47**	**69.90**	**10.0**			**34.1**

Notes for Table 4:

1. Assessment Area of 13,094 acres includes Project Boundary at approximately 560' msl elevation upstream of proposed dam and preliminary mitigation boundary downstream of dam.

2. Number of impoundments from June 21, 2017 SJD report approved by USACE in letter dated July 27, 2017 (Ref: Mitigation Plan Appendix B).

3. Acreage of impoundments from June 21, 2017 SJD report approved by USACE in letter dated July 27, 2017 (Ref: Mitigation Plan Appendix B).

4. Acreage of fringe wetland area from June 21, 2017 SJD report approved by USACE in letter dated July 27, 2017 (Ref: Mitigation Plan Appendix B)

*5. Resource Capacity calculated based on average Resource Condition Index (RCI) * (Total Acreage of All Impoundments in Category)*Multiplication Factor. RCIs based on assessment of representative impoundments for each size category for physical, watershed/management, biological, and water quality variables; total score for each impoundment divided by 100 (the maximum total score possible), then RCIs for all representative impoundments in each category are totaled then total divided by number of impoundments to determine average RCI score. Impoundment categories and multiplication factors are: small pond ≤ 1 acre (1.5); pond >1 but ≤5 acres (1.3); lake >5 but ≤500 acres (1.1); reservoir >500 acres (1.04). (Ref: Mitigation Plan Appendix C).*

6. Mitigation Work Plan for Aquatic Resources

To compensate for impacts to aquatic resources resulting from the construction of the Leon Hurse Dam, its appurtenances (raw water intake structure, primary and emergency spillways), and the resulting impoundment of approximately 7,568 acres at conservation pool, as well as impacts to aquatic resources resulting from pipeline and road crossings of streams, the proposed mitigation plan would include elements to restore, create, and enhance stream channels, increase channel stability, improve water quality, enhance aquatic habitat for both aquatic and terrestrial species, and provide contiguous riparian corridors. Mitigation activities proposed would include the following:

- Restoring/creating approximately 19,200 linear feet of the former NSR channel within the mitigation boundary downstream of the proposed Leon Hurse Dam;
- Restoring, creating, or enhancing approximately 58,000 linear feet of ephemeral tributary channels which convey watershed runoff to the restored former NSR channel downstream of the dam;
- Restoring or creating approximately 22,400 linear feet of ephemeral tributary channels which convey watershed runoff directly to the NSR Main Channel downstream of the proposed Leon Hurse Dam;
- Enhancing approximately 6,900 linear feet of ephemeral tributary channels which convey watershed runoff to Baker Creek upstream of its convergence with the NSR Main Channel;
- Creating approximately 8,800 linear feet of intermittent stream channel within the NSR Main Channel downstream of the proposed Leon Hurse Dam to just upstream of the confluence of Baker Creek at FM 904;
- Establishing appropriate vegetative cover in wooded riparian corridors along all channels within the downstream mitigation boundary as well as herbaceous vegetative cover to stabilize banks; and
- Implementation of positive measures to prevent uncontrolled access from outside the aquatic mitigation boundary.

As previously described in Section I of this Proposed Mitigation Plan, streams throughout the upper reaches of the Sulphur river watershed within the Blackland Prairie Ecoregion have been substantially altered as a result of levee construction and channelization to support agricultural production. As a consequence of these historical activities and the underlying geology documented in the geomorphology report[23], stream conditions, especially within the North Sulphur River watershed to include the LRH project area, are extraordinarily unique.

In 2012, field investigations were conducted to identify streams within the NSR, Middle Sulphur River, and South Sulphur River watersheds in an attempt to locate a reference site that could be used for the proposed LRH mitigation design. No appropriate reference sites that would qualify as a "least-disturbed stream" were located. Since a reference site was not available, mitigation design concepts were developed based on the physical dimensions of remnant former NSR channel segments within the proposed project area that are no longer hydraulically connected (i.e., do not currently function as tributaries to the existing NSR). These isolated remnants have not been adversely affected by the significant erosion characteristic of the channels that are hydraulically connected to the channelized NSR. Descriptions of historical conditions prior to the NSR channelization project were also considered in the development of design parameters for the proposed creation and restoration of stream channels within the downstream aquatic resources mitigation boundary described in the following sections as well as review of the SWAMPIM metrics. The SWAMPIM metrics were developed from field-tested assessment protocols in use at the time and are based on fluvial geomorphic principles that evaluate hydrologic, biogeochemical, and habitat functions of aquatic resources. The projected functional uplift for the aquatic resources within the downstream aquatic resources mitigation boundary, as detailed in Tables G-1 and G-2, included in Appendix G, are considered realistic based on the proposed mitigation activities, hydrologic modeling, and preliminary design.

[23] Mussetter Engineering, Inc. *Geomorphic and Sedimentation Evaluation of North Sulphur River and Tributaries for the Lake Ralph Hall Project.* October 23, 2006.

South Mitigation Area Downstream of Leon Hurse Dam – Restoration of Former NSR and Tributaries (refer to Figures A-5, A-6 and A-7 included in Appendix A)

Downstream of the proposed LRH dam, remnants of the former NSR channel exist south of the channelized NSR. The UTRWD proposes to reestablish a stable, complex stream ecosystem by:

1. Grading to restore and/or create approximately 19,200 linear feet of contiguous, meandering base flow channel with stable side slopes appropriately sized to allow overbanking to its created floodplain valley at a 1.5 to 2 year frequency to develop a functioning complex stream system reproducing an intermittent stream with perennial pools (referred to as the "restored former NSR channel");
2. Grading to restore and/or create approximately 27,300 linear feet of contiguous, meandering tributary channels with stable side slopes within created floodplain valleys to develop ephemeral stream systems functioning as tributaries to the restored former NSR channel (Item #1 above);
3. Enhancement of approximately 30,700 linear feet of existing tributary channels to the restored former NSR channel (Item #1 above) with installation of in-stream structures and riparian plantings;
4. Filling existing fragments or severely eroded segments of the former NSR channel which do not form a contiguous channel. Existing standing woody vegetation within the fragments to be filled will be harvested and those of appropriate size will be used for in-stream structures.
5. Planting native tree and shrub species to establish wooded riparian corridors and on-bank plantings for bank stabilization along the restored/created former NSR channel and the existing restored, created, and enhanced tributary channels;
6. Planting of native prairie grasses, legumes, and forbs to further establish a habitat mosaic that increases diversity and habitat function;
7. Stocking of native fish species; and
8. Monitoring to ensure restoration success.

The original restoration concept for the former NSR channel, as cited in the TCEQ Water Use Permit for LRH is provided in the document titled *Conceptual Design and Analysis of the Proposed North Sulphur River Riparian Habitat Mitigation Area for Lake Ralph Hall.*[24] Based on further studies of the former NSR channel fragments located in the area downstream of the proposed Leon Hurse Dam and FM 904, the restoration concept was updated. Figures A-5 and A-6 in Appendix A show the proposed former NSR restoration project in plan view and proposed typical channel cross-sections respectively.

Runoff from the drainage area (approximately 1,976 acres) located below the proposed dam will pass through the restored former NSR channel. This runoff would travel within a restored bankfull channel that would be approximately 15 to 25 feet in top width (six feet bottom width) below the stilling basin to approximately 50-60 feet in top width (25 feet bottom width) at the confluence with the restored NSR Main Channel upstream of a proposed transition drop structure (refer to Figure A-5 included in Appendix A). The restored channel would vary in width and meander within a floodplain valley.[25] These flows would vary seasonally in a natural pattern depending on the duration and intensity of rainfall across the watershed. These variations would emulate a natural stream system with variations in flow depths. Hydrologic/hydraulic modeling analyses were conducted by Robert J. Brandes Consulting to determine frequency of overbanking due to flows for different flood frequencies. Results of these analyses were documented in a technical memorandum dated August 11, 2017 and included in Appendix F.

The updated hydrologic/hydraulic analysis involved the determination of peak flood flows, depths and velocities at selected locations along the restored former NSR channel for a range of flood events based on the revised alignment and geometry for the restored channel developed during preliminary design. The modeling results indicate that the bankfull channel would convey flows with some overbanking occurring in the lower reach of the channel for the 1-year storm and overbanking projected along the majority of the channel for the 2-year storm event. Channel velocities range from about 1.0 to 5.0 feet per second (fps) for the 1-year storm event and 1.0 to 6.5 fps for the 100-year storm event. Overbank velocities are lower, ranging from about 0.1 fps

[24] CPY, Inc., Alan Plummer Associates, Inc., and R.J. Brandes Company. *Conceptual Design and Analysis of the Proposed North Sulphur River Riparian Habitat Mitigation Area for Lake Ralph Hall*. March 18, 2010.
[25] Specific bankfull channel widths, lengths, and geometries would be defined during detailed design

to 1.4 fps. Flows from more intense storms would provide overbanking into the created floodplain. To determine the degree of runoff from the sub-watersheds, the updated analysis used projected land cover based on the proposed mitigation plantings to create, supplement and/or enhance existing forested areas.

In addition to the restoration/creation of the former NSR channel, tributaries to this channel would be enhanced, created, and/or restored. Currently, there are four main tributaries that collect and convey water to channel remnants of the former NSR: eastern tributary, two channelized central tributaries, and a western tributary. These tributaries are located to the south of the existing former NSR channel remnants. The eastern tributary collects flow from east of FM 904, conveying flows beneath FM 904, and contributes flow to a remnant section of the former NSR channel. This tributary channel would be captured at the proposed aquatic resources mitigation boundary near FM 904 and lengthened through the establishment of a meandering channel and floodplain valley. The eastern, central channelized tributary would also be modified to create a longer, meandering channel and floodplain valley to a stable confluence with the restored former NSR channel. The western, central channelized tributary would likewise be captured, moved, and lengthened through establishment of a meandering channel and floodplain valley created to a stable confluence with the restored former NSR channel. The western-most tributary is relatively undisturbed; however, it would require design of a transition zone to the restored former NSR channel so that it and the confluence with the restored NSR remain stable. North of the restored former NSR channel, drainage modifications would be required to protect the restored NSR from potential bank failures due to the proximity of the NSR Main Channel. As proposed, grades north of the restored former NSR would be modified to provide drainage toward the restored former NSR in lieu of its current flow path which is to the existing channelized NSR Main Channel. By modifying the topography north of the restored former NSR channel, an opportunity exists to create two tributaries that would convey flow to the restored former NSR channel. The reason for creating these tributaries is to purposefully convey flow away from the channelized NSR Main Channel. A conceptual figure showing the proposed restored former NSR, its southern, restored contributing tributaries and northern, created tributaries is included as Figure A-7 in Appendix A.

In-channel structures are proposed to be incorporated within the restored former NSR channel and its restored/created and enhanced tributaries for grade control to achieve an overall gradient of 0.001 feet per foot, or 0.1 percent slope, as well as slope erosion control measures. These structures may include rock and/or wood cross-vanes, rootwads, and vegetation to provide channel stability as well as water quality and habitat improvement functions. Descriptions and illustrations of typical in-channel structures are provided in Appendix E. Cross-vanes would be constructed where necessary to provide grade transitions or to provide channel flow training where applicable. Downstream of the cross-vane structures, pools within the channel would be created to provide channel variability. In addition to pool creation, riffles and runs would be included to provide aeration opportunities as well as habitat variability. Along meander bends, rootwads may be keyed into channel banks to provide enhanced channel structure and catchment areas for allochthonous material as well as channel training and bank protection. An ancillary benefit of the rootwads would be the addition of habitat and cover for aquatic fauna generated within eddy pools located immediately downstream of the rootwads. During detailed design, the inclusion of engineered logjams, log vanes, j-hooks, weirs, revetments, or toe logs would be considered.

In addition to enhanced in-channel functions, the aquatic resources mitigation area downstream of the dam would be planted with a variety of tree and shrub species along the restored former NSR and its tributaries to create an enhanced riparian corridor a minimum of 60 feet wide along each side of an appropriate meander belt width. Proposed vegetation for enhancement and restoration of forested riparian corridors in the downstream aquatic resources mitigation boundary is listed in Table 5.

TABLE 5: RIPARIAN TREES, SMALL TREES AND SHRUB SPECIES FOR AQUATIC RESOURCES MITIGATION

Strata	Common Name	Scientific Name	Planted (P) vs. Native Colonization (NC)
Canopy Tree	Bur Oak	*Quercus macrocarpa*	P/NC
	Water Oak	*Quercus nigra*	P/NC
	Willow Oak	*Quercus phellos*	P/NC
	Post Oak	*Quercus stellata*	P(acorns)/NC
	Blackjack Oak	*Quercus marilandica*	NC
	Pecan	*Carya illinoensis*	P/NC
	Black Walnut	*Juglans nigra*	P/NC
	Shumard Oak	*Quercus shumardii*	P/NC
	Chinkapin Oak	*Quercus muhlenbergii*	P/NC
	Shagbark Hickory	*Carya ovata*	P/NC
	Sycamore	*Plantanus occidentalis*	P/NC
	American Elm	*Ulmus americanus*	P/NC
	Cedar Elm	*Ulmus crassifolia*	P/NC
	Winged Elm	*Ulmus alata*	P/NC
	Slippery Elm	*Ulmus rubra*	P/NC
	Bois d'Arc	*Maclura pomifera*	P/NC
	Green Ash	*Fraxinus pennsylvanica*	NC
	Texas Ash	*Fraxinus texensis*	P/NC
	Sugarberry	*Celtis laevigata*	NC
	Eastern Cottonwood	*Populus deltoides*	NC
	Gum Bumelia	*Sideroxylon lanuginosum*	NC
	Black Willow	*Salix nigra*	NC
	Box Elder	*Acer negundo*	NC
	Honey Locust	*Gleditsia triacanthos*	NC
	Eastern Red Cedar	*Juniperus virginiana*	NC
Small Tree and Shrub	Rusty Blackhaw	*Viburnum rufidulum*	P/NC
	Eve's Necklace	*Sophora affinis*	P/NC
	Red Mulberry	*Morus rubra*	P/NC
	Coralberry	*Symphoricarpos orbiculatus*	P/NC
	Eastern Redbud	*Cercis canadensis*	P/NC
	Mexican Plum	*Prunus mexicana*	P/NC
	Chickasaw Plum	*Prunus angustifolia*	NC
	Rough-leaf Dogwood	*Cornus drummondii*	P/NC
	Common or Texas Persimmon	*Diospyros virginianum or D. texana*	P/NC
	Deciduous Holly	*Ilex decidua*	P/NC
	American Beautyberry	*Callicarpa americana*	P/NC
	Swamp Privet	*Forestiera acuminata*	P/NC
	Buttonbush	*Cephalanthus occidentalis*	P/NC

The objective of enhancement plantings within the protected riparian corridors would be to plant sufficient densities of selected native vegetation to facilitate achieving a minimum density of 200 woody stems per acre seven (7) years after the last (initial or remedial) plantings are performed. Toward achieving the goal of establishing a minimum of 200 woody stems per acre, volunteer species would count, but no one species could exceed 25 percent of total stems per acre.

A target of 200 woody stems per acre is based on tree density surveys conducted March 22-23, 2017 within 57 plots located in riparian wooded areas across nine (9) locations within the proposed project boundary. Woody stems (> 4" dbh) within individual circular plots (50 feet in diameter) were counted. A map of the locations (Figure A-8) and table documenting the results of the tree density survey is provided in Appendix A. The density of woody stems for the nine locations ranged from an average of 111 to 311 stems per acre with an overall average for the 57 plots of 202 stems per acre and a median of 177 stems per acre. The data collected within the proposed LRH project area were compared to woody stem density data published in the final report "Modifying the East Texas HGM for the Lower Bois D'Arc Creek Reservoir Project." The *Modifying the East Texas HGM for Lower Bois D'Arc Creek Reservoir* report included density data for 15 plots surveyed within four locations in the Bonham Unit of the U.S. Forest Service (USFS) Caddo National Grasslands.[26] Although the Bonham Unit is located within the East Central Texas Plains Ecoregion rather than the Blackland Prairie Ecoregion of the proposed LRH project, due to the proximity of the sites the information presented was considered to be relevant to the LRH project. The data from the four locations in the Bonham Unit indicated a range of 71 to 192 woody stems per acre with an average of 116 stems per acre. Based on the reported woody stems per acre for the Bonham Unit and the data collected within the LRH project boundary, 200 woody stems per acre was determined to be an appropriate target for the proposed riparian corridors along the stream channels within the LRH aquatic resources mitigation boundary.

In addition to the woody species, herbaceous species would also be planted within the riparian corridors to provide vegetative cover within the understory to further stabilize soils of the restored/created grades. Native herbaceous species for planting within riparian corridors are listed in Table 6. Vegetative cover of herbaceous species within the riparian corridors should achieve a minimum of 80 percent cover within five years following last (initial or remedial) seeding activity.

[26] *Modifying the East Texas HGM for Lower Bois D'Arc Creek Reservoir* reported the sites as being in the Ladonia Unit of the Caddo National Grasslands. Upon review of the locations based on the coordinates provided within the report, it was determined that the plots used in the HGM study were within the Bonham Unit located in northern Fannin County instead of the Ladonia Unit.

TABLE 6: HERBACEOUS SEED MIXTURE FOR RIPARIAN CORRIDORS WITHIN AQUATIC RESOURCES MITIGATION BOUNDARY

Type	Common Name	Scientific Name
Grasses	Sideoats Grama	*Bouteloua curtipendula*
	Eastern Gamagrass	*Tripsacum dactyloides*
	Switchgrass	*Panicum virgatum*
	Big Bluestem	*Andropogon gerardii*
	Prairie Wildrye	*Elymus canadensis*
	Virginia Wildrye	*Elymus virginicus*
	Green Sprangletop	*Leptochloa dubia*
	Indiangrass	*Sorghastrum nutans*
	Inland Seaoats	*Chasmanthium latifolium*
	Plains Bristlegrass	*Setaria vulpiseta*
	Florida Paspalum	*Paspalum floridanum*
	White Tridens	*Tridens albescens*
	Bushy Bluestem	*Andropogon glomeratus*
	Sand Dropseed	*Sporobolus cryptandrus*
	Cane Bluestem	*Bothriochloa barbinodis*
	Texas Cupgrass	*Eriochloa sericea*
	Texas Wintergrass	*Nassella leucotricha*
Legumes	Illinois Bundleflower	*Desmanthus illinoensis*
	Partridge Pea	*Chamaecrista fasciculata*
Forbs	Scarlet Sage	*Salvia coccinea*
	Frostweed	*Verbesina virginica*
	Cutleaf Daisy	*Engelmannia pinnatifida*
	Plains Coreopsis	*Coreopsis tinctoria*
	Maximilian Sunflower	*Helianthus maximiliani*
	Black-eyed Susan	*Rudbeckia hirta*
	Lemon Mint	*Monarda citridora*
	Pink Evening Primrose	*Oenothera speciosa*
	Swamp Sunflower	*Helianthus angustifolius*
	Rose Milkweed	*Asclepias incarnata*
	Frostweed	*Verbesina virginica*
	Tall Goldenrod	*Solidago altissima*
	Giant Goldenrod	*Solidago gigantea*
	Tall Aster	*Symphyotrichum praealtum*
	Clasping Coneflower	*Dracopis amplexicaulis*
	Cardinal Flower	*Lobelia cardinalis*
	Buttonbush	*Cephalanthus occidentalis*
	Redwhisker Clammyweed	*Polanisia dodecandra*
	Turk's Cap/Wax Mallow	*Malvaviscus arboreus*

Note - Seed mixture is from Native American Seed – Riparian Recovery Mix with minor modifications; some variation may occur based on seed availability for individual species.

North Mitigation Area Downstream of Leon Hurse Dam

North of the NSR Main Channel between the proposed Leon Hurse Dam and Baker Creek is the emergency spillway area. Only minimal grading along the crest of the topographic divide between the Merrill Creek and Baker Creek drainages will be required in this area to develop the emergency spillway system. Therefore, an opportunity exists to enhance, restore, and create natural drainages to the NSR Main Channel and enhance tributaries draining to Baker Creek. Proposed mitigation activities include restoration and creation of tributary channels where historical agricultural activities have filled former drainages to develop cropland, and improved pasture, and erosional features have been impounded to create upland ponds. Approximately 22,400 linear feet of tributary channels draining to the NSR Main Channel would be created or restored. An additional approximately 6,900 linear feet of existing tributary channels draining to Baker Creek would be enhanced. Wooded riparian corridors would be established and/or enhanced along the tributaries draining directly to the NSR Main Channel and those draining to Baker Creek through plantings of desirable woody species listed in Table 5. Native prairie species (as listed in Table 6) would be seeded to establish herbaceous understory cover within the riparian corridors.

NSR Main Channel Downstream of Leon Hurse Dam to Confluence of Baker Creek

Erosion control within the NSR Main Channel downstream of the dam is critical to protect the integrity of the dam. As described in Section I.B, where the shale is exposed in the bed and banks of the river channel, the exceptional erosion rate due to alternate wetting, drying, slaking, and flushing of the stream bed is expected to continue. The only means to stop erosion within the NSR Main Channel is to cover the exposed shale with some form of protective material – rock, water, or earthen fill.

In reviewing the projected flow rates for discharges from the proposed Leon Hurse Dam, the discharge rates will be less than erosive flows for clay loam soils. Therefore, the most suitable and cost effective cover for the exposed shale would be with earthen fill. The use of earthen fill within the NSR Main Channel offers an opportunity to rehabilitate/restore the NSR Main Channel to a functioning stream channel consisting of a meandering bankfull channel to convey

up to the 2-year frequency flow with larger flows providing overbanking to a planted forested floodplain.

For the restored NSR Main Channel, the proposed mitigation activities include grading the existing almost vertical side slopes of the Main Channel to create stable side slopes of approximately 4:1. The earthen material generated from the grading would be used to bury the exposed shale in the bed and banks of the river channel to a depth of approximately 10 feet. A meandering channel of approximately 8,800 linear feet would be created within this earthen fill. Shallow pools (about 3 feet deep) would be created where the created/restored tributaries drain directly to the NSR Main Channel as well as along meander bends within the channel. The earthen fill outside the meandering channel as well as the graded bank slopes would be planted with woody vegetation to achieve a density of 200 woody stems/acre (refer to Table 5). Herbaceous species (refer to Table 6) would be seeded within the wooded floodplain and along the bank slopes as well. A conceptual rendering of the proposed restoration of the NSR Main Channel is provided as Figure A-9 in Appendix A. A conceptual rendering of the proposed dam and spillway are provided as Figure A-10 included in Appendix A. Based on preliminary hydraulic modeling for the proposed dam and spillway design, discharge velocities to the meandering bankfull channel would range from 3.2 fps for the 1-year frequency storm event to 5.7 fps for the 100-year frequency storm event indicating that the created channel and vegetated floodplain for the NSR Main Channel should not be exposed to erosive velocities.

Where the restored NSR Main Channel transitions to the existing NSR Main Channel (immediately upstream of the confluence with Baker Creek), a grade control structure would be constructed (refer to Figures A-5 and A-9 in Appendix A). The grade control structure will include a central control section that will be located in line with the bankfull channel. The structure will be stepped with its lowest portion located in the stilling basin pool, which will be submerged during significant runoff events. The width and slope of this stepped portion of the chute will be designed with the intention of allowing for occasional aquatic life (e.g., fish) passage when river flows are elevated during significant rain events.

It is anticipated that discharges from the Leon Hurse Dam would occur periodically multiple times per year during normal to wet years with little to no discharges occurring during drought years. However, some direct drainage to the NSR Main Channel river segment between the dam and FM 904 would occur periodically from rain events even during drought years from the approximately 380-acre drainage area north of the river channel and south of the emergency spillway system.

Downstream Aquatic Resources Mitigation Areas Summary

Detailed figures of the proposed aquatic resources mitigation activities and areas are included in Appendix G as Figures G-1 through G-8. The projected functional capacity of the downstream aquatic resources mitigation areas, as assessed using SWAMPIM, is detailed in Table G-1, which is also included in Appendix G. This table provides the net functional capacity uplift for the downstream mitigation areas and includes analysis of the projected uplift for each stream identified for aquatic resources mitigation. Table G-2, which includes 54 sub-tables for each stream segment within the aquatic resources mitigation boundary, is also included in Appendix G. Table G-2 corresponds with Table G-1 and provides a granular analysis of pre- and post-project SWAMPIM metric scoring and information regarding proposed mitigation activities and work performed, rationale for lift, and success criteria for each stream channel within the proposed aquatic resources mitigation boundary.

Table 7 below summarizes Table G-1. It includes a summary of pre-project baseline functional capacity and post-project projected functional capacity for aquatic resources based on the proposed project mitigation activities. The resulting net uplift of functional capacity projected within the downstream aquatic resources mitigation boundary is 437 FCUs.

TABLE 7: SUMMARY OF PRE-PROJECT (BASELINE) AND POST-PROJECT FUNCTIONAL CAPACITY OF AQUATIC RESOURCES WITHIN PROPOSED AQUATIC RESOURCES MITIGATION BOUNDARY

Category	Mitigation Activity	Length (feet)	Pre-Project Baseline FCU	Post-Project FCU
Stream	Enhancement	37,656	39	106
Stream	Restoration/Creation	77,708	0	389
Stream	Filled	30,589	19	0
	TOTAL	--	58	495
Net Functional Capacity Uplift for Mitigation Activities (495 – 58)				**437**

Note: Refer to Appendix G for detailed tables and figures.

As shown in Table 3, the functional capacity for aquatic resources in the area of the conservation pool, dam, and spillway is 430 FCUs. The proposed mitigation activities to be conducted in the downstream aquatic resources mitigation boundary are projected to generate a net functional capacity for aquatic resources of 437 FCUs. Since the projected functional capacity of the mitigation activities is greater than those impacted with the proposed LRH constructed, the Project as proposed will meet the requirements of no net loss of aquatic resources.

Table 8 provides a summary demonstrating that the Project will achieve no net loss of aquatic resources.

TABLE 8: COMPARISON OF AQUATIC RESOURCES FUNCTIONAL CAPACITY IMPACTS AS A RESULT OF PROPOSED PROJECT VERSUS FUNCTIONAL CAPACITY FROM PROPOSED MITIGATION ACTIVITIES

DESCRIPTION	FCU
Pre-project Aquatic Resources FCUs (Aquatic Resources Impacted with the Proposed Lake Ralph Hall Constructed)	430[1]
Post-project Aquatic Resources FCUs with the Proposed Mitigation Activities Implemented	437[2]
Net Functional Capacity Uplift for Project	**7**

Notes for Table 8:
1. Detailed accounting of impacted aquatic resources resulting from the construction of Lake Ralph Hall is summarized in Table 3.
2. Refer to Table 7 above.

On-Channel Impoundments

Existing open water resources characterized as on-channel impoundments are located within the proposed project boundary. Approximately 56.19 acres of on-channel impoundments would be inundated by the proposed reservoir. Approximately eight (8) acres of lacustrine fringe wetland area associated with the on-channel impoundments located within the proposed conservation pool footprint would also be inundated. An additional two (2) acres of lacustrine fringe wetland areas associated with the approximately 13.69 acres of on-channel ponds located outside the proposed conservation pool footprint but within the project boundary would not be impacted. The existing on-channel impoundments functions were evaluated using SWAMPIM to determine the resource capacity. The impacts to on-channel impoundments and approximately eight (8) acres of associated lacustrine fringe wetlands within the proposed conservation pool footprint would be off-set by the substantially increased resource capacity score, as outlined in Table 9, resulting from the proposed LRH. The increase in shallow lake edge along the shoreline of the proposed LRH reservoir is anticipated to develop substantially more than eight (8) acres of lacustrine fringe wetland area as well as an increase in open water area.

TABLE 9: CURRENT CONDITION AND WITH-PROJECT COMPARISON OF IMPOUNDMENT RESOURCE CAPACITY SCORES

IMPOUNDMENTS	Pre-Project[1]		Post-Project	
	Area (Acres)	Resource Capacity[2]	Area (Acres)	Resource Capacity
Within Conservation Pool, dam, spillway	56.19	28.64	7,568[3]	5,784[4]
Outside Conservation Pool	13.69	5.46	13.69	5.46
TOTAL	**69.88**	**34.10**	**7,582**	**5,789**
Pre and Post-Project Impoundment Resource Capacity Difference				**5,755**

Notes for Table 9:

1. Acreage from June 21, 2017 SJD report approved by USACE in letter dated July 27, 2017 (Ref: Mitigation Plan Appendix B). Refer to Table 4 for more detail.

*2. Resource Capacity calculated based on average Resource Condition Index (RCI) * (Total Acreage of All Impoundments in Category)*Multiplication Factor. RCIs based on assessment of representative impoundments for each size category for physical, watershed/management, biological, and water quality variables; total score for each impoundment divided by 100 (the maximum total score possible), then RCIs for all representative impoundments in each category are totaled then total divided by number of impoundments to determine average RCI score. Impoundment categories and multiplication factors are: small pond < 1 acre (1.5); pond >1 ≤5 acres (1.3), lake >5 ≤500 acres, (1.1; reservoir >500 acres (1.04). (Ref: Mitigation Plan Appendix C).*

3. Projected acreage of proposed reservoir footprint.

*4. Resource capacity based on Projected RCI*acreage of proposed reservoir*multiplication factor for reservoir.*

B. Terrestrial Resources Mitigation

In addition to compensatory mitigation for impacts to aquatic resources required by Section 404 of the Clean Water Act, Texas State Law (Texas Water Code § 11.152; 30 TAC § 297.53) requires consideration for impacts to fish and wildlife habitats including terrestrial resources for any new or amended water right to store, take, or divert state water in excess of 5,000 acre-feet per year. To facilitate evaluation of potential impacts to these habitats, the TPWD's WHAP was selected to assess the terrestrial habitat within the proposed LRH project area. A preliminary habitat assessment, documented in a report[27] dated December 6, 2005, included classification of land cover within the proposed conservation pool area and evaluation of habitat quality using the WHAP. In the documentation of its Decision Order, the Texas Commission on Environmental Quality (TCEQ) listed Findings of Fact including many which detailed the impacts of the historical NSR Channelization Project, the existing conditions of the NSR watershed, and its evaluation of the habitats within the proposed project area. The final Water Use Permit No. 5821 (dated December 11, 2013) includes several Special Conditions. Special Conditions related to aquatic resources are met with the proposed mitigation activities described in the previous sections of this mitigation plan. Special Condition M related to terrestrial resources mitigation is included below:

Special Condition Excerpted from Water Use Permit No. 5821:

> *M. Permittee shall establish and maintain a riparian buffer zone of permanent vegetation around the perimeter of the reservoir averaging at least 50 feet in width with the exception of reasonable access areas and the area of the dam and spillway. Permittee shall also establish and maintain riparian buffer zones 25 to 50 feet wide at or below elevation 560 feet msl along Bear Creek, Brushy Creek, Pickle Creek, Davis Creek, Leggets Branch, Bralley Pool Creek, Merrill Creek, the North Sulphur River, and along unnamed tributaries within the area of the reservoir project. The buffer zones shall be planted with native vegetation as necessary to ensure complete coverage at maturity.*

The UTRWD is required to comply with all Special Conditions of Water Use Permit No. 5821. A copy of the Water Use Permit is included in Appendix H.

[27] Alan Plummer Associates, Inc. *Lake Ralph Hall Preliminary Habitat Assessment*. December 6, 2005 updated August 2011.

IV. LIENS AND ENCUMBRANCES

The aquatic resources mitigation provided in conjunction with the project components would be located on project lands purchased by UTRWD in union with the development of LRH. Currently, the only known encumbrances that may affect the mitigation areas are existing road rights of way.

Fannin County has road rights of way located within the proposed aquatic resources mitigation boundary. These road rights of way would be identified and accounted for during development of the mitigation work.

V. MITIGATION PLAN SCHEDULE

Design of the proposed project is anticipated to begin shortly after applicable permits are issued. The Water Use Permit from the State of Texas for LRH, dated December 11, 2013, has been received from the TCEQ. Upon receipt of the Clean Water Act, Section 404 authorization from the USACE, detailed design for the reservoir project will advance. Construction for the proposed project is anticipated to commence once detailed design is complete. Construction activities would be conducted consistent with the time limitations included in TCEQ Water Use Permit No. 5821. Implementation of the mitigation plan would be concurrent with the construction of the embankment and impoundment of water within the reservoir.

- Purchase of Project Lands: Lands are currently being purchased from willing landowners. All project lands would be purchased prior to the completion of construction, or condemned, if necessary. Critical lands would be purchased before construction begins.

VI. MAINTENANCE PLAN

Aquatic resources mitigation areas including stream channels and forested riparian areas would be maintained by UTRWD as natural areas with minimal disturbance. UTRWD would be responsible for maintenance activities within the project and proposed aquatic resources mitigation boundary. The aquatic resources mitigation areas would be maintained as natural areas with periodic mowing during mitigation site development. Planted aquatic resources mitigation areas may be mown no more than four times per year during the first two years after planting activities are conducted, if needed, to control weedy species and to facilitate establishment of desirable native herbaceous cover. Once desirable native herbaceous species are established, the aquatic resources mitigation areas may be mown once during the dormant season (December-February) and once during the growing season during late summer (July-August), and only if needed to control growth of noxious or aggressive vegetation (e.g., ragweed (*Ambrosia spp*.), Johnsongrass (*Sorghum halepense*), or others) which may inhibit establishment of more desirable species and overall diversity of vegetative cover. All mowing activities would be conducted in a manner to minimize disturbance to stream channel riparian areas and to minimize impacts to desirable native grasses and forbs (i.e., mowing height of at least six (6) inches).

The stream channels within the mitigation area would be monitored at least quarterly to determine if in-stream structural controls (e.g., cross-vanes, j-hook vanes, w-weirs, rock/log vanes) are functioning as intended or if maintenance repairs are needed. Any repairs required for in-stream structures would be conducted in a manner to minimize disturbance to the riparian vegetation. In the event that vegetation is disturbed during the maintenance activities, the disturbed area would be stabilized with appropriate native vegetation as soon as possible and additional erosion control measures would be employed until vegetative cover is re-established.

In areas where perimeter fencing is employed, it would be monitored at least annually and repairs undertaken immediately for any identified breaches which would provide uncontrolled access from outside the aquatic resources mitigation boundary. All fencing will be maintained in good working order.

Control measures for undesirable invasive woody species (e.g. Eastern red cedar (*Juniperus virginiana*), Chinese tallow (*Triadica sebifera*), or other) would include prescribed burns, mechanical, and/or chemical means, as described further in Section X.

VII. SITE PROTECTION INSTRUMENT

The proposed LRH project area including the conservation pool area and the mitigation areas within the project boundary would be controlled by the UTRWD. Upstream of the Leon Hurse Dam, the UTRWD would own in fee simple the area of the proposed LRH conservation pool and control either through ownership in fee simple or through appropriate easements the area above the proposed LRH conservation pool to the project boundary. The area within the proposed aquatic resources mitigation boundary below the Leon Hurse Dam would be owned in fee simple. Long-term protection for the mitigation areas would be provided through the management plan for the project, as described in Section X of this Mitigation Plan. In addition, long-term protection for the aquatic resources mitigation areas within the UTRWD-owned aquatic resources mitigation boundary will be provided through a USACE-approved deed restriction. The UTRWD would be responsible for long-term maintenance and protection of the aquatic mitigation areas within the proposed aquatic resources mitigation boundary and terrestrial mitigation areas within the project boundary. These mitigation areas include the proposed restoration of the former NSR downstream of the proposed Leon Hurse Dam which is part of the South Mitigation Area, the restoration of the NSR Main Channel between the Leon Hurse Dam to the confluence of Baker Creek, the North Mitigation Area downstream of the proposed Leon Hurse Dam to Baker Creek, other riparian corridor areas, native prairie restoration areas, and the water quality buffer zone in accordance with the management plan.

The UTRWD shall record the USACE-approved deed restriction with the Fannin County Clerk and provide a copy of the recorded deed restriction to the USACE Fort Worth District. In addition, the deed restriction would contain a provision requiring 60-day advance notification to the USACE District Engineer before any action is taken that could void or modify the instrument, management plan, or long-term protection mechanism, including transfer of title to, or establishment of any other legal claims over, the aquatic resources mitigation areas. The UTRWD would also provide the USACE with a map showing the extent of their ownership in the proposed aquatic resources mitigation boundary upon or prior to completion of the mitigation planting areas.

Consistent with USACE practices for site protection of aquatic resources mitigation areas, UTRWD is committed to following requirements to protect the LRH aquatic resources mitigation areas. The aquatic resources mitigation areas would not be disturbed, except by those activities that would not adversely affect the intended extent, condition, and function of the mitigation area or by those activities specifically provided for in the approved mitigation plan or in the special conditions for this permit. Unless otherwise specified, livestock grazing, routine mowing, and similar activities would not be allowed in the aquatic resources mitigation areas. Any other change, modification, or disturbance of the dedicated property shall require prior written approval by the District Engineer, USACE, Fort Worth District, or his/her duly appointed representative.

VIII. PERFORMANCE STANDARDS

The progress of the aquatic resources mitigation areas towards achieving the goals and objectives stated in the mitigation plan would be monitored by assessing functions of the aquatic resources within the aquatic resources mitigation boundary using SWAMPIM. Components of the mitigation activities assessed would include the channel stabilization structures, hydrology, vegetation, soils, and habitat. Monitoring may include but is not limited to standard sampling methods, collecting hydrologic data, SWAMPIM assessments, and developing a photographic record of the progress of the aquatic resources mitigation areas. Monitoring techniques may include but are not limited to: mapping vegetative communities, conducting plant inventories, noting problem species, establishing and using transects or permanent sampling stations, measuring species and the stratum, unmanned aerial vehicle, and determining the total number of species importance value.

Aquatic Resources

Based on the information gleaned from various SWAMPIM assessments of the project area, the UTRWD would achieve the necessary uplift through the following mitigation activities:

- Restoration/creation of the former NSR channel downstream of the LRH dam to a confluence with the NSR Main Channel immediately west of FM 904;
- Restoration, creation, and enhancement of tributaries to the restored former NSR channel;
- Creation, restoration, and enhancement of tributaries to the NSR Main Channel and Baker Creek located downstream of the LRH dam and north of the NSR Main Channel; and
- Restoration and creation of a bankfull channel and functioning floodplain within the NSR Main Channel downstream of the LRH dam to immediately upstream of the confluence of Baker Creek.

The Applicant proposes that the performance standard for the aquatic resources mitigation is the demonstration that it has implemented the proposed mitigation measures; those measures are in place and stable after a period of seven (7) years after completion of the project including any

remedial plantings; and the applicant has allocated the resources to maintain those measures for the life of the project. Monitoring of the establishment of forested riparian corridors for number and diversity of woody stems per acre would be based on systematic sampling of established monitoring plots. The GPS coordinates of the center point of each plot would be recorded and utilized to relocate the plots for successive monitoring efforts. At each center point, a standard forestry 1/100th acre circular quadrat (approximate 12-foot radius) would be established. The 1/100th acre quadrat would be used to count woody stems, and a nested 12-foot belt (1-foot wide) transect within the quadrat would be assessed for coverage of herbaceous plants. The nested belt transect would be established at one of the four (4) cardinal positions and rotated clockwise between yearly monitoring. One (1) plot per every ten (10) acres is proposed for monitoring within the designated riparian corridor restoration areas to include bank stabilization vegetation. Approximately 1,925 acres are included in the aquatic resources mitigation boundary downstream of the Leon Hurse Dam, so this would equate to 193 plots. The number and locations of these monitoring plots would be submitted to the USACE for approval prior to vegetation assessment.

For all aquatic resources mitigation areas, if the three most dominant woody species three years after completion of reservoir construction, including mitigation activities, are comprised of non-native, noxious, or invasive species, implementation of management options (e.g., prescribed burns, mechanical means, or chemical treatment) would be undertaken to remove the undesirable species. A listing of invasive, noxious, prohibited, and exotic vegetation species for Texas is provided in Table 10. Other species may be added to the Table 10 listing. Remedial plantings of woody species as outlined in Section III.B.5 would be initiated, as needed, to achieve the targeted density of desirable woody stems per acre. All wooded riparian corridors within the aquatic resources mitigation boundary must achieve a minimum of 200 woody stems per acre with a minimum of seven WHAP species diversity categories and a minimum of 15 individual woody species seven years from the last remedial planting date. [28]

[28] Texas Parks and Wildlife Department. Wildlife Habitat Appraisal Procedure: PWD RP – W7000 – 0145. December 2006.

TABLE 10: STATE AND FEDERAL LIST OF INVASIVE, NOXIOUS, PROHIBITED, AND EXOTIC VEGETATIVE SPECIES[29]

Scientific Name	Common Name
Alhagi maurorum	Camelthorn
Alternanthera philoxeroides	Alligatorweed
Arundo donax	Giant reed
Asphodelus fistulosus	Onionweed
Calystegia sepium	Hedge false bindweed
Cardiospermum halicacabum	Balloonvine
Commelina benghalensis	Tropical Spiderwort
Convolvulus arvensis	Field bindweed
Cuscuta japonica	Japanese dodder
Cyperus entrerianus	Deep-rooted sedge
Eichhornia azurea	Anchored water hyacinth
Eichhornia crassipes	Common water hyacinth
Hydrilla verticillata	Hydrilla
Ipomoea aquatica	Swamp morning-glory
Lagarosiphon major	Oxygen-weed
Landoltia punctata	Dotted duckmeat
Limnophila sessiliflora	Limnophila
Lythrum salicaria	Purple loosestrife
Melaleuca quinquenervia	Melaleuca
Melia azedarach	Chinaberry tree
Myriophyllum aquaticum	Parrotfeather milfoil
Myriophyllum spicatum	Eurasian watermilfoil
Nassella trichotoma	Serrated tussock grass
Orobanche ramosa	Hemp broomrape
Panicum repens	Couch panicum; torpedograss
Pistia stratiotes	Water lettuce
Pueraria montana var. lobata	Kudzu
Rottboellia cochinchinensis	Itchgrass
Salvinia minima	Common salvinia
Salvinia molesta	Giant salvina
Schinus terebinthifolius	Brazilian peppertree
Solanum tampicense	Scrambling nightshade, aquatic soda apple
Solanum viarum	Tropical soda apple
Spirodela oligorrhiza	Giant duckweed
Tamarix africana	African tamarisk
Tamarix aphylla	Athel tamarisk
Tamarix chinensis	Fivestamen tamarisk
Tamarix gallica	French tamarisk
Tamarix parviflora	Smallflower tamarisk
Tamarix ramosissima	Salt cedar
Triadica sebifera	Chinese tallow tree

[29] http://texasinvasives.org/plant_database/index.php accessed February 13, 2017

If initial monitoring indicates that the wooded riparian corridor areas within the aquatic resources mitigation boundary have not achieved a minimum density of 200 woody stems (trees and shrubs) per acre, the UTRWD would perform remedial plantings until at least a density of 200 stems per acre is achieved for seven years following the last remedial planting. Native volunteer species may be included in the stem count, but a single species cannot exceed 25 percent of the vegetation diversity.

All aquatic resources mitigation areas selected for herbaceous cover restoration should exhibit 80 percent ground cover seven years after closure of the Leon Hurse Dam. Following seven years after closure of the Leon Hurse Dam, should the assessment of the herbaceous cover restoration areas indicate that the three most dominant herbaceous species are comprised of non-native, noxious, or invasive species, the UTRWD would eradicate these species by mechanical and/or chemical means. Once the non-native, noxious, or invasive species are controlled, the UTRWD would reseed these areas with native seed mixtures specified in Table 6. The vegetation would then be monitored to ensure 80 percent ground cover is achieved for seven years following the latest remedial planting.

The areas identified to provide compensatory mitigation for losses to existing aquatic functions would be maintained by the UTRWD in perpetuity, and annual monitoring reports submitted to the USACE until such time that the USACE is satisfied the aquatic resources mitigation areas meet the criteria outlined in this mitigation plan. These aquatic resources mitigation areas must function as their intended type and at the ecological level described in the mitigation plan. Buffer and riparian zones and other areas integral to the enhancement of the aquatic ecosystem including areas identified for herbaceous and tree and shrub planting must function as their intended type of ecosystem component and at the level of ecological performance described in this mitigation plan. The buffer and riparian zones identified for remedial planting must satisfy the success criteria identified in this mitigation plan.

For the proposed South Mitigation Area within the aquatic resources mitigation boundary downstream of the Leon Hurse Dam, runoff from the contributing watershed would provide periodic inflows to the channel of the restored former NSR. Hydraulic and hydrologic modeling

for the watershed of the restored former NSR indicate that these inflows will be sufficient to sustain an intermittent stream with perennial pools as well as provide overbanking flows into the channel's floodplain. The technical memorandum dated August 11, 2017 prepared by Robert J. Brandes Consulting documenting the modeling results is provided in Appendix F. Releases of stored water from LRH would only be provided as needed to maintain water levels and water quality in pools as required under Special Condition #H of the Water Use Permit No. 5821 issued by TCEQ.

IX. MONITORING REQUIREMENTS

The UTRWD would report to the USACE monitoring results, mitigation success, and general compliance with the terms and conditions of the permit. The USACE would be notified of the schedule of activities for each phase of the mitigation plan at least 30 days prior to the start of soil-disturbing activities.

The UTRWD would submit annual written compliance reports, due October 31st each year beginning with the issuance of the Section 404 permit. These reports would be submitted to the USACE even if no work is conducted during the reporting period. These reports would continue until the USACE verifies that the UTRWD successfully completed all aquatic resources mitigation plan components, the aquatic resources mitigation areas met performance standards, and all authorized construction activities were completed. Each report shall contain, at a minimum, the following elements:

- A description of construction or mitigation plan schedule changes, if any;
- A summary of activities that occurred during the reporting period;
- Documentation regarding UTRWD's compliance with permit conditions;
- Documentation of the progress and/or completion of authorized work including mitigation plan activities in meeting performance standards and planting success;
- Documentation that disturbed areas are vegetated to control erosion;
- Documentation that adjacent aquatic areas are adequately protected from construction activities;
- Photographs, maps, and drawings to support the written components of the mitigation plan; and
- Copies of the monitoring reports documenting the functionality of the riparian mitigation area and restored NSR channel downstream of the LRH dam, as required to be submitted to the TCEQ by Special Condition of Water Use Permit No. 5821, or as subsequently amended, (included in Appendix H) would also be included with the annual compliance monitoring reports submitted to the USACE.

A qualified biologist, ecologist, or similar would be retained to oversee mitigation plan implementation, including planting, monitoring, and compliance reporting provisions.

X. LONG TERM OPERATION AND MANAGEMENT PLAN

The UTRWD would own in fee simple the area of the LRH conservation pool and control either through ownership in fee simple or through appropriate easements the area above the LRH conservation pool to the project boundary. Accordingly, the LRH project boundary would be maintained as a buffer area to promote water quality for the reservoir in accordance with Special Condition M of the Water Use Permit 5821.

The area within the proposed aquatic resources mitigation boundary downstream of the Leon Hurse Dam would be owned in fee simple by the UTRWD and would be operated and managed as an environmentally sensitive areas for wildlife habitat, public green space for outdoor recreation activities (public viewing, nature observation, photography), and outreach and educational opportunities including (but not limited to) studies of wildlife, native plants, water chemistry, and ecology.

If needed, management of the environmentally sensitive areas would include occasional mowing, as described previously, other mechanical removal methods, herbicides, prescribed burns, or other applicable methods to control undesirable vegetation, and to control weedy herbaceous species during the establishment of the native vegetation. Mowing activities would be conducted in a manner to minimize disturbance to the mitigation area topography and to minimize impacts to desirable native grasses and forbs (i.e., mowing height at least 6 inches). Most invasive and/or nuisance species, either native or non-native, can be controlled in total or to some degree with prescribed burns. However, if low-intensity prescribed fire does not kill the target species or if the target species should return between burn intervals, chemical herbicide applications can be used. Broad spectrum systemic herbicides such as glyphosate, Triclopyr, and/or Imazapur are preferred for chemical control. Formulations of these herbicides approved for use in and around aquatic areas should be used for applications within the project mitigation areas. Herbicidal applications would be applied only as necessary, at label specified rates, and only to the targeted species. Appropriate techniques for herbicide applications for control of undesirable vegetation to avoid impacts to desirable vegetation include cut-stump method, basal bark methods, wicking applications, or low-pressure spray applications using hand-held sprayers. Areas should not be burned for at least 30 days after an herbicide treatment and preferably six (6) months after any

chemical applications. Any maintenance efforts considered necessary within the areas adjacent to the USFS's Ladonia Unit of the Caddo National Grasslands would be coordinated with TPWD and/or USFS. An annual maintenance fund would be established by the UTRWD to facilitate the proposed management activities. This funding would be provided in the general operations budget for LRH.

In addition to the establishment of vegetation within the aquatic resources mitigation areas, additional measures, including bioengineered structural controls, would be employed to improve stream bank and channel stability. The UTRWD would be responsible for monitoring and managing the installed structures and implementing repairs to the structures, as needed, to maintain intended grade control functions. Additional funding would be added to the annual maintenance fund to provide sufficient resources to maintain channel stability structures.

All of this information would be detailed in a Reservoir Operations and Management Manual. This manual would be completed prior to close of construction for LRH. At a minimum, the Reservoir Operations and Management Manual would be reviewed every three years. As warranted, revisions would be made to the manual keeping in concert with the principal goal of maintaining favorable water quality within LRH and stability within the aquatic resources mitigation areas downstream of the LRH dam. An individual responsible for the long-term management and operation of the aquatic resources mitigation areas would be designated by the UTRWD.

XI. ADAPTIVE MANAGEMENT PLAN

The goal of the adaptive management plan would be to provide a process that would provide resource protection, management, and a monitoring framework. Should foreseeable or unforeseen changes in site conditions jeopardize aquatic resources mitigation success both near-term and long-term, the plan would be initiated to provide the necessary corrective measures to meet the mitigation goals, objectives, and performance standards. The plan, at a minimum, would include the following information:

- Identify mitigation concerns;
- Identify solutions;
- Implement the plan; and
- Measure and report progress.

In the event remedial measures are necessary, the UTRWD would be the responsible party for the implementation of the adaptive management plan. Any remedial measures that involve revision to the approved mitigation plan would be coordinated with the USACE for approval prior to implementation. A copy of the adaptive management plan would be provided to the USACE during the compliance monitoring period associated with the project.

An example of a foreseeable corrective measure includes the planting of vegetation due to a number of circumstances. Generally, adverse circumstances could include vandalism (intentional or unintentional), mortality, herbivory, weather conditions, and competition. The native tree, shrub, grass, legume, and forb species to be planted within the identified aquatic resources mitigation areas were selected based on suitability to the ecoregion and landscape position. However, the aforementioned circumstances may impede survival during the vegetative cover establishment period. During the monitoring period, impacts to mitigation vegetation would be assessed. If any of the abovementioned circumstances are affecting survival and establishment of the native species, corrective measures would be employed to facilitate establishment or replanting and reseeding of areas with the specified mixtures.

XII. FINANCIAL ASSURANCES

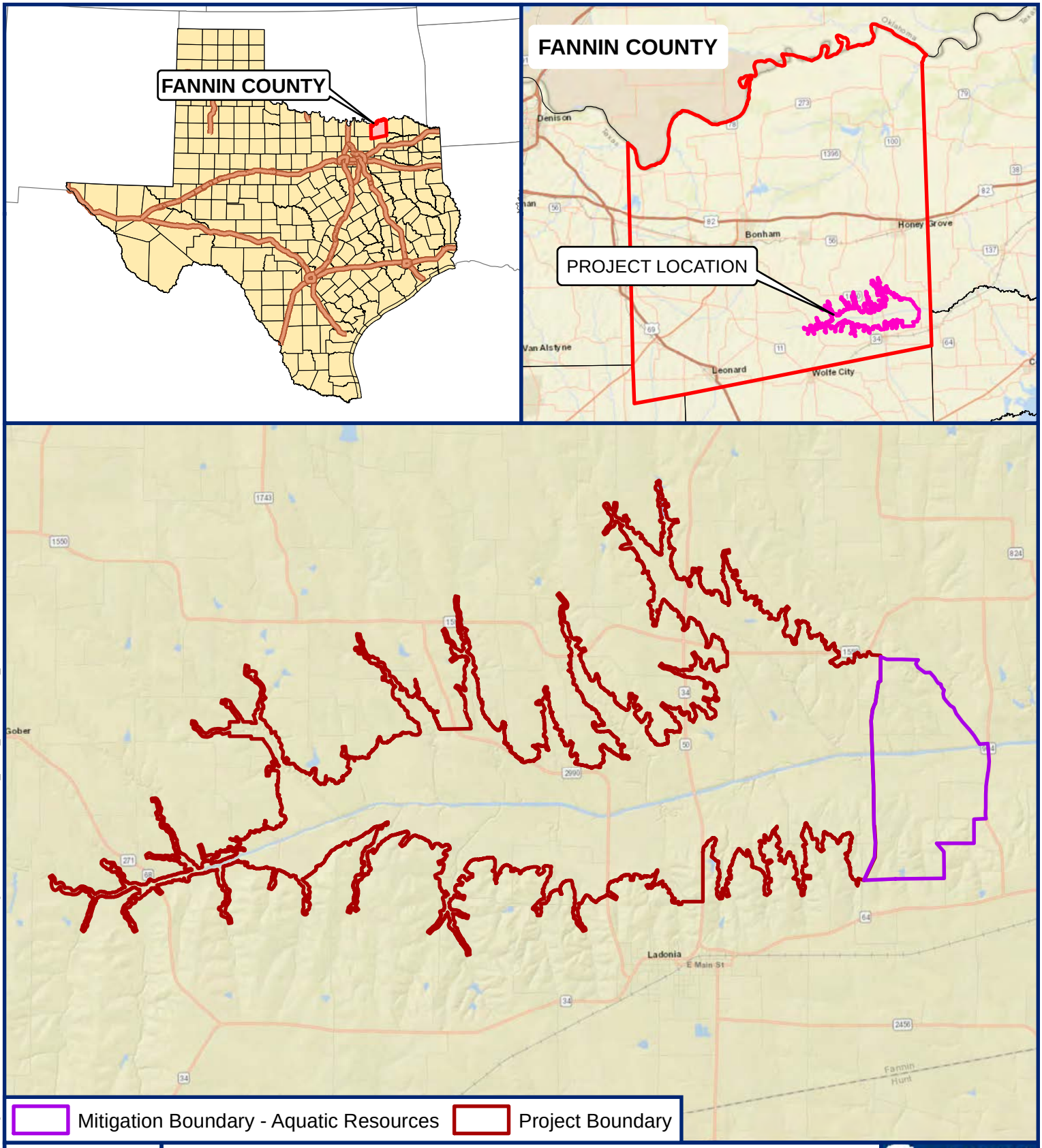
The UTRWD, in conjunction with the construction of the proposed LRH, would control through ownership in fee simple or appropriate easements to the project boundary upstream of the Leon Hurse Dam as well as own the aquatic resources mitigation boundary downstream of the dam in full fee-simple ownership. This would provide protection to the full project boundary and downstream aquatic resources mitigation boundary by being under the ownership and supervision of the UTRWD. These transactions would take place prior to and/or during construction of the reservoir.

With regard to long-term maintenance and operations and adaptive management of the aquatic resources mitigation boundary, the UTRWD would provide an annual maintenance budget for the project. This budget would be dedicated to providing long term monitoring, maintenance, and operation of the reservoir's aquatic resources mitigation areas. This budget would be expressly dedicated to repairing instream aquatic habitat stabilization measures, bank stability structures, removal of undesirable nuisance species (faunal and floral), and any warranted supplemental planting.

Lastly, the UTRWD would designate an individual, whose job description would include, amongst other tasks, monitoring of the aquatic and terrestrial mitigation measures employed for the project. Should corrective measures be necessary, this individual would have access to the annual maintenance budget to enact the remedial measures outlined in Sections X and XI for Long-Term Operation and Management and Adaptive Management, respectively. This budget may also be used to hire independent consultants and contractors to complete any necessary work in the mitigation areas.

APPENDIX A

FIGURES



N
W E
S

FIGURE A-1
GENERAL LOCATION
PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. UNIVERSITY DRIVE
SUITE 300
FORT WORTH, TEXAS 76107
PHONE: (817) 806-1700
FAX: (817) 870-2536

DATE: 2/5/2018

FIGURE 1 of 10

2 1 0 Miles

SOURCE: ESRI BASE DATA/TNRIS

USACE PROJECT NUMBER:
SWF-2003-00336

Document Path: F:\projects\0346\004-032016 Mitigation - New November Forward\Revised Mitigation Plan\MITIGATION_PLAN_FIGURES\A1_GENLOC.mxd

500-FEET WIDTH ASSESSMENT AREA

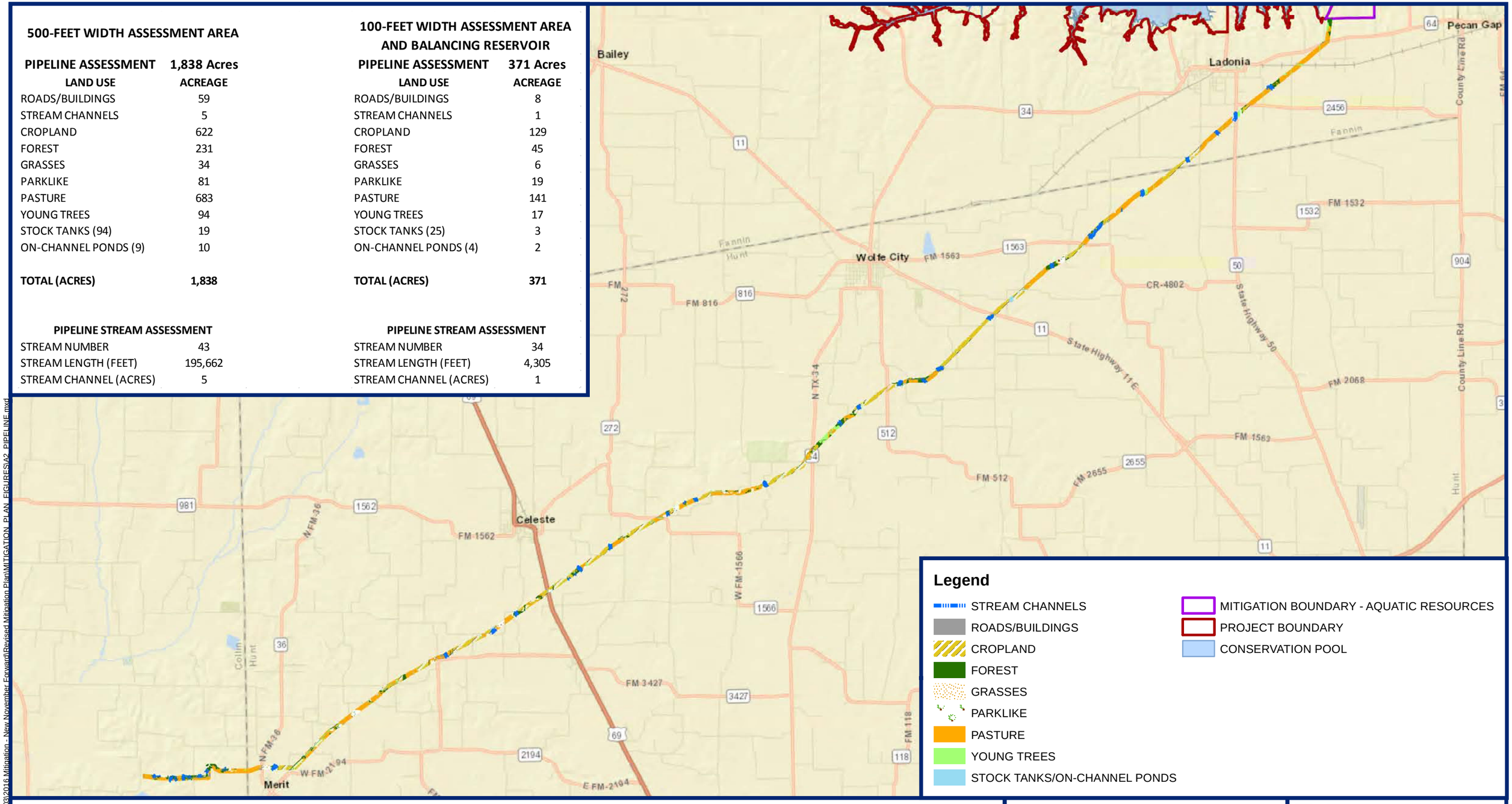
PIPELINE ASSESSMENT	1,838 Acres
LAND USE	**ACREAGE**
ROADS/BUILDINGS	59
STREAM CHANNELS	5
CROPLAND	622
FOREST	231
GRASSES	34
PARKLIKE	81
PASTURE	683
YOUNG TREES	94
STOCK TANKS (94)	19
ON-CHANNEL PONDS (9)	10
TOTAL (ACRES)	**1,838**

PIPELINE STREAM ASSESSMENT	
STREAM NUMBER	43
STREAM LENGTH (FEET)	195,662
STREAM CHANNEL (ACRES)	5

100-FEET WIDTH ASSESSMENT AREA AND BALANCING RESERVOIR

PIPELINE ASSESSMENT	371 Acres
LAND USE	**ACREAGE**
ROADS/BUILDINGS	8
STREAM CHANNELS	1
CROPLAND	129
FOREST	45
GRASSES	6
PARKLIKE	19
PASTURE	141
YOUNG TREES	17
STOCK TANKS (25)	3
ON-CHANNEL PONDS (4)	2
TOTAL (ACRES)	**371**

PIPELINE STREAM ASSESSMENT	
STREAM NUMBER	34
STREAM LENGTH (FEET)	4,305
STREAM CHANNEL (ACRES)	1



Legend

- STREAM CHANNELS
- ROADS/BUILDINGS
- CROPLAND
- FOREST
- GRASSES
- PARKLIKE
- PASTURE
- YOUNG TREES
- STOCK TANKS/ON-CHANNEL PONDS
- MITIGATION BOUNDARY - AQUATIC RESOURCES
- PROJECT BOUNDARY
- CONSERVATION POOL

FIGURE A-2. LAND USE ASSESSMENT FOR THE PROPOSED RAW WATER CONVEYANCE PIPELINE

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

N

0 1.5 3 Miles

FIGURE 2 of 10

SOURCE: ESRI BASE DATA/TNRIS

DATE: 2/5/2018

USACE PROJECT NUMBER: SWF-2003-00336

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com

Document Path: F:\projects\0346\004-03\2016 Mitigation - New November Forward\Revised Mitigation Plan\MITIGATION_PLAN_FIGURESA2_PIPE

Document Path: F:\projects\0346\004-03\2016 Mitigation - New November Forward\Revised Mitigation Plan\MITIGATION_PLAN_FIGURES\A3_DELINEATIONLINES.mxd

FIGURE A-3. DELINEATED AQUATIC RESOURCES

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

Legend

- SJD ASSESSMENT AREA

STREAM LOCATION

- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE

- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

FIGURE 3 of 10

SOURCE: ESRI BASE DATA/TNRIS

DATE: 2/5/2018

USACE PROJECT NUMBER: SWF-2003-00336

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com

SH 34

N

FM 904

NORTH SULPHUR RIVER

FM 68

LADONIA

0 0.5 1 Miles

SH 34

FM 64

FIGURE A-4. PROPOSED MITIGATION BOUNDARY

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

Mitigation Boundary - Aquatic Resources

Project Boundary

FIGURE 4 of 10

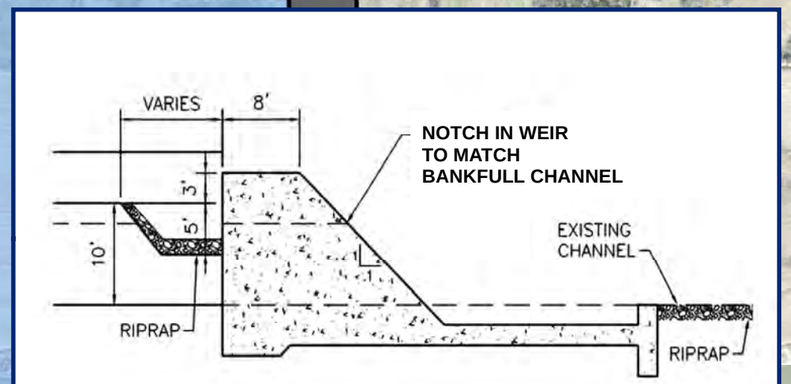
SOURCE: ESRI BASE DATA/TNRIS

DATE: 2/5/2018

USACE PROJECT NUMBER: SWF-2003-00336

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com

Document Path: F:\projects\0346\004-03\2016 Mitigation - New November Forward\Revised Mitigation Plan\MITIGATION_PLAN_FIGURES\A4_MITBOUNDARY.mxd



TRANSITION DROP STRUCTURE
(NOT TO SCALE)

Transition Drop Structure
(See Inset)

FM 904

N

NORTH SULPHUR RIVER MAIN CHANNEL

See Figure A-6 for
Typical Plan View and
Cross-Sections

0 0.075 0.15
Miles

- Restored Intermittent Stream with Perennial Pools - Former NSR
- Dam and Spillway
- Mitigation Boundary - Aquatic Resources
- Conservation Pool

FIGURE A-5. FORMER NORTH SULPHUR RIVER RESTORATION - PLAN VIEW

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

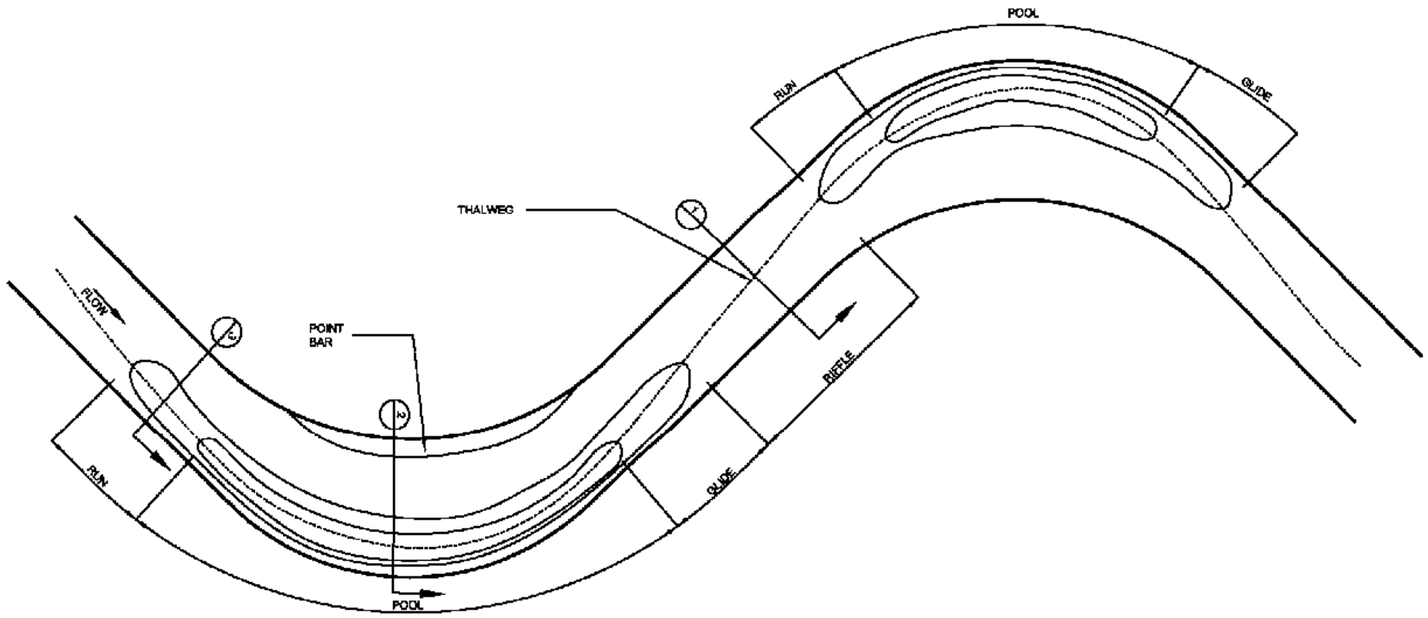
FIGURE 5 of 10

SOURCE: ESRI BASE DATA/TNRIS

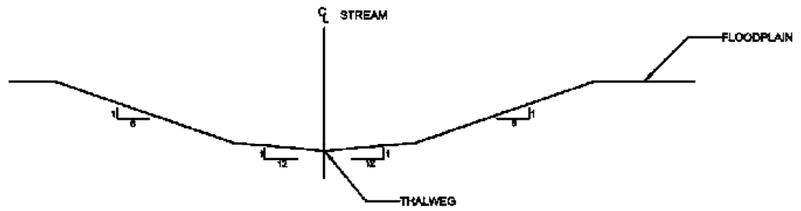
DATE: 2/5/2018

USACE PROJECT NUMBER:
SWF-2003-00336

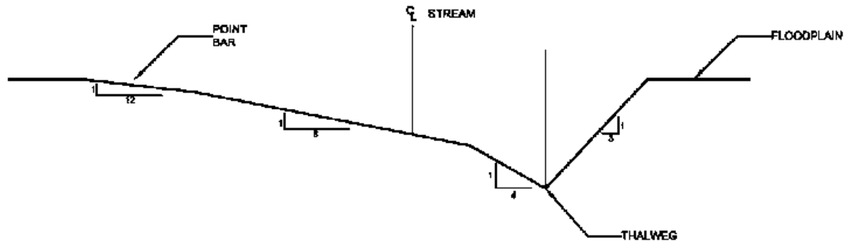
ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL
ENGINEERS AND SCIENTISTS
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com



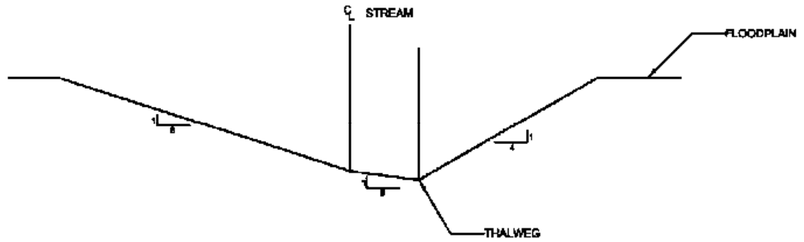
PLAN VIEW - ILLUSTRATIVE RIFFLE, RUN, POOL, GLIDE SEQUENCE - BANKFULL CHANNEL
RESTORED FORMER NORTH SULPHUR RIVER
NOT TO SCALE



1 — TYPICAL RIFFLE SECTION - RESTORED FORMER NORTH SULPHUR RIVER
NOT TO SCALE



2 — TYPICAL POOL SECTION - RESTORED FORMER NORTH SULPHUR RIVER
NOT TO SCALE



3 — TYPICAL RUN/GLIDE SECTION - RESTORED FORMER NORTH SULPHUR RIVER
NOT TO SCALE

FIGURE A-6. TYPICAL PLAN VIEW AND CROSS-SECTIONS - RESTORED NORTH SULPHUR RIVER

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

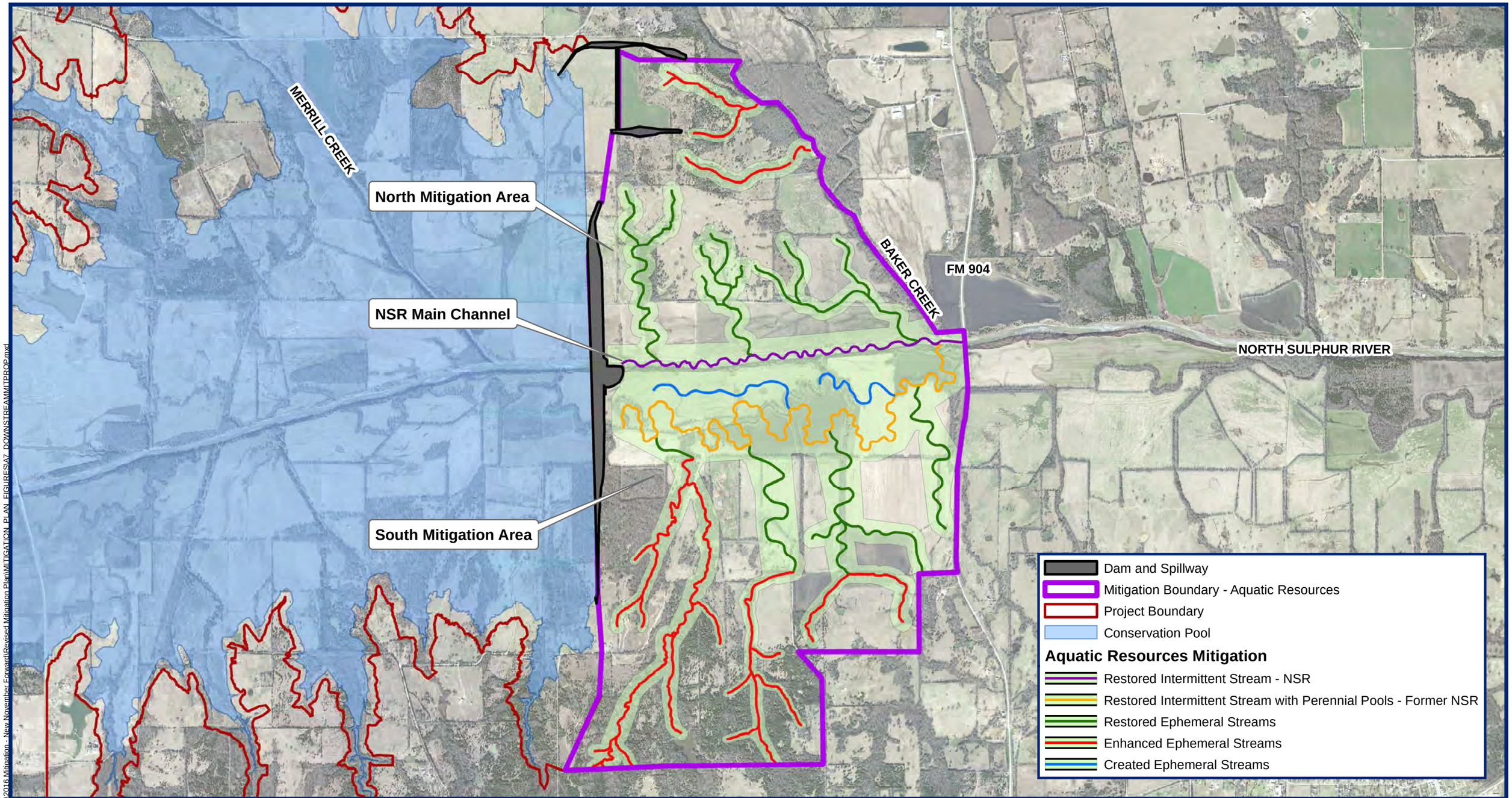
FIGURE 6 of 10

SOURCE: ESRI BASE DATA/TNRIS

DATE: 2/5/2018

USACE PROJECT NUMBER:
SWF-2003-00336

ALAN PLUMMER ASSOCIATES, INC.
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com



Document Path: F:\projects\0346\004-03\2016 Mitigation - New November Forward\Revised Mitigation Plan\MITIGATION PLAN_FIGURES\A7_DOWNSTREAMMITPROP.mxd

FIGURE A-7. DOWNSTREAM MITIGATION PROPOSAL

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

N

0 0.275 0.55 Miles

FIGURE 7 of 10

SOURCE: ESRI BASE DATA/TNRIS

DATE: 2/5/2018

USACE PROJECT NUMBER: SWF-2003-00336

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com

Tree Survey Points
Dam and Spillway
Mitigation Boundary - Aquatic Resources
Project Boundary
Conservation Pool

N

FM 904
SH 34
NORTH SULPHUR RIVER
FM 68
LADONIA

0 0.5 1 Miles

Tree density survey data on following page.

Document Path: F:\projects\0346\004-03\2016 Mitigation - New November Forward\Revised Mitigation Plan\MITIGATION PLAN_FIGURES\A8_TREESURVEYPTS.mxd

FIGURE A-8. TREE DENSITY SURVEY LOCATIONS

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

FIGURE 8 of 10

SOURCE: ESRI BASE DATA/TNRIS

DATE: 2/5/2018

USACE PROJECT NUMBER: SWF-2003-00336

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com

TREE DENSITY SURVEY DATA

Parcel #	Plot #	Sample Point	# Trees/Plot	# Trees/Acre	Avg Tree/Acre
73843	1	1	12	266	
73843	2	2	11	244	
73843	3	3	7	155	
73843	4	4	11	244	219
73843	5	5	7	155	
73843	6	6	12	266	
73843	7	7	8	177	
73843	8	8	11	244	
73796	1	9	13	288	
73796	2	10	22	488	
73796	3	11	13	288	
73796	4	12	7	155	299
73796	5	13	13	288	
73796	6	14	21	466	
73796	7	15	9	200	
73796	8	16	10	222	
73882	1	17	13	288	
73882	2	18	15	333	311
73882	3	19	14	311	
73882	4	20	14	311	
75199	1	21	7	155	
75199	2	22	7	155	
75199	3	23	7	155	169
75199	4	24	5	111	
75199	5	25	12	266	
76240	1	26	5	111	111
76301/76302	1	27	15	333	
76301/76303	2	28	12	266	
76301/76304	3	29	8	177	
76301/76305	4	30	14	311	230
76301/76306	5	31	8	177	
76301/76307	6	32	8	177	
76301/76308	7	33	10	222	
76301/76309	8	34	8	177	
78790	1	35	3	67	
78790	2	36	6	133	
78790	3	37	5	111	
78790	4	38	2	44	116
78790	5	39	9	200	
78790	6	40	6	133	
78790	7	41	7	155	
78790	8	42	4	89	
84754	1	43	9	200	
84754	2	44	6	133	
84754	3	45	10	222	
84754	4	46	8	177	
84754	5	47	3	67	148
84754	6	48	5	111	
84754	7	49	7	155	
84754	8	50	8	177	
84754	9	51	4	89	
83853	1	52	13	288	
83853	2	53	11	244	
83853	3	54	5	111	181
83853	4	55	5	111	
83853	5	56	10	222	
83853	6	57	5	111	

	trees/acre	trees/acre per parcel
TOTAL MEAN:	202	198
TOTAL MEDIAN:	177	181

TYPICAL CROSS-SECTION (NOT TO SCALE)

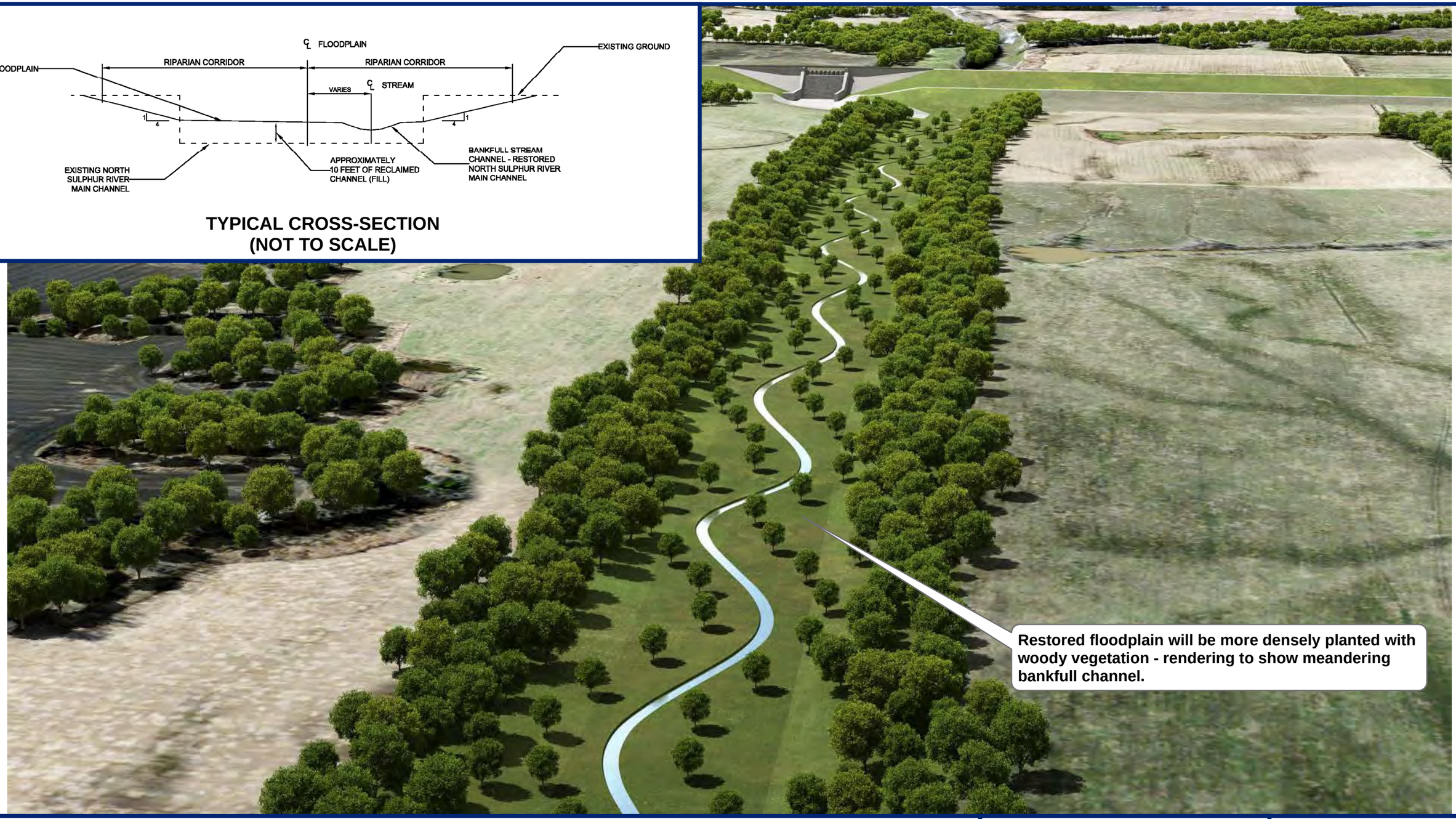


FIGURE A-9. CONCEPTUAL RENDERING OF RESTORED NORTH SULPHUR RIVER MAIN CHANNEL

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

FIGURE 9 of 10

SOURCE: ESRI BASE DATA/TNRIS

DATE: 2/5/2018

USACE PROJECT NUMBER: SWF-2003-00336

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com

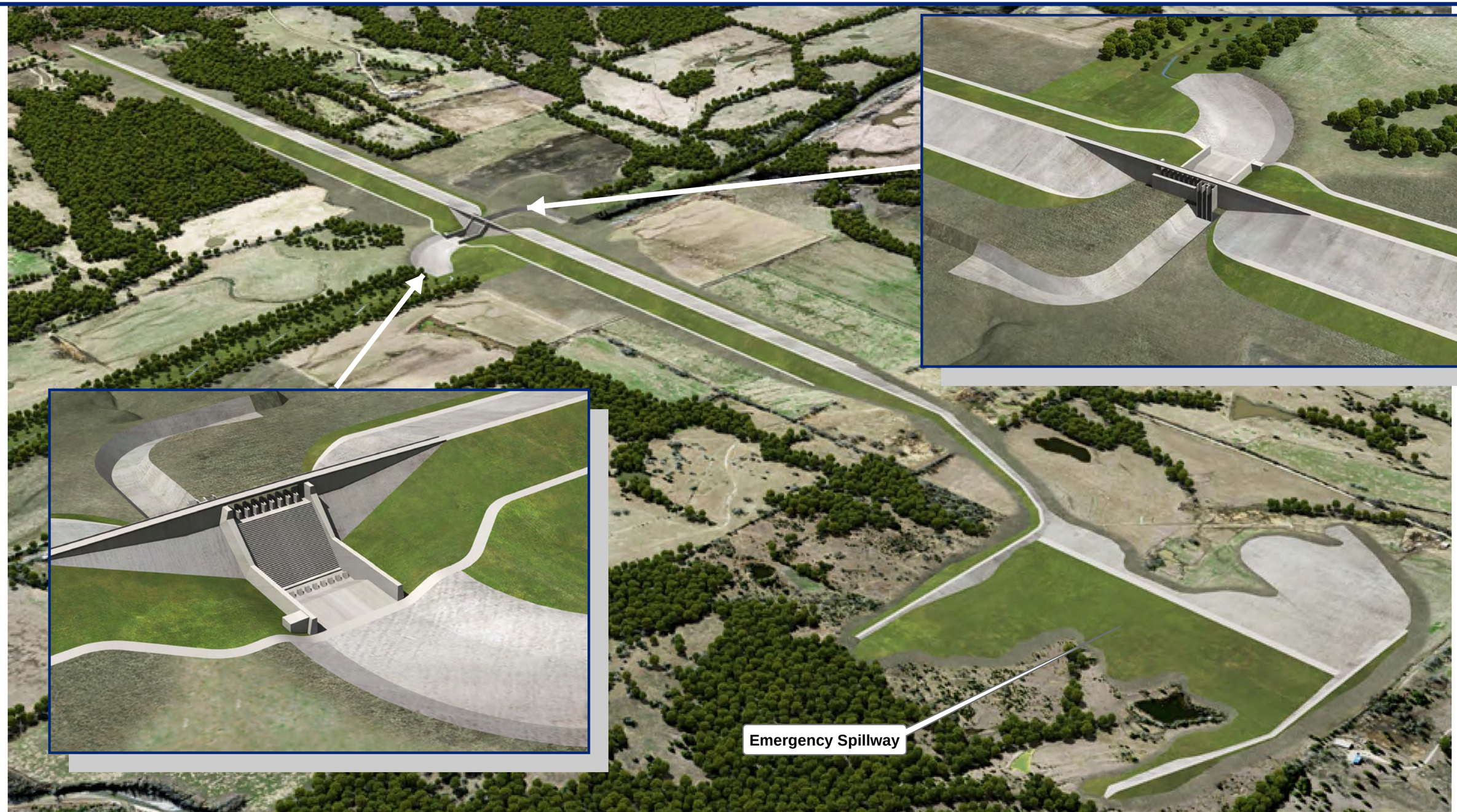


FIGURE A-10. CONCEPTUAL RENDERING OF DAM AND SPILLWAYS

PROPOSED LAKE RALPH HALL
UPPER TRINITY REGIONAL WATER DISTRICT
FANNIN COUNTY, TEXAS

FIGURE 10 of 10

SOURCE: ESRI BASE DATA/TNRIS

DATE: 2/5/2018

USACE PROJECT NUMBER: SWF-2003-00336

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. University Dr., Suite 300
Fort Worth, Texas 76107
(817) 806-1700
www.apaienv.com

Document Path: F:\projects\0348\004-03\2016 Mitigation - New November Forward\Revised Mitigation Plan\MITIGATION_PLAN_FIGURES\A10_DAMSPILLWAY.mxd

APPENDIX B

SUPPLEMENTAL JURISDICTIONAL DETERMINATION REPORT DATED JUNE 21, 2017;

APPROVED JURISDICTIONAL DETERMINATION LETTER FROM USACE DATED JULY 27, 2017

SUPPLEMENTAL REPORT IN SUPPORT OF REQUEST FOR APPROVED JURISDICTIONAL DETERMINATION OF WATERS OF THE UNITED STATES

Proposed Lake Ralph Hall

Fannin County, Texas

USACE Project No.: SWF-2003-00336

APPLICANT:

Upper Trinity Regional Water District

UPPER TRINITY
REGIONAL WATER DISTRICT

June 21, 2017

Prepared by:

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS • DESIGNERS • SCIENTISTS

Supplemental Report in Support of Request
for Approved Jurisdictional Determination of Waters of the United States
for the Proposed Lake Ralph Hall, Fannin County, Texas
US Army Corps of Engineers Project No.: SWF-2003-00336

1. Purpose

A letter, dated March 29, 2017, requesting an approved jurisdictional determination (AJD) for the portion of the proposed Lake Ralph Hall project site located in Fannin County, Texas was submitted by the Upper Trinity Regional Water District (UTRWD) to the U.S. Army Corps of Engineers (USACE). The purpose of this Supplemental Report is to respond to the USACE's request for additional information in support of UTRWD's request and to update and document the current conditions of aquatic resources within the proposed Lake Ralph Hall project area as well as to document aquatic resources within areas identified for potential mitigation. The previous documentation of aquatic resources was published in a Preliminary Jurisdictional Determination (PJD) report dated October 26, 2006.

Since the 2006 PJD report, the assessment area has experienced physical and administrative changes. These modifications include land use alterations by current land-owners; continued erosion and degradation of area streams; U.S. Army Corps of Engineer's guidance documents (subsequent to 2006); and design refinements associated with the dam/embankment structure, spillway system, intake structure and pump station, recent LIDAR data, and the addition of the mitigation assessment area.

The approximately 13,094-acre assessment area documented in this Supplemental Report includes:

- The 7,568-acre reservoir with a conservation pool set at elevation 551 feet above mean sea level;
- Embankment structure (dam);
- Spillway system;
- Intake structure and pump station;
- Project boundary representing +/- 560-feet elevation; and
- Area(s) identified as potential mitigation lands located downstream of dam to FM 904.

2. Methods

The 2006 PJD report utilized the following datasets:

- Aerial photographs flown 2003-2005
- US Geological Survey (USGS) topographic maps
    - Farmersville, Greenville NW, Celeste, Pike, Wolfe City, Gober, Ladonia, Honey Grove and Dodd city quadrangles
- Soil Survey Fannin County
- National Wetlands Inventory maps

- National Hydrography Dataset
- Field investigations conducted in 2005

For this Supplemental Report, the following datasets were utilized to identify and address modifications to the 2006 PJD report:

- Aerial photographs from 2014, 2015, and 2016
    - 2014 and 2016 Aerial photographs from the USDA Farm Service Agency's National Agricultural Inventory Program (1-meter resolution)
    - 2015 Texas Orthoimagery Project (0.5-meter resolution)
- Google Earth™ imagery from 1995, 2008, 2010, 2011, 2012, 2014, and 2015
    - Aquatic resource data converted to KMZ file structure for review in Google Earth

The higher resolution aerial photographs from 2014-2016 compared to those used in the 2006 PJD report facilitated in refinements of the previously identified (delineated) aquatic resources as well as identification in modifications to aquatic resources within the project area (erosional features, impoundments, etc.). These refinements to the delineated aquatic resources were performed as a "desktop" evaluation.

To ground-truth observations from the desktop evaluation, field investigations were performed May 30 through June 2, 2017 to assess a representative sample area of portions of the 13,094-acre assessment area. These "on the ground" assessments aided in verification of identified aquatic resources from the desktop evaluation as well as to map the limits of potential waters of the U.S.[1] identified both from the desktop evaluation and in the field. As an example, 14 of the 47 mapped on-channel ponds within the assessment area representing approximately 29.7 percent were investigated in the field. Lacustrine "fringe" wetland areas associated with the 14 on-channel ponds assessed in the field were observed and recorded in the field. The lacustrine wetlands, predominantly herbaceous emergent wetlands, represented approximately 3.4 acres of the 23.8 acres of the 14 on-channel ponds assessed or approximately 14.3 percent of the assessed on-channel pond acreage. This percentage of fringe wetlands was used to estimate the lacustrine wetland area associated with the total delineated area of on-channel impoundments within the assessment area that would be considered as hydraulically and hydrologically connected to waters of the U.S.

To refine mapping, waypoints recorded during the 2017 field investigation were cross-referenced with topographic maps (both LIDAR generated and USGS topographic maps) and aerial photographs to accurately determine the limits of waters of the U.S. within specific areas assessed for this Supplemental Report. In order to quantify the entire footprint for the proposed reservoir, Geographic Information System (GIS) technologies, specifically ESRI's ARCGIS 10.2, were used to identify various spectral signatures associated with the 2014, 2015, and 2016 aerial photographs. The signatures from the verified aquatic resources were then crossed-reference to comparable resources within inaccessible tracts to determine the limits of the

[1] Aquatic resources were recorded using a Garmin GPSMAP 78s with sub-3 meter accuracy; field tested to 5 feet accuracy.

aquatic resources for the entirety of the 13,094-acre assessment area; thereby, delineating the limits of aquatic resources for the entire Supplemental Report assessment area.

3. Results

As documented in the 2006 PJD report, historical channelization of the North Sulphur River and major tributaries has resulted in excessive erosion within the entirety of the North Sulphur River watershed. The consequence of this channelization is greatly enlarged channels with capacities to contain and convey greater than the 100-year flood flows. Accordingly, the stream channels within the 13,094 assessment area, to include the North Sulphur River, do not exhibit a floodplain – the stream channels do not overbank even in the most severe rain events. Therefore, wetland areas identified within the 13,094-acre assessment area, except for fringe lacustrine wetlands associated with on-channel impoundments, are not hydraulically or hydrologically connected to any stream channels. Approximately 3.8 acres of isolated forested wetlands were identified within the Supplemental Report assessment area. However, these wetlands do not contribute to the chemical, physical, and biological integrity of waters of the U.S. Consequently, the wetlands identified within the 13,094-acre assessment area, aside from those associated with on-channel lacustrine fringe wetlands, should be considered "isolated" and not subject to Section 404 of the Clean Water Act. The following tables summarize the delineated aquatic resources observed within the 13,094-acre assessment area.

Table 1: Summary of Delineated Stream Channels Within Assessment Area

Within Conservation Pool, Embankment, Spillway of Lake Ralph Hall		
Category	**Description**	**Linear Feet**
Stream Channel	Ephemeral 0.5 - 2.0' wide North Side	26,835
Stream Channel	Ephemeral 2.5 - 5.0' wide - North Side	88,309
Stream Channel	Ephemeral 6 - 15' wide - North Side	55,023
Stream Channel	Ephemeral 16 - 25' wide - North Side	3,949
Stream Channel	Ephemeral >25' wide - North Side	78,764
Stream Channel	Ephemeral 0.5 - 2.0' wide South Side	19,769
Stream Channel	Ephemeral 2.5 - 5.0' wide - South Side	66,967
Stream Channel	Ephemeral 6 - 15' wide - South Side	92,155
Stream Channel	Ephemeral 16 - 25' wide - South Side	5,321
Stream Channel	Ephemeral >25' wide - South Side	8,396
Stream Channel	Intermittent - North Sulphur River @ SH34	55,570
Sub-Total Channels		**501,058**

Outside Conservation Pool, Embankment, Spillway but within Assessment Area		
Category	**Description**	**Linear Feet**
Stream Channel	Ephemeral 0.5 - 2.0' wide North Side	11,513
Stream Channel	Ephemeral 0.5 - 2.0' wide North Side - Baker Creek Tribs	2,639
Stream Channel	Ephemeral 2.5 - 5.0' wide - North Side	22,872
Stream Channel	Ephemeral 2.5 - 5.0' wide - North side - Baker Creek Tribs	5,171
Stream Channel	Ephemeral 6 - 15' wide - North Side	13,037
Stream Channel	Ephemeral 16 - 25' wide - North Side	2,463
Stream Channel	Ephemeral >25' wide - North Side	11,897
Stream Channel	Ephemeral 0.5 - 2.0' wide South Side	22,690
Stream Channel	Ephemeral 2.5 - 5.0' wide - South Side	49,968
Stream Channel	Ephemeral 6 - 15' wide - South Side	37,535
Stream Channel	Ephemeral 16 - 25' wide - South Side	0
Stream Channel	Ephemeral >25' wide - South Side	0
Stream Channel	Intermittent - North Sulphur River - downstream of dam (FM 904)	6,387
Stream Channel	Intermittent - North Sulphur River - upstream of pool (FM 38)	3,689
Sub-Total Channels		**189,860**

Total Channels		**690,918**

TABLE 2: ON-CHANNEL PONDS (OCPs) SUMMARY

	ACRES	NUMBER	LOCATION
SUBTOTAL	56.19	33	CONSERVATION POOL (CP), DAM, SPILLWAY
SUBTOTAL	13.69	14	OUTSIDE CP, DAM, SPILLWAY
TOTAL	69.89	47	WITHIN ASSESSMENT AREA

Range in size from 0.04 acre to 23.8 acres

SIZE BREAKDOWN	
Small Ponds (≤ 1 acre):	32
Ponds (>1 acre but ≤ 5 acres):	13
Lakes (>5 acres but ≤500 acres):	2

Total # Within Assessment Area	Total # Assessed	Percentage of Total Assessed	Total Acreage of OCPs within Assessment Area	Total Acreage Assessed	Percentage of Total Acreage Assessed
47	14	29.7	69.9	23.8	34.0
Total # Within Conservation Pool/Dam/Spillway Area	# Assessed	Percentage of # Within Conservation Pool/Dam/Spillway Area Assessed	Total Acreage of OCPs within Conservation Pool/Dam/Spillway Area	Acreage of OCPs Assessed within Conservation Pool/Dam/Spillway Area	Percentage of Acreage within Conservation Pool/Dam/Spillway Area Assessed
33	13	39.4	56.2	21.4	38.1

Calculated Area of Lacustrine Fringe Wetlands

3.4 acres identified for 23.8 acres of 14 on-channel ponds field assessed = 14.3 percent
14.3 percent of 69.9 acres of 47 on-channel ponds within assessment area = 10 acres

TABLE 3: UPLAND PONDS (UPs) SUMMARY

	ACRES	NUMBER	LOCATION
SUBTOTAL	52.37	115	CONSERVATION POOL/DAM/SPILLWAY
SUBTOTAL	30.63	97	OUTSIDE CP/DAM/SPILLWAY
TOTAL	83.00	212	WITHIN ASSESSSMENT AREA

Range in size from 0.02 acre to 3.26 acres

SIZE BREAKDOWN	
Small Ponds (< 1 acre):	194
Ponds (>1 acre but < 5 acres):	18
Lakes (>5 acres but <500 acres):	0

TABLE 3: UPLAND PONDS SUMMARY (CONT.)

Total # Within Assessment Area	Total # Assessed	Percentage of Total Assessed	Total Acreage of UPs within Assessment Area	Total Acreage Assessed	Percentage of Total Acreage Assessed
212	20	9.4	83.0	23.2	28

Total # Within Conservation Pool/Dam/Spill way Area	# Assessed	Percentage of # Within Conservation Pool/Dam/Spill way Area Assessed	Total Acreage of UPs within Conservation Pool/Dam/Spill way Area	Acreage of UPs Assessed within Conservation Pool/Dam/Spill way Area	Percentage of Acreage within Conservation Pool/Dam/Spill way Area Assessed
115	10	8.7	52.4	13.2	25.2

A comprehensive summary of all delineated aquatic resources within the 13,094-acre assessment area is provided in Appendix A. Within Appendix A, summary tables detail the following aquatic resources:

- Streams
- Open waters
    - On-channel impoundments
    - Upland, isolated ponds[2]
- Isolated forested wetlands

Mapbooks of the delineated aquatic resources are included in Appendix B. The mapbooks detail the following aquatic resources delineated within the 13,094-acre assessment area:

- Overall Aquatic Resources Delineated
- Delineated Streams
- Delineated Open Waters
    - On-channel impoundments
    - Upland, isolated ponds
- Delineated Isolated Forested Wetlands

Wetland determination data forms for delineated but isolated aquatic resources are included in Appendix C with a mapbook showing the location of the wetland determination sampling points. Photographs of the resources recorded along the numerous sampling locations are included with the data forms. Finally, additional photographs from the 2017 on-site investigation of the open water aquatic resources within the 13,094-acre assessment area are provided in Appendix D.

[2] Ponds or open waters typically used for livestock.

APPENDIX A

AQUATIC RESOURCE SUMMARY TABLES

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
NSR	135.0	NORTH SULPHUR RIVER	>25'	Intermittent	CONSERVATION POOL, DAM, SPILLWAY	12,727
NSR	65.0	NORTH SULPHUR RIVER	>25'	Intermittent	OUTSIDE CP, DAM, SPILLWAY	3,689
NSR	150.0	NORTH SULPHUR RIVER	>25'	Intermittent	OUTSIDE CP, DAM, SPILLWAY	6,387
NSR	150.0	NORTH SULPHUR RIVER	>25'	Intermittent	CONSERVATION POOL, DAM, SPILLWAY	692
NSR	65.0	NORTH SULPHUR RIVER	>25'	Intermittent	CONSERVATION POOL, DAM, SPILLWAY	5,089
NSR	85.0	NORTH SULPHUR RIVER	>25'	Intermittent	CONSERVATION POOL, DAM, SPILLWAY	7,330
NSR	85.0	NORTH SULPHUR RIVER	>25'	Intermittent	CONSERVATION POOL, DAM, SPILLWAY	14,183
NSR	100.0	NORTH SULPHUR RIVER	>25'	Intermittent	CONSERVATION POOL, DAM, SPILLWAY	12,880
NSR	150.0	NORTH SULPHUR RIVER	>25'	Intermittent	CONSERVATION POOL, DAM, SPILLWAY	2,668
N1	85.0	STREAM N1 - MERRILL CREEK	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	24,057
N1	50.0	STREAM N1 - MERRILL CREEK	>25'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	521
N1-TRIB1	4.0	TRIBUTARY 1 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,171
N1-TRIB1	4.0	TRIBUTARY 1 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	514
N1-TRIB1	4.0	TRIBUTARY 1 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	878
N1-TRIB10	2.0	TRIBUTARY 10 TO MERRILL CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	782
N1-TRIB10	1.0	TRIBUTARY 10 TO MERRILL CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	171
N1-TRIB11	5.0	TRIBUTARY 11 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,020
N1-TRIB11-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	850
N1-TRIB12	3.5	TRIBUTARY 12 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,503
N1-TRIB12	2.0	TRIBUTARY 12 TO MERRILL CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	103
N1-TRIB13	2.0	TRIBUTARY 13 TO MERRILL CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,826
N1-TRIB13	2.0	TRIBUTARY 13 TO MERRILL CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	85
N1-TRIB13	5.0	TRIBUTARY 13 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	758
N1-TRIB14	5.0	TRIBUTARY 14 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,797
N1-TRIB14	3.0	TRIBUTARY 14 TO MERRILL CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	362
N1-TRIB14-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	202
N1-TRIB14-A1	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	246
N1-TRIB15	15.0	TRIBUTARY 15 TO MERRILL CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,412
N1-TRIB15	11.0	TRIBUTARY 15 TO MERRILL CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	919
N1-TRIB15-A1	8.0	SECONDARY TRIBUTARY	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	909
N1-TRIB15-A2	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	437
N1-TRIB15-A3	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	215
N1-TRIB15-A4	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	172

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
N1-TRIB15-A5	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	294
N1-TRIB15-A6	6.0	SECONDARY TRIBUTARY	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	507
N1-TRIB15-A6	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	137
N1-TRIB16	15.0	TRIBUTARY 15 TO MERRILL CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,380
N1-TRIB16-A1	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	173
N1-TRIB16-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	556
N1-TRIB16-A2	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	541
N1-TRIB16-A2	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	209
N1-TRIB16-A3	6.0	SECONDARY TRIBUTARY	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	572
N1-TRIB16-A3	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	756
N1-TRIB17	4.0	TRIBUTARY 17 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	906
N1-TRIB17	3.0	TRIBUTARY 17 TO MERRILL CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,325
N1-TRIB17-A1	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	273
N1-TRIB18	4.0	TRIBUTARY 18 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	242
N1-TRIB19	6.0	TRIBUTARY 19 TO MERRILL CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	518
N1-TRIB19	5.0	TRIBUTARY 19 TO MERRILL CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,379
N1-TRIB19-A1	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	281
N1-TRIB1-A1	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,519
N1-TRIB1-A1	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	629
N1-TRIB1-A2	2.5	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	346
N1-TRIB1-A4	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	126
N1-TRIB2	1.5	TRIBUTARY 2 TO MERRILL CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	793
N1-TRIB20	4.0	TRIBUTARY 20 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	56
N1-TRIB20	2.0	TRIBUTARY 20 TO MERRILL CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	144
N1-TRIB21	10.0	TRIBUTARY 21 TO MERRILL CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	207
N1-TRIB21	8.0	TRIBUTARY 21 TO MERRILL CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	698
N1-TRIB3	5.0	TRIBUTARY 3 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,965
N1-TRIB3	5.0	TRIBUTARY 3 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	521
N1-TRIB3	1.0	TRIBUTARY 3 TO MERRILL CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	390
N1-TRIB4	1.5	TRIBUTARY 4 TO MERRILL CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,361
N1-TRIB4	1.5	TRIBUTARY 4 TO MERRILL CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	639
N1-TRIB5	1.0	TRIBUTARY 5 TO MERRILL CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	667
N1-TRIB6	4.0	TRIBUTARY 6 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,393

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
N1-TRIB6	6.0	TRIBUTARY 6 TO MERRILL CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,365
N1-TRIB6	2.0	TRIBUTARY 6 TO MERRILL CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	367
N1-TRIB6	2.0	TRIBUTARY 9 TO MERRILL CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	86
N1-TRIB6-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	443
N1-TRIB6-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	487
N1-TRIB6-A2	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,999
N1-TRIB6-A3	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	866
N1-TRIB7	4.0	TRIBUTARY 7 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,532
N1-TRIB7-A1	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,059
N1-TRIB8	1.0	TRIBUTARY 8 TO MERRILL CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	356
N1-TRIB9	11.0	TRIBUTARY 9 TO MERRILL CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,053
N1-TRIB9	3.0	TRIBUTARY 9 TO MERRILL CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	4,486
N1-TRIB9	3.0	TRIBUTARY 9 TO MERRILL CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,253
N1-TRIB9-A1	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,250
N1-TRIB9-A1	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	415
N1-TRIB9-A2	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	973
N1-TRIB9-A3	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	502
N1-TRIB9-A4	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	462
N1-TRIB9-A5	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	304
N1-TRIB9-A6	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	289
N1-TRIB9-A6	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	264
N2	4.0	STREAM N2 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	199
N2	4.0	STREAM N2 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	442
N3	6.0	STREAM N3 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	924
N4	2.5	STREAM N4 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,676
N4	2.5	STREAM N4 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,030
N4	2.5	STREAM N4 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,207
N5	2.5	STREAM N5 - FMR NSR	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,840
N6	3.0	STREAM N6 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	939
N6	8.0	STREAM N6 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	5,427
N6	3.0	STREAM N6 - UNNAMED	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,851
N6	15.0	STREAM N6 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,255
N6	15.0	STREAM N6 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,021

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
N6	5.0	STREAM N6 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,152
N6-TRIB1	4.0	TRIBUTARY 1 TO STREAM N6	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,594
N6-TRIB1	2.0	TRIBUTARY 1 TO STREAM N6	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,180
N6-TRIB1	2.0	TRIBUTARY 1 TO STREAM N6	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	481
N6-TRIB1	2.0	TRIBUTARY 1 TO STREAM N6	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	945
N6-TRIB1	8.0	TRIBUTARY 1 TO STREAM N6	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,356
N6-TRIB1-A1	2.0	TRIB A1 TO TRIB 1 OF N6	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	137
N6-TRIB1-A3	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,015
N6-TRIB2	2.0	TRIBUTARY 2 TO STREAM N6	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,188
N6-TRIB2	2.0	TRIBUTARY 2 TO STREAM N6	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	441
N6-TRIB3	2.0	TRIBUTARY 3 TO STREAM N6	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	891
N6-TRIB4	1.0	TRIBUTARY 4 TO STREAM N6	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	581
N6-TRIB4	1.0	TRIBUTARY 4 TO STREAM N6	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	519
N6-TRIB5	2.0	TRIBUTARY 5 TO STREAM N6	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	550
N6-TRIB5	2.5	TRIBUTARY 5 TO STREAM N6	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	358
N6-TRIB5-A1	1.0	TRIB A1 TO TRIB 5 OF S-N6	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	205
N7	6.0	STREAM N7 - FMR BRALLEY POOL	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,859
N7-TRIB1	1.5	TRIBUTARY 1 TO STREAM N7	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	512
N8	80.0	STREAM N8 - BRALLEY POOL	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	18,514
N8	50.0	STREAM N8 - BRALLEY POOL	>25'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,250
N8-TRIB1	2.0	TRIBUTARY 1 TO BRALLEY POOL	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	485
N8-TRIB1	8.0	TRIBUTARY 1 TO BRALLEY POOL	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	448
N8-TRIB1	5.0	TRIBUTARY 1 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	446
N8-TRIB10	2.0	TRIBUTARY 10 TO BRALLEY POOL	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	454
N8-TRIB10	2.0	TRIBUTARY 10 TO BRALLEY POOL	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	650
N8-TRIB10-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	396
N8-TRIB11	2.0	TRIBUTARY 11 TO BRALLEY POOL	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	123
N8-TRIB2	6.0	TRIBUTARY 2 TO BRALLEY POOL	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,043
N8-TRIB2	3.0	TRIBUTARY 2 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	812
N8-TRIB3	5.0	TRIBUTARY 3 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,450
N8-TRIB3	5.0	TRIBUTARY 3 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	137
N8-TRIB3	5.0	TRIBUTARY 3 TO BRALLEY POOL	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	189
N8-TRIB4	5.0	TRIBUTARY 8 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	351

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
N8-TRIB5	4.0	TRIBUTARY 5 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,659
N8-TRIB5	4.0	TRIBUTARY 5 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	812
N8-TRIB5	4.0	TRIBUTARY 5 TO BRALLEY POOL	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	753
N8-TRIB5-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	423
N8-TRIB6	5.0	TRIBUTARY 6 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,509
N8-TRIB6	3.0	TRIBUTARY 6 TO BRALLEY POOL	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	269
N8-TRIB7	2.0	TRIBUTARY 7 TO BRALLEY POOL	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	557
N8-TRIB8	5.0	TRIBUTARY 8 TO BRALLEY POOL	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	297
N8-TRIB8	5.0	TRIBUTARY 8 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	140
N8-TRIB9	4.0	TRIBUTARY 9 TO BRALLEY POOL	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	935
N10	5.0	STREAM N10 - LEGGETS BRANCH	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	5,632
N10	5.0	STREAM N10 - LEGGETS BRANCH	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,754
N10	12.0	STREAM N10 - LEGGETS BRANCH	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,797
N10-TRIB1	3.0	TRIBUTARY 1 TO LEGGETS BRANCH	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,100
N10-TRIB1	3.0	TRIBUTARY 1 TO LEGGETS BRANCH	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	535
N10-TRIB2	5.0	TRIBUTARY 2 TO LEGGETS BRANCH	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,545
N10-TRIB2	5.0	TRIBUTARY 2 TO LEGGETS BRANCH	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	431
N10-TRIB3	3.0	TIRBUTARY 3 TO LEGGETS BRANCH	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	934
N11	5.0	STREAM N11 - FMR DAVIS CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,470
N12	15.0	STREAM N12 - DAVIS CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	10,152
N12	15.0	STREAM N12 - DAVIS CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,079
N12	65.0	STREAM N12 - DAVIS CREEK	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	5,435
N12-TRIB1	3.0	TRIBUTARY 1 TO DAVIS CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	680
N12-TRIB2	3.0	TRIBUTARY 2 TO DAVIS CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,403
N12-TRIB2	2.0	TRIBUTARY 2 TO DAVIS CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	992
N12-TRIB3	3.0	TRIBUTARY 3 TO DAVIS CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	599
N12-TRIB3	1.5	TRIBUTARY 3 TO DAVIS CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	759
N12-TRIB4	2.0	TRIBUTARY 4 TO DAVIS CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	717
N12-TRIB5	3.0	TRIBUTARY 5 TO DAVIS CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	206
N12-TRIB5	5.0	TRIBUTARY 5 TO DAVIS CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	612
N12-TRIB6	1.0	TRIBUTARY 6 TO DAVIS CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	165
N12-TRIB7	3.0	TRIBUTARY 7 TO DAVIS CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	457
N12-TRIB7	3.0	TRIBUTARY 7 TO DAVIS CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	139

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
N12-TRIB8	15.0	TRIBUTARY 8 TO DAVIS CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,350
N12-TRIB8	15.0	TRIBUTARY 8 TO DAVIS CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,575
N12-TRIB8-A1	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	169
N12-TRIB8-A1	5.0	TRIBUTARY 8 TO DAVIS CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	506
N12-TRIB9	5.0	TRIBUTARY 9 TO DAVIS CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	193
N13	5.0	STREAM N13 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,840
N13-TRIB1	0.5	TRIBUTARY 1 TO STREAM 13	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	456
N14	5.0	STREAM N14 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,578
N15	40.0	STREAM N15 - PICKLE CREEK	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	12,176
N15	15.0	STREAM N15 - PICKLE CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,925
N15	25.0	STREAM N15 - PICKLE CREEK	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,324
N15-TRIB1	5.0	TRIBUTARY 1 TO PICKLE CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,861
N15-TRIB1	2.0	TRIBUTARY 1 TO PICKLE CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,007
N15-TRIB1	4.0	TRIBUTARY 1 TO PICKLE CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,154
N15-TRIB1	2.0	TRIBUTARY 1 TO PICKLE CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,689
N15-TRIB1-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,623
N15-TRIB1-A2	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,244
N15-TRIB2	3.0	TRIBUTARY 2 TO PICKLE CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	849
N15-TRIB2	3.0	TRIBUTARY 2 TO PICKLE CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	594
N15-TRIB3	2.0	TRIBUTARY 3 TO PICKLE CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	46
N15-TRIB3	2.0	TRIBUTARY 3 TO PICKLE CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,304
N15-TRIB4	6.0	TRIBUTARY 4 TO PICKLE CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	769
N15-TRIB4-A1	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	390
N16	9.0	STREAM N16 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,408
N17	5.0	STREAM N17 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	176
N17	5.0	STREAM N17 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	915
N17	5.0	STREAM N17 - UNNAMED	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,037
N17-TRIB1	1.0	TRIBUTARY 1 TO N17	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	226
N18-TRIB3	2.0	TRIBUTARY 3 TO BRUSHY CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	298
N18	95.0	STREAM N18 - BRUSHY CREEK	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	9,474
N18	35.0	STREAM N18 - BRUSHY CREEK	>25'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	3,574
N18	40.0	STREAM N18 - BRUSHY CREEK	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,612
N18-TRIB1	0.5	TRIBUTARY 1 TO BRUSHY CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	452

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
N18-TRIB2	1.0	TRIBUTARY 2 TO BRUSHY CREEK	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,501
N18-TRIB2-A1	0.5	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	272
N18-TRIB4	3.0	TRIBUTARY 4 TO BRUSHY CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,222
N18-TRIB5	55.0	N18-TRIB5 - POT CREEK	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,614
N18-TRIB5	40.0	N18-TRIB5 - POT CREEK	>25'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,855
N18-TRIB5-A1	5.0	TRIBUTARY 1 TO POT CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,146
N18-TRIB5-A1	6.0	TRIBUTARY 1 TO POT CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,280
N18-TRIB6	2.0	TRIBUTARY 6 TO POT CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	272
N18-TRIB7	4.0	TRIBUTARY 7 TO POT CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	97
N19	3.5	STREAM N19 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	918
N20	15.0	STREAM N20 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,042
N20	5.0	STREAM N20 - FMR NSR	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,830
N20	8.0	STREAM N20 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,042
N20-TRIB1	3.0	TRIBUTARY 1 TO STREAM N20	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,288
N20-TRIB1	5.0	TRIBUTARY 1 TO STREAM N20	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,182
N20-TRIB1-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	166
N21	8.0	STREAM N21 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,300
N21	8.0	STREAM N21 - FMR NSR	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	801
N22	25.0	STREAM N22 - BEAR CREEK	16-25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,949
N22	25.0	STREAM N22 - BEAR CREEK	16-25'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,463
N22-TRIB1	3.0	TRIBUTARY 1 TO BEAR CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	182
N22-TRIB1	2.0	TRIBUTARY 1 TO BEAR CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	608
N22-TRIB2	7.0	TRIBUTARY 2 TO BEAR CREEK	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,676
N22-TRIB2	6.0	TRIBUTARY 2 TO BEAR CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,726
N22-TRIB3	5.0	TRIBUTARY 3 TO BEAR CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	226
N23	45.0	STREAM N23 - ALLEN CREEK	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,557
N23	45.0	STREAM N23 - ALLEN CREEK	>25'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,697
N24	10.0	STREAM N24 - UNNAMED	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	266
S1	15.0	STREAM S1 - FMR NSR	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,483
S1	15.0	STREAM S1 - FMR BAKER CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,448
S1-TRIB1	4.0	TRIBUTARY 1 TO STREAM S1	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,768
S2	15.0	STREAM S2 - FRM NSR	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,166
S2	15.0	STREAM S2 - FRM NSR	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	3,955

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
S2-TRIB1	6.0	TRIBUTARY 1 TO S2	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	5,676
S2-TRIB1	6.0	TRIBUTARY 1 TO S2	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,642
S2-TRIB1	15.0	TRIBUTARY 1 TO S2 (FMR NSR)	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,163
S2-TRIB1-A1	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,833
S2-TRIB1-A2	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,261
S2-TRIB1-A3	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,848
S2-TRIB1-A4	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	967
S2-TRIB1-A5	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	384
S2-TRIB1-A6	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	158
S2-TRIB2	5.0	TRIBUTARY 2 TO S2	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	8,398
S2-TRIB2-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	702
S2-TRIB2-A2	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	671
S2-TRIB2-A3	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,574
S2-TRIB2-A4	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	747
S2-TRIB3	10.0	TRIBUTARY 3 TO S2	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	10,645
S2-TRIB3	10.0	TRIBUTARY 3 TO S2	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	172
S2-TRIB3-A1	8.0	SECONDARY TRIB (FMR NSR)	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	247
S2-TRIB3-A10	2.5	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	10,645
S2-TRIB3-A2	6.0	SECONDARY TRIB (FMR NSR)	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	598
S2-TRIB3-A3	8.0	SECONDARY TRIB (FMR NSR)	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	210
S2-TRIB3-A4	10.0	HEDRICK BRANCH- S2-TRIB3-A4	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	7,884
S2-TRIB3-A4	6.0	HEDRICK BRANCH- S2-TRIB3-A4	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	532
S2-TRIB3-A4	2.0	HEDRICK BRANCH	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,163
S2-TRIB3-A4	2.0	HEDRICK BRANCH	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	461
S2-TRIB3-A4-TribA	2.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,202
S2-TRIB3-A4-TribA	1.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	99
S2-TRIB3-A4-TribB	2.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	355
S2-TRIB3-A4-TribB	1.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	210
S2-TRIB3-A4-TribB	1.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	334
S2-TRIB3-A4-TribC	3.0	TRIBUTARY TO HEDRICK BRANCH	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	446
S2-TRIB3-A4-TribC	2.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	240
S2-TRIB3-A4-TribD	2.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	116
S2-TRIB3-A4-TribD	2.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	292

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
S2-TRIB3-A4-TribE	2.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	401
S2-TRIB3-A4-TribE	2.0	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	112
S2-TRIB3-A5	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	4,152
S2-TRIB3-A5-TribA	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	574
S2-TRIB3-A5-TribB	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	697
S2-TRIB3-a6	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,209
S2-TRIB3-A7	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,280
S2-TRIB3-A8	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	762
S2-TRIB3-A9	0.5	TRIBUTARY TO HEDRICK BRANCH	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	58
S2-TRIB3-A9	2.5	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	367
S4	5.0	STREAM S4 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	5,497
S4	2.5	STREAM S4 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	326
S4	2.0	STREAM S4 - UNNAMED	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	589
S4	10.0	STREAM S4 - FRM NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,665
S4-TRIB1	10.0	TRIBUTARY 1 TO S4 (FMR NSR)	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,853
S4-TRIB2	6.0	TRIBUTARY 2 TO S4	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,403
S4-TRIB3	4.0	TRIBUTARY 3 TO S4	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,078
S4-TRIB3	3.0	TRIBUTARY 3 TO S4	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,496
S4-TRIB3	2.0	TRIBUTARY 3 TO S4	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	359
S4-TRIB4	2.0	TRIBUTARY 4 TO S4	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	601
S5	2.0	STREAM S5 - FMR NSR	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	864
S6	6.0	STREAM S6 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,262
S7	6.0	STREAM S7 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	656
S8	15.0	STREAM S8 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,970
S8	3.0	STREAM S8 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,457
S8	2.0	STREAM S8 - UNNAMED	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	515
S8	5.0	STREAM S8 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,139
S8-TRIB1	2.5	TRIBUTARY 1 TO S8	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,106
S8-TRIB1	2.5	TRIBUTARY 1 TO S8	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	121
S8-TRIB2	2.0	TRIBUTARY 2 TO S8	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	602
S8-TRIB3	2.0	TRIBUTARY 3 TO S8	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	170
S8-TRIB3	2.0	TRIBUTARY 3 TO S8	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	501
S8-TRIB4	2.0	TRIBUTARY 4 TO S8	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	830

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
S8-TRIB4	2.0	TRIBUTARY 4 TO S8	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	307
S8-TRIB4-A1	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	161
S8-TRIB4-A1	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	123
S8-TRIB4-A2	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	288
S8-TRIB5	2.0	TRIBUTARY 5 TO S8	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	922
S8-TRIB6	0.5	TRIBUTARY 6 TO S8	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	214
S8-TRIB6	0.5	TRIBUTARY 6 TO S8	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	132
S8-TRIB7	2.0	TRIBUTARY 8 TO S8	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	348
S8-TRIB7	2.0	TRIBUTARY 8 TO S8	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	356
S9	15.0	STREAM 9 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	5,197
S9	5.0	STREAM 9 - UNNAMED	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,085
S9	5.0	STREAM 9 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,034
S9-TRIB1	2.0	TRIBUTARY 1 TO S9	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	309
S10	11.0	STREAM S10 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	6,658
S10-TRIB1	5.0	TRIBUTARY 1 TO S10	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	7,271
S10-TRIB1	5.0	TRIBUTARY 1 TO S10	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	899
S10-TRIB1-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	890
S10-TRIB1-A1	0.5	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	421
S10-TRIB1-A2	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	359
S10-TRIB1-A2	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,150
S10-TRIB2	1.5	TRIBUTARY 2 TO S10	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,705
S11	6.0	STREAM S11 - FMR BRALLEY POOL	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	345
S12	11.0	STREAM S12 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	6,304
S12	5.0	STREAM S12 - UNNAMED	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,801
S12	5.0	STREAM S12 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	6,304
S12	8.0	STREAM S12 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	6,304
S12-TRIB1	6.0	TRIBUTARY 1 TO S12	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	599
S12-TRIB2	11.0	TRIBUTARY 2 TO S12- FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	919
S12-TRIB3	3.0	TRIBUTARY 3 TO S12	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,285
S12-TRIB3-A1	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	388
S12-TRIB3-A2	0.5	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	249
S12-TRIB4	5.0	TRIBUTARY 4 TO S12	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,698
S12-TRIB4	2.0	TRIBUTARY 4 TO S12	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	540

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
S12-TRIB5	0.5	TRIBUTARY 5 TO S12	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	920
S12-TRIB5	0.5	TRIBUTARY 5 TO S12	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	780
S12-TRIB5-A1	0.5	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	213
S12-TRIB6	0.5	TRIBUTARY 6 TO S12	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	415
S12-TRIB6	0.5	TRIBUTARY 6 TO S12	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	619
S12-TRIB7	2.5	TRIBUTARY 7 TO S12	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	938
S12-TRIB7-A1	0.5	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,042
S12-TRIB7-A2	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	253
S12-TRIB7-A3	0.5	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	156
S13	5.0	STREAM S13 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	750
S14	10.0	STREAM S14 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,629
S14-TRIB1	8.0	TRIB 1 TO S14- FMR LEGGETS BR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,336
S15	10.0	STREAM S15 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	7,294
S15-TRIB1	5.0	TRIBUTARY 1 TO S15	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	5,502
S15-TRIB1	2.0	TRIBUTARY 1 TO S15	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	175
S15-TRIB1	2.0	TRIBUTARY 1 TO S15	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	83
S15-TRIB1	2.0	TRIBUTARY 1 TO S15	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	676
S15-TRIB1-A1	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,790
S15-TRIB1-A1	2.5	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,346
S15-TRIB2	4.0	TRIBUTARY 2 TO S15	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,010
S15-TRIB2	6.0	TRIBUTARY 2 TO S15	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	896
S15-TRIB2-A1	6.0	SECONDARY TRIBUTARY	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	6,660
S15-TRIB2-A1	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,391
S15-TRIB2-A2	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	367
S15-TRIB2-A2	4.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	790
S15-TRIB2-A3	2.5	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	408
S15-TRIB3	2.0	TRIBUTARY 3 TO S15	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	5,257
S15-TRIB3	2.0	TRIBUTARY 3 TO S15	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	942
S15-TRIB3-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	190
S15-TRIB4	5.0	TRIB 4 TO S15- FMR DAVIS CREEK	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,037
S16	40.0	STREAM S16 - UNNAMED	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	7,810
S16	10.0	STREAM S16 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,310
S16	8.0	STREAM S16 - UNNAMED	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,071

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
S16	25.0	STREAM S16 - UNNAMED	16-25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,151
S16-TRIB1	8.0	TRIB 1 TO S16 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,619
S16-TRIB2	8.0	TRIB 2 TO S16 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,832
S16-TRIB3	3.0	TRIBUTARY 3 TO S16	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,177
S16-TRIB3	5.0	TRIBUTARY 3 TO S16	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	316
S16-TRIB3-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	165
S16-TRIB3-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	345
S16-TRIB3-A2	1.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	128
S16-TRIB4	5.0	TRIBUTARY 4 TO S16	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,423
S16-TRIB4	5.0	TRIBUTARY 4 TO S16	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	112
S16-TRIB4-A1	5.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	140
S16-TRIB5	2.0	TRIBUTARY 5 TO S16	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	224
S16-TRIB5	2.0	TRIBUTARY 5 TO S16	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	562
S16-TRIB6	5.0	TRIBUTARY 6 TO S16	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	883
S16-TRIB6	5.0	TRIBUTARY 6 TO S16	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	435
S16-TRIB6-A1	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	117
S16-TRIB6-A1	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	47
S16-TRIB7	5.0	TRIBUTARY 7 TO S16	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,592
S16-TRIB7	5.0	TRIBUTARY 7 TO S16	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	523
S16-TRIB7-A1	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	211
S16-TRIB7-A1	3.0	SECONDARY TRIBUTARY	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	154
S16-TRIB8	10.0	TRIBUTARY 8 TO S16	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	847
S16-TRIB8	10.0	TRIBUTARY 8 TO S16	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	520
S16-TRIB8-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	161
S16-TRIB9	4.0	TRIBUTARY 9 TO S16	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	144
S17	5.0	STREAM S17 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,507
S18	5.0	STREAM S18 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,764
S18	5.0	STREAM S18 - UNNAMED	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	927
S18-TRIB1	2.0	TRIBUTARY 1 TO S18	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	160
S19	12.0	STREAM S19 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	8,197
S19	12.0	STREAM S19 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	884
S19	12.0	STREAM S19 - UNNAMED	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,221
S19	4.0	STREAM S19 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	631

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
S19-TRIB1	4.0	TRIBUTARY 1 TO S19	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	108
S19-TRIB1	4.0	TRIBUTARY 1 TO S19	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	498
S19-TRIB1-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	63
S19-TRIB2	4.0	TRIBUTARY 2 TO S19	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	249
S19-TRIB2	2.5	TRIBUTARY 2 TO S19	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	93
S19-TRIB2-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	143
S19-TRIB3	4.0	TRIBUTARY 3 TO S19	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	282
S19-TRIB4	5.0	TRIBUTARY 4 TO S19	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	255
S19-TRIB5	10.0	TRIBUTARY 5 TO S19	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	663
S20	12.0	STREAM S20 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	4,451
S20-TRIB1	8.0	TRIB 1 TO S20 - FMR NSR	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	967
S21	5.0	STREAM S21 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	3,683
S21	5.0	STREAM S21 - UNNAMED	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,727
S21	15.0	STREAM S21 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	897
S21	40.0	STREAM S21 - UNNAMED	>25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	586
S21	25.0	STREAM S21 - UNNAMED	16-25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	440
S21-TRIB1	4.0	TRIBUTARY 1 TO S21	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,469
S21-TRIB1	2.0	TRIBUTARY 1 TO S21	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,022
S21-TRIB1	8.0	TRIBUTARY 1 TO S21	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	226
S21-TRIB1	2.0	TRIBUTARY 1 TO S21	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	420
S21-TRIB1-A1	2.0	SECONDARY TRIBUTARY	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	275
S21-TRIB2	4.0	TRIBUTARY 2 TO S21	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	518
S22	8.0	STREAM S22 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	1,551
S22	5.0	STREAM S22 - UNNAMED	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,366
S22	22.0	STREAM S22 - UNNAMED	16-25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	958
S22	15.0	STREAM S22 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	904
S22-TRIB1	5.0	TRIBUTARY 1 TO S22	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	144
S22-TRIB2	3.0	TRIBUTARY 2 TO S22	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	263
S23	4.0	STREAM S23 - UNNAMED	2.5-5'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	298
S24	2.0	STREAM S24 - UNNAMED	0.5-2'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	130
S24	2.0	STREAM S24 - UNNAMED	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	143
S25	22.0	STREAM S25 - LONG CREEK	16-25'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	2,772
S25	15.0	STREAM S25 - LONG CREEK	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	3,092

TABLE A-1: COMPREHENSIVE LISTING OF STREAM CHANNELS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Width at OHWM (feet)	AQUATIC_RESOURCE	Category	Classification	LOCATION	Length (L.F.)
S25-TRIB1	5.0	TRIBUTARY 1 TO S25	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	194
S26	15.0	STREAM S26 - UNNAMED	6-15'	Ephemeral	CONSERVATION POOL, DAM, SPILLWAY	633
S26	15.0	STREAM S26 - UNNAMED	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,922
S26-TRIB1	12.0	TRIBUTARY 1 TO S26	6-15'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	110
S27	2.0	STREAM S27 - UNNAMED	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	176
T1-BAKER	2.0	TRIBUTARY 1 TO BAKER CREEK	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	888
T2-BAKER	5.0	TRIBUTARY 2 TO BAKER CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,455
T2-BAKER	5.0	TRIBUTARY 2 TO BAKER CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	541
T3-BAKER	5.0	TRIBUTARY 3 TO BAKER CREEK	2.5-5'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	2,175
T3-TRIB1	2.0	TRIBUTARY 1 TO T3 (BAKER)	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	1,422
T3-TRIB2	2.0	TRIBUTARY 2 TO T3 (BAKER)	0.5-2'	Ephemeral	OUTSIDE CP, DAM, SPILLWAY	330

Notes:

1. Secondary Tributaries are headwater streams; all tributaries to the North Sulphur River are ephemeral.
2. Category refers to the categorical breakdown used for the functional assessment.
3. Streams identified as location "CONSERVATION POOL, DAM, SPILLWAY" are those that will be impacted by the proposed reservoir; those identified as "OUTSIDE CP, DAM, SPILL are located outside the direct impact or proposed inundation zone.

TABLE A-2: COMPREHENSIVE LISTING OF ON-CHANNEL PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
OCP-1	0.23	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-2	1.39	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-3	1.25	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-4	1.34	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-5	0.92	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-6	0.43	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-7	0.30	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-8	0.89	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-9	0.29	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-10	2.89	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-11	0.26	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-12	1.08	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-13	2.02	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-14	0.66	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-15	0.04	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-16	23.80	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-17	7.98	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-18	0.28	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-19	0.35	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-20	0.36	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-21	0.77	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-22	0.04	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-23	2.44	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	YES
OCP-24	2.73	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-25	0.09	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-26	1.44	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-27	0.67	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	

OCP-28	0.04	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-29	0.35	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-30	0.49	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-31	0.12	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-32	0.91	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-33	0.87	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	YES
OCP-34	0.05	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-35	2.10	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-36	0.82	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-37	0.17	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-38	0.23	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-39	0.20	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-40	0.25	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-41	0.06	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-42	0.29	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-43	1.57	ON-CHANNEL	CONSERVATION POOL, DAM, SPILLWAY	
OCP-44	0.40	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-45	4.23	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-46	0.07	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	
OCP-47	1.73	ON-CHANNEL	OUTSIDE CP, DAM, SPILLWAY	

TABLE A-3: COMPREHENSIVE LISTING OF UPLAND PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Area	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
UP-1	5749.93289366662	0.13	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-2	14776.10593564570	0.34	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-3	6084.60531711844	0.14	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-4	7667.42748722571	0.18	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-5	5445.17498596262	0.13	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-6	44374.52643744630	1.02	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-7	44067.57979549830	1.01	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-8	65287.76828248820	1.50	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-9	5363.57710456971	0.12	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-10	7795.15740680175	0.18	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-11	2643.19015284152	0.06	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-12	5226.20293474051	0.12	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-13	41168.29833695940	0.95	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-14	5477.45276976329	0.13	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-15	12659.92091193530	0.29	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-16	7330.57549689765	0.17	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-17	24395.24800907620	0.56	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-18	27391.15975638290	0.63	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-19	52907.92946536180	1.21	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-20	9902.35635071872	0.23	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-21	15111.06680104190	0.35	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-22	46527.35755966390	1.07	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-23	797.58196692705	0.02	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-24	8495.21629000281	0.20	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-25	6549.82883570092	0.15	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-26	4559.62026730517	0.10	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-27	3521.52381836461	0.08	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	

TABLE A-3: COMPREHENSIVE LISTING OF UPLAND PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Area	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
UP-28	2166.55304437921	0.05	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-29	3035.48077934727	0.07	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-30	61766.50101570330	1.42	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-31	10336.68453382850	0.24	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-32	12104.72091771350	0.28	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-33	5710.68774594861	0.13	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-34	12279.67661202560	0.28	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-35	14643.16593454710	0.34	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-36	14385.73938026280	0.33	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP37	55021.50954727790	1.26	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-38	20590.62828086940	0.47	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-39	19561.69056842070	0.45	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-40	6455.81216071296	0.15	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-41	17048.07932788080	0.39	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-42	14969.51168506640	0.34	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-43	36354.11922479710	0.83	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-44	21445.17359571030	0.49	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-45	9180.99893449469	0.21	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-46	1103.39855550765	0.03	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-47	19170.67856177910	0.44	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-48	2299.15519237406	0.05	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-49	85001.84472518930	1.95	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-50	4137.24645104530	0.09	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-51	6348.52350473545	0.15	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-52	3863.23936248110	0.09	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-53	9630.02998032100	0.22	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-54	4658.89157283163	0.11	UPLAND	OUTSIDE CP, DAM, SPILLWAY	

TABLE A-3: COMPREHENSIVE LISTING OF UPLAND PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Area	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
UP-55	3936.40216217252	0.09	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-56	8199.42546201255	0.19	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-57	6845.73533303709	0.16	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-58	20274.16587430800	0.47	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-59	3183.47904889830	0.07	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-60	10623.76889474000	0.24	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-61	2653.67452166423	0.06	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-62	5787.51623979779	0.13	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-63	11898.73175653820	0.27	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-64	18118.49831442040	0.42	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-65	75580.65070826670	1.74	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-66	12613.58579890770	0.29	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-67	139318.06422272500	3.20	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-68	30755.94007771960	0.71	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-69	118404.81492646900	2.72	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-70	141835.79253150500	3.26	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-71	21789.36291595860	0.50	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-72	30024.69678235630	0.69	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-73	17143.04601182540	0.39	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-74	20834.37788618280	0.48	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-75	16576.56575557130	0.38	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-76	9010.26669794560	0.21	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-77	8454.17375371381	0.19	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-78	18478.28610318230	0.42	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-79	55001.29285508770	1.26	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-80	40401.63517133800	0.93	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-81	24265.07158389500	0.56	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	

TABLE A-3: COMPREHENSIVE LISTING OF UPLAND PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Area	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
UP-82	18550.96426231230	0.43	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-83	18478.47302847120	0.42	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-84	5844.00883298352	0.13	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-85	10355.89554570770	0.24	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-86	5170.39830100300	0.12	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-87	5401.63816966830	0.12	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-88	15936.36359196550	0.37	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-89	45857.66978273610	1.05	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-90	10965.39600756480	0.25	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-91	36241.31267953610	0.83	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-92	3786.61994385967	0.09	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-93	17185.08394543650	0.39	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-94	11604.22947008530	0.27	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-95	11891.00590485030	0.27	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-96	17665.12722604030	0.41	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-97	10728.32036732410	0.25	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-98	8289.64952167681	0.19	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-99	39083.10400375720	0.90	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-100	8347.63399821775	0.19	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-101	5266.05464633046	0.12	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-102	4354.98639745040	0.10	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-103	4021.79587792762	0.09	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-104	4798.10881939080	0.11	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-105	3459.42001635279	0.08	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-106	11768.16047437200	0.27	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-107	6105.62331010071	0.14	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-108	2832.77661245773	0.07	UPLAND	OUTSIDE CP, DAM, SPILLWAY	

TABLE A-3: COMPREHENSIVE LISTING OF UPLAND PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Area	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
UP-109	7052.05191829185	0.16	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-110	8194.71238320045	0.19	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-111	4110.84931272125	0.09	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-112	4810.11951610585	0.11	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-113	7424.49241898459	0.17	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-114	6283.01295944616	0.14	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-115	5345.78404822542	0.12	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-116	23374.28116171110	0.54	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-117	111064.03917599500	2.55	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-118	6343.53955999261	0.15	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-119	1397.41525163971	0.03	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-120	3897.22299127545	0.09	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-121	5807.40017322037	0.13	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-122	15656.61709553440	0.36	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-123	20356.44269192610	0.47	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-124	16667.22191647740	0.38	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-125	12752.32958181670	0.29	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-126	7957.79173974480	0.18	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-127	12810.60518978430	0.29	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-128	17230.78086344470	0.40	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-129	10874.46351666530	0.25	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-130	113763.45818804600	2.61	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-131	3247.51574886974	0.07	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-132	37105.84872792770	0.85	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-133	4862.23489564972	0.11	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-134	7698.36699848759	0.18	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-135	20985.62569117680	0.48	UPLAND	OUTSIDE CP, DAM, SPILLWAY	

TABLE A-3: COMPREHENSIVE LISTING OF UPLAND PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Area	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
UP-136	17021.25520376360	0.39	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-137	6550.40534372715	0.15	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-138	10047.14439513660	0.23	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-139	9039.54669314232	0.21	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-140	13637.30271152800	0.31	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-141	22417.53855222470	0.51	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-142	10207.16536974260	0.23	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-143	7439.02116688766	0.17	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-144	5119.84231584078	0.12	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-145	16469.97398403580	0.38	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-146	14736.25650770240	0.34	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-147	6047.08084001727	0.14	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-148	2668.79230187115	0.06	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-149	8437.40580385029	0.19	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-150	6289.61301144133	0.14	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-151	4888.92101482900	0.11	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-152	35600.09409247170	0.82	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-153	27720.25236598170	0.64	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-154	7160.29294855238	0.16	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-155	53881.45848935600	1.24	UPLAND	OUTSIDE CP, DAM, SPILLWAY	YES
UP-156	3939.21043664444	0.09	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-157	20751.92739753650	0.48	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-158	9985.24540552999	0.23	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-159	3736.21591783283	0.09	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-160	29329.89575577390	0.67	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-161	3073.94361451410	0.07	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-162	8281.96735182690	0.19	UPLAND	OUTSIDE CP, DAM, SPILLWAY	

TABLE A-3: COMPREHENSIVE LISTING OF UPLAND PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Area	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
UP-163	9835.77990840870	0.23	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-164	19545.81027028590	0.45	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-165	6542.04904715384	0.15	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-166	21269.03972328630	0.49	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-167	10652.93861573870	0.24	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-168	9642.29917074536	0.22	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-169	8663.92643204764	0.20	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-170	9964.32312719102	0.23	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-171	19247.05821770120	0.44	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-172	2044.50787395755	0.05	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-173	6372.06907281436	0.15	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-174	6909.98575295682	0.16	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-175	3134.09413745102	0.07	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-176	21212.67650165310	0.49	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-177	26594.00323073780	0.61	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-178	14828.91422201880	0.34	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-179	15976.15008071030	0.37	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-180	84402.45109275030	1.94	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-181	6217.56364225019	0.14	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-182	7702.00377304686	0.18	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-183	3914.01837309213	0.09	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-184	3606.38512229550	0.08	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-185	7021.77707892329	0.16	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-186	8201.61545048703	0.19	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-187	7947.64568713224	0.18	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-188	13104.04289911410	0.30	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-189	8160.57438649750	0.19	UPLAND	OUTSIDE CP, DAM, SPILLWAY	

TABLE A-3: COMPREHENSIVE LISTING OF UPLAND PONDS FOR PROPOSED LAKE RALPH HALL SUPPLEMENTAL JURISDICTIONAL DETERMINATION ASSESSMENT AREA

ID_NAME	Area	ACRES	CLASSIFICATION	LOCATION	FIELD ASSESSED
UP-190	10198.50191368740	0.23	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-191	3824.14907030134	0.09	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-192	1337.50624657386	0.03	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-193	11815.25335188270	0.27	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-194	4410.15219154655	0.10	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-195	8515.65792981320	0.20	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-196	6223.09084206837	0.14	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-197	4378.14482794999	0.10	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-198	13909.68330520210	0.32	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-199	10582.61482636130	0.24	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-200	11184.30844984010	0.26	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-201	25508.96048843180	0.59	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-202	7357.88909610137	0.17	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-203	7969.55461077115	0.18	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-204	15773.49419408670	0.36	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-205	8418.02173846706	0.19	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-206	11038.13115218060	0.25	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-207	2069.01868681123	0.05	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	YES
UP-208	13112.45451321330	0.30	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-209	851.00082011049	0.02	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-210	12970.03148441680	0.30	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	
UP-211	11123.23078719850	0.26	UPLAND	OUTSIDE CP, DAM, SPILLWAY	
UP-212	18086.88422204470	0.42	UPLAND	CONSERVATION POOL, DAM, SPILLWAY	

TABLE A-4: NON-JURISDICTIONAL FORESTED WETLANDS

NAME	Acres	Location
FW-1	0.85	Embankment/Assessment Area
FW-2	0.09	Conservation Pool
FW-3	0.06	Conservation Pool
FW-4	0.06	Conservation Pool
FW-5	0.02	Conservation Pool
FW-6	0.05	Conservation Pool
FW-7	0.10	Conservation Pool
FW-8	0.01	Conservation Pool
FW-9	0.09	Conservation Pool
FW-10	0.38	Conservation Pool
FW-11	0.04	Conservation Pool
FW-12	0.39	Conservation Pool
FW-13	1.17	Conservation Pool
FW-14	0.01	Conservation Pool
FW-15	0.01	Conservation Pool
FW-16	0.03	Conservation Pool
FW-17	0.02	Conservation Pool
FW-18	0.11	Conservation Pool
FW-19	0.01	Conservation Pool
FW-20	0.03	Conservation Pool
FW-21	0.01	Conservation Pool
FW-22	0.01	Conservation Pool
FW-23	0.05	Conservation Pool
FW-24	0.04	Conservation Pool
FW-25	0.14	Conservation Pool
FW-26	0.03	Conservation Pool
TOTAL	3.80	

MAPBOOK

OVERALL AQUATIC RESOURCES

STREAM LOCATION
- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE
- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

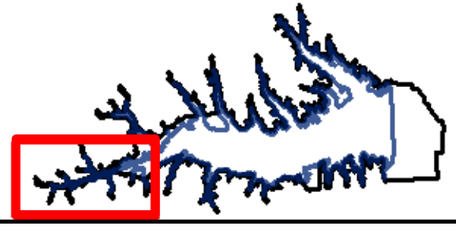


FIGURE 1: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

STREAM LOCATION

- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE

- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

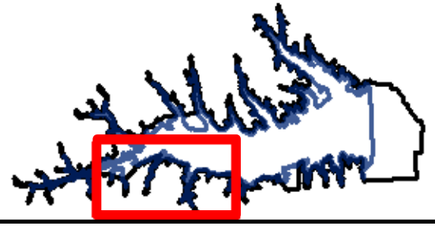


FIGURE 2: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

STREAM LOCATION

- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE

- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

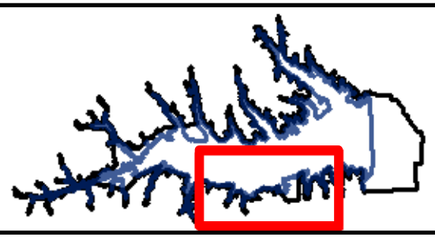


FIGURE 3: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

STREAM LOCATION
- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE
- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

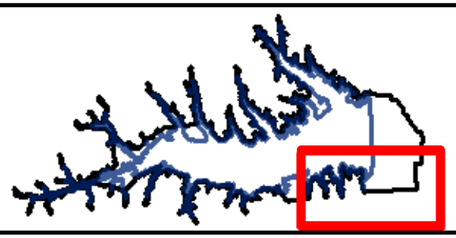


FIGURE 4: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

STREAM LOCATION

- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE

- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

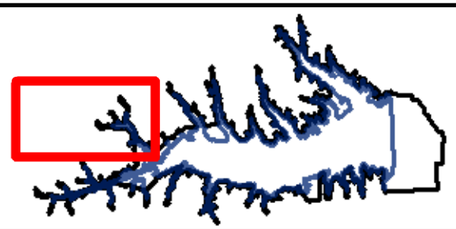


FIGURE 5: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

STREAM LOCATION

- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE

- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

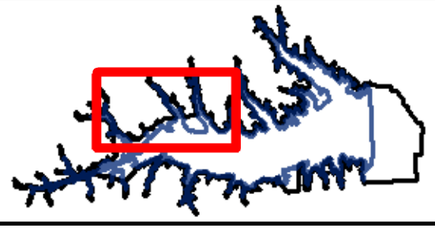


FIGURE 6: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

STREAM LOCATION
- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE
- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

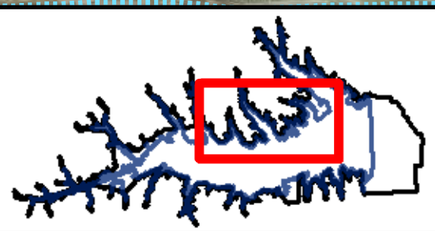


FIGURE 7: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

STREAM LOCATION
- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE
- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

FIGURE 8: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

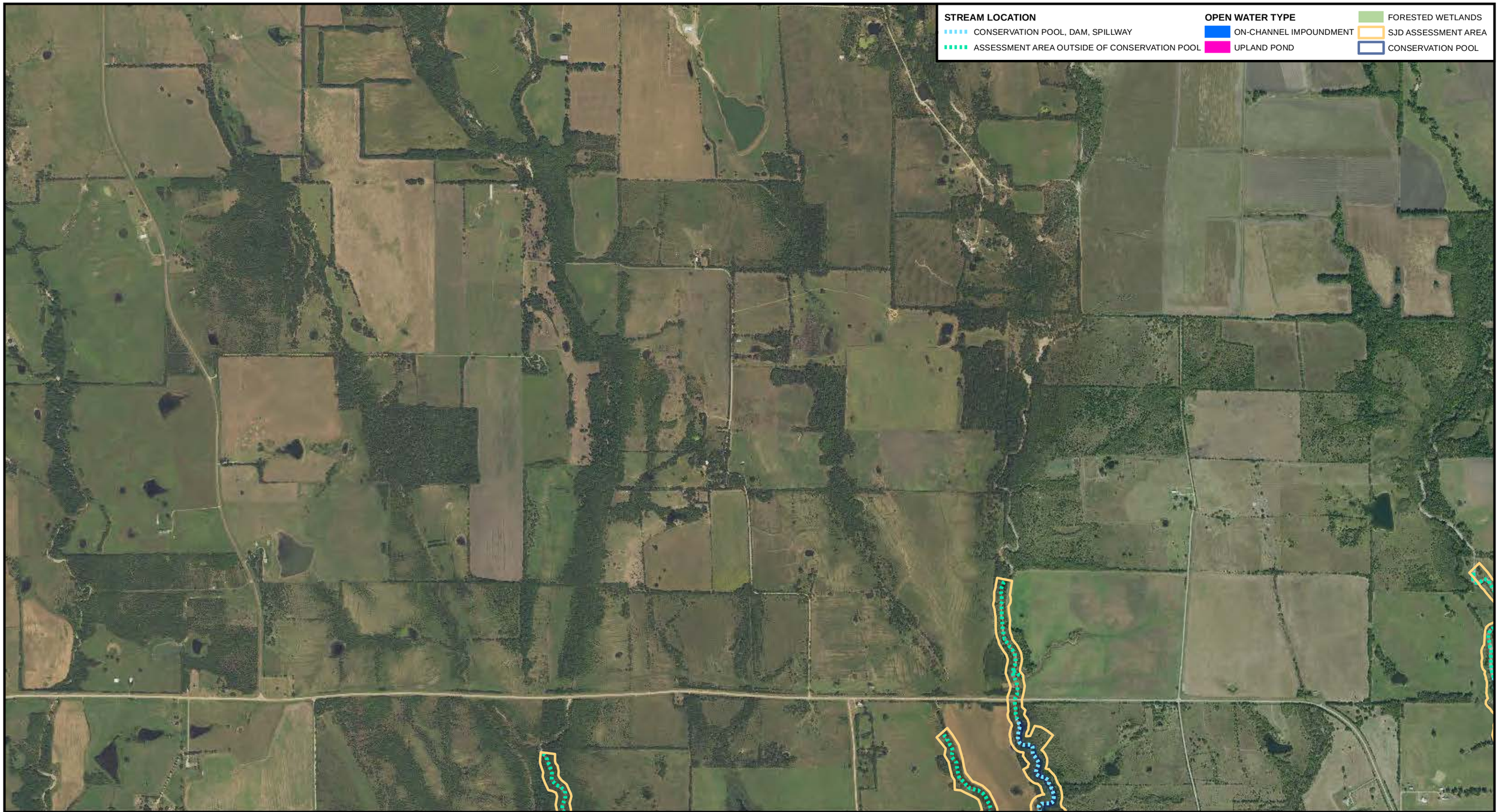
USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet



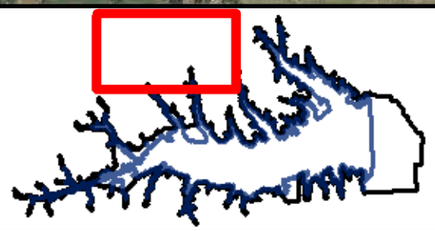


FIGURE 9: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

STREAM LOCATION
- CONSERVATION POOL, DAM, SPILLWAY
- ASSESSMENT AREA OUTSIDE OF CONSERVATION POOL

OPEN WATER TYPE
- ON-CHANNEL IMPOUNDMENT
- UPLAND POND

- FORESTED WETLANDS
- SJD ASSESSMENT AREA
- CONSERVATION POOL

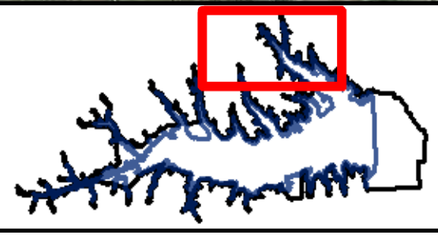


FIGURE 10: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

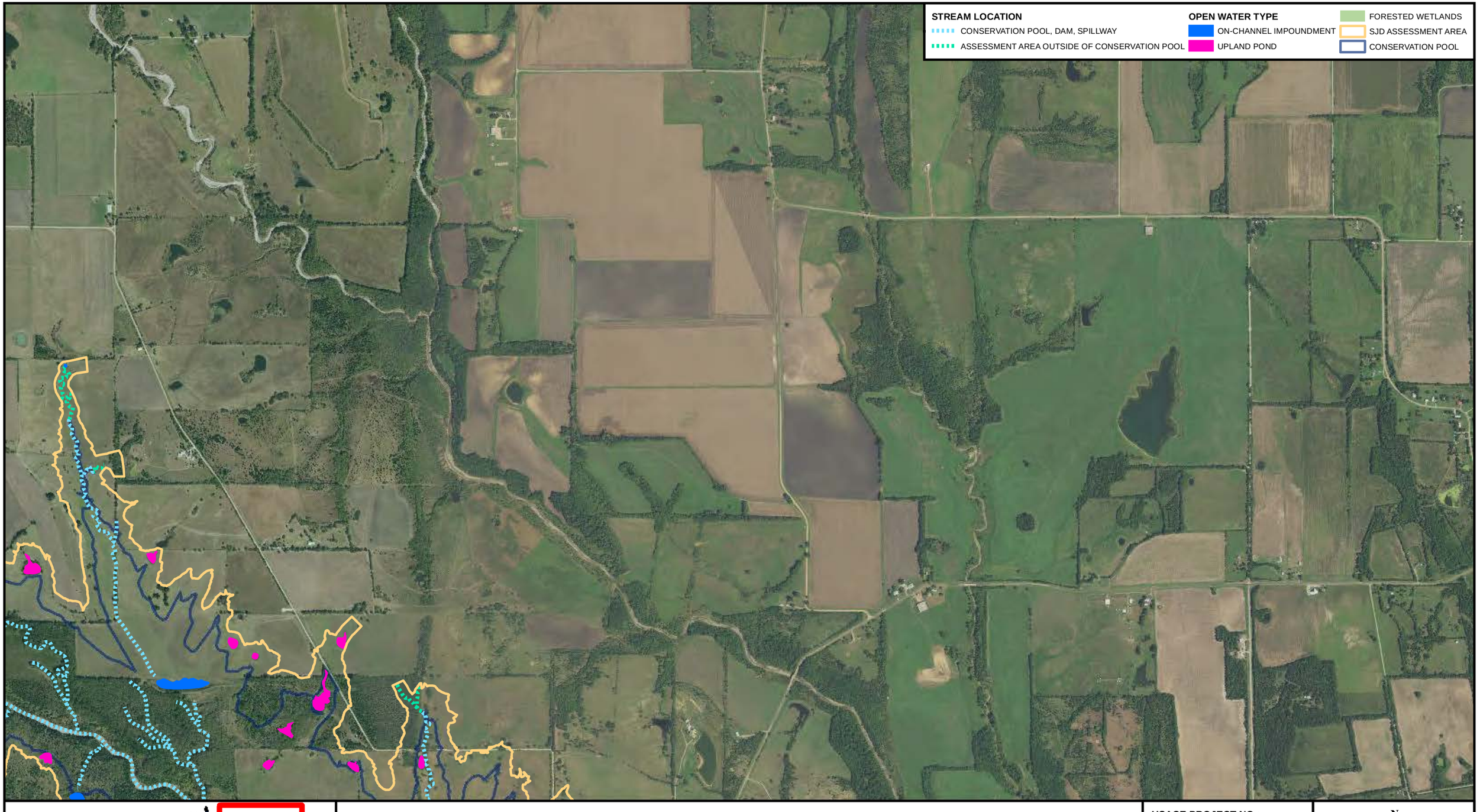
USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet



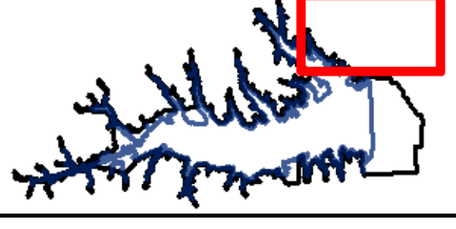


FIGURE 11: AQUATIC RESOURCES
PROPOSED LAKE RALPH HALL
SUPPLEMENTAL JURISDICTIONAL DETERMINATION

USACE PROJECT NO.:
SWF-2003-00336

PREPARED BY:
ALAN PLUMMER ASSOC., INC.

Date: 6/15/2017

N
W E
S

1,300 650 0 Feet

MAPBOOK

DELINEATED STREAMS