PROJECT MANUAL
VOLUME 6 OF 6

Stormwater Pollution Prevention Plan (SWPPP)

The City of Austin

Austin, Texas

MONTOPOLIS WATER RECLAMATION INITIATIVE (WRI) STORAGE RESERVOIR AND PUMP STATION PROJECT

CIP ID Number: 5267.035
IFB 6100 CLMC601
First advertisement date: July 18, 2016

Austin Water

It is the policy of the City of Austin to involve certified Minority Owned Business Enterprises (MBEs) and Women Owned Business Enterprises (WBEs) in City contracting. MBE and WBE goals for this solicitation are contained in Volume 4, MBE/WBE Procurement Program Package.

Prepared by:

Joseph W. Jenkins, P.E.
CH2M HILL
TBPE Firm No. 3699
12301 Research Boulevard, Building 4, Suite 250
Austin, Texas 78759
Phone: (512) 249-3331

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STATE OF TEXAS
JOSEPH W. JENKINS
68717
REGISTERED
PROFESSIONAL ENGINEER

Joseph W. Jenkins
5-11-2016

DIVISION 1—GENERAL REQUIREMENTS (SECTION 01096)

STATE OF TEXAS
DALE P. MURPHY
90614
LICENSED
PROFESSIONAL ENGINEER

5/10/2016

SPECIAL PROVISIONS TO CITY STANDARD TECHNICAL SPECIFICATIONS (SECTIONS SP201S, SP401S)
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STATE OF TEXAS
CURTIS R. BASNETT
106916
LICENSED
PROFESSIONAL ENGINEER
5-11-16

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STATE OF TEXAS
BENJAMIN MATTHEW BETZOLD
121236
LICENSED
PROFESSIONAL ENGINEER
5-11-16

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STATE OF TEXAS
RACHEL A. H. MALDOMADO
117500
LICENSED
PROFESSIONAL ENGINEER

05/11/2016

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STATE OF TEXAS
LYNN C. BROWN
55248
LICENSED
PROFESSIONAL ENGINEER

05/11/2016

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DIVISION 8—OPENINGS
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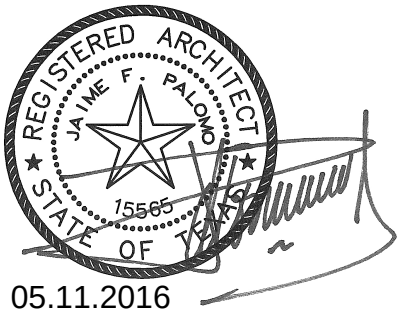

05.11.2016

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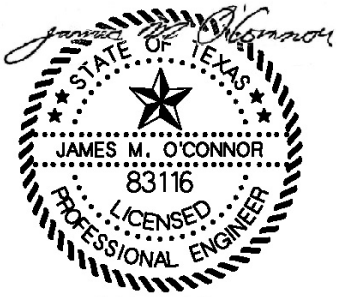

5/11/2016

CITY OF AUSTIN
AUSTIN WATER

BIDDING REQUIREMENTS
AND
CONTRACT DOCUMENTS

for the construction of the

MONTOPOLIS WATER RECLAMATION INITIATIVE (WRI) STORAGE RESERVOIR AND PUMP STATION PROJECT

C.I.P. ID No. 5267.035
IFB 6100 CLMC601
First Advertisement Date: July 18, 2016

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CH2M HILL
Austin, Texas
May 2016

Document Number		Title

VOLUME 1

INTRODUCTORY INFORMATION

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07/06/16		Table of Contents

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102S	08/20/07	Clearing and Grubbing
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S16730	05/23/11	Uninterruptible Power Supply
S16943	07/07/08	Temperature Transmitter RTD

Additional standard specifications not found in the list above and cross- referenced standard specifications not found in the list above may be obtained as follows:
{City of Austin Standard Specifications, Series 100 through 16000, adopted April 6, 1986, as amended. Available for purchase from

American Legal Publishing Corporation	*Telephone*	*1-800-445-5588*
Folio Business Partners and Publishers	*FAX*	*1-513-763-3562*
432 Walnut Street, 12th Floor	*email*	*amlegal@aol.com*
Cincinnati, Ohio 45202	*Web Page*	*http://www.amlegal.com*

Document Number		Title

VOLUME 3

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VOL. 5	08/01/15	**Geotechnical Report**
VOL. 6	09/03/15	**Stormwater Pollution Prevention Plan (SWPPP)**

END

CITY OF AUSTIN

MONTOPOLIS WATER RECLAMATION INITIATIVE

STORAGE RESERVOIR AND PUMP STATION

STORMWATER POLLUTION PREVENTION PLAN

PREPARED FOR

CITY OF AUSTIN

Austin WATER

PREPARED BY

K·FRIESE + ASSOCIATES

PUBLIC PROJECT ENGINEERING

SEPTEMBER 2015

Stormwater Pollution Prevention Plan
for:

Montopolis Water Reclamation Initiative Storage Reservoir and Pump Station
2707 Montopolis Drive
Austin, Texas 78741
COA Project #5267.035 IFB#CLMP036

Prepared for:

The City of Austin
Austin Water Utility
Waters Park Relief Main
Austin, Texas 78704

SWPPP Contact(s):

City of Austin – Project Manager
Imane Mrini, P.E.
Project Management Division
505 Barton Springs, Suite 900
Austin, Texas 78704
512-974-7060

SWPPP Preparation Date:

9/3/2015

Estimated Project Dates:

Project Start Date: 5 / 26 / 2016
Project Completion Date: 6 / 30 / 2017

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SECTION 1: SITE EVALUATION, ASSESSMENT, AND PLANNING

1.1 Project/Site Information

Project/Site Name: Montopolis Water Reclamation Initiative Storage Reservoir and Pump Station

Project Location: 2707 Montopolis Drive

City: Austin State: TX ZIP Code: 78741

County or Similar Subdivision: Travis

Latitude/Longitude (Use **one** of three possible formats, and specify method)

Latitude:	Longitude:
1. 30 º 12 ' 56.24 " N (degrees, minutes, seconds)	1. 97 º 42 ' 22.79 " W (degrees, minutes, seconds)
2. _ _ º _ _ . _ _' N (degrees, minutes, decimal)	2. _ _ º _ _ . _ _' W (degrees, minutes, decimal)
3. _ _ . _ _ _ _ º N (decimal)	3. _ _ . _ _ _ _ º W (decimal)

Method for determining latitude/longitude:

☐ USGS topographic map (specify scale: _____) ☐ EPA Web site ☐ GPS

☒ Other (please specify): Google Earth

Is the project located in Indian country? ☐ Yes ☒ No

If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable." Not Applicable

Is this project considered a federal facility? ☐ Yes ☒ No

NPDES project or permit tracking number*:_____

**(This is the unique identifying number assigned to your project by your permitting authority after you have applied for coverage under the appropriate National Pollutant Discharge Elimination System (NPDES) construction general permit.)*

1.2 Contact Information/Responsible Parties

Operator(s):

City of Austin
Project Management Division
Imane Mrini
505 Barton Springs Road, Suite 900
Austin, Texas 78704
512-974-7895

Project Manager(s) or Site Supervisor(s):

TO BE COMPLETED WHEN BID/AWARD COMPLETE
Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Insert area of control (if more than one operator at site) :

SWPPP Contact(s):

TO BE COMPLETED WHEN BID/AWARD COMPLETE
Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Insert area of control (if more than one operator at site) :

This SWPPP was Prepared by:

K Friese and Associates, Inc.
Dale Murphy, P.E.
1120 S Capital of Texas Hwy
CityView 2, Suite 100
Austin, TX 78746
t: (512) 338-1704
f: (512) 338-1784
Certification: P.E.

Emergency 24-Hour Contact:

TO BE COMPLETED WHEN BID/AWARD COMPLETE
Insert Company or Organization Name:
Insert Name:
Insert Telephone Number:

1.3 Nature and Sequence of Construction Activity

The project consists of the construction of an 18,880 square foot building to house a new 8.6 million gallon per day pump station, a new 4 million gallon ground storage tank, and associated piping as well as an access road with parking facilities, and stormwater water quality and detention facilities on a 2.0 acre lot with an additional 2.4 acres of a larger lot to be used as staging and storage.

What is the function of the construction activity?

☐ Residential ☐ Commercial ☐ Industrial ☐ Road Construction ☐ Linear Utility

☒ Other (please specify): Storage Reservoir and Pump Station

Estimated Project Start Date: 5 / 26 / 2016

Estimated Project Completion Date: 6 / 30 / 2017

1.4 Soils, Slopes, Vegetation, and Current Drainage Patterns

Soil type(s):

The following information was provided by CH2M Hill in the Geotechnical Investigation for the Proposed Montopolis Pump Station Facilities. The testing shows the proposed project site to be underlain by 4 to 8 feet of very stiff sandy lean clay to lean clay and very stiff to hard fat clay, which overlays hard fat clay and clayshale to the maximum depth of the borings (40 feet).

Slopes:

The project area consists of undeveloped land with extensive wooded growth. The majority of the project is relatively flat, with slopes ranging from 0 percent to 15 percent. A small portion of the project area contains slopes exceeding 15 percent.

Drainage Patterns:

Currently, stormwater flows overland follow existing contours to the south east to an existing drainage channel. The channel continues to the southeast, crossing State Highway 71 and entering Carson Creek. All impervious cover proposed on the site will be conveyed to the proposed detention facility located at the southeast corner of the property. This pond will discharge to the existing channel and the in existing drainage pattern will be maintained.

Vegetation:

Vegetation within the project area consists of a mixture of indigenous and invasive shrubs and trees. This includes Live Oak and Cedar as well as Cottonwood, Elm, Hackberry, and Spanish Oak.

1.5 Construction Site Estimates

The following are estimates of the construction site area:

Total project area:	4.41 acres
Construction site area to be disturbed:	4.41 acres
Limits of Construction	4.41 acres
Percentage impervious area before construction:	0.00%
Runoff coefficient before construction:	0.31
Percentage impervious area after construction:	15.6%
Runoff coefficient after construction:	0.41
Cut/Fill Volumes per Phase:	1,025 CY/760 CY

1.6 Receiving Waters

Description of receiving waters:

Carson Creek, received by the Colorado River, is located to the south east of the project site and collects stormwater runoff from the project site.

Description of storm sewer systems:

There are no existing storm sewer systems in the vicinity of the project. A proposed grate inlet and trench drain will be installed on the northeast corner of the pump station. The contributing basin is approximately 5,000 square feet and will not exceed the ponding requirements of the grate inlet or trench drain. The proposed storm sewer will be 12-inch diameter PVC.

Description of impaired waters or waters subject to TMDLs:

The project runoff will be discharged to Carson Creek. Per TCEQ 2012 Texas Integrated Report – Texas 303(d) List, the creek is listed as a Category 3 and is not considered an impaired waterway (Assessment Unit ID # 1428H).

1.7 Site Features and Sensitive Areas to be Protected

Several trees within the project area meet the definition for classification as heritage trees, as per Subchapter B, Article 1, Division 1, §25-8-602 of the Land Development Code. None of the heritage trees shall be removed. Several trees fall under the classification of protected and will need to be removed or otherwise impacted during project construction and possibly mitigated. A separate permit will be submitted to the City of Austin detailing the impacted trees and proposed mitigation practices.

An Environmental Constraints Evaluation was conducted by Hicks & Company for the Montopolis Water Reclamation Initiative Tank project. This evaulation did not identify any critical environmental features of significance in the project area.

Description of unique features that are to be preserved:

Project shall be constructed per the project grading plan. General topography will be maintained.

Describe measures to protect these features:

Approved sedimentation control practices will be implemented accordingly.

1.8 Potential Sources of Pollution

Potential sources of sediment to stormwater runoff:

- Spoils from trench excavation and imported backfill material
- Soils adhering to construction equipment tires and tracks
- Temporary staging and material storage area

Potential pollutants and sources, other than sediment, to stormwater runoff:

Trash, packaging material, debris, loose supplies, concrete/ grout mix, batteries, cleaning solvent, paint, diesel, gasoline, motor oil, liquid asphalt emulsion, chlorine, asphalt, hydraulic fluid, brake fluid and other incidental matter.

1.9 Endangered Species Certification

Are endangered or threatened species and critical habitats on or near the project area?

☐ Yes ☒ No

Describe how this determination was made:

The Environmental Constraints Evaluation conducted by Hicks & Company concluded there is no habitat present for the threatened or endangered species known in the vicinity of the project area. The assessment determined no adverse impacts to any endangered species or their habitats are expected to result from construction activities for the proposed project. Refer to the Environmental Constraints Evaluation dated July 8, 2013 attached in Appendix I for more information.

1.10 Historic Preservation

Are there any historic sites on or near the construction site?

☒ Yes ☐ No

Describe how this determination was made:

Hicks & Company performed and assessment of the cultural resources for the project. Pedestrian survey and shovel testing of the proposed project site revealed a single prehistoric archeological site of unknown temporal period with no features, and small amounts of observable materials. This site was recorded as 41TV2438. Due to a lack of chronological or cultural diagnostics, the lack of datable components that would add valuable data to the archaeological record, and a small assemblage size that is very typical of the area the site is recommended as ineligible for listing as a SAL. Based on the results of the current survey, it is recommended that no SALs will be affected by the proposed project. Refer to the Report on the Archeological Investigations attached in Appendix J for more information.

If yes, describe or refer to documentation that determines the likelihood of an impact on this historic site and the steps taken to address that impact.

Not Applicable

1.11 Maps

See Appendix A for Location Map

SECTION 2: EROSION AND SEDIMENT CONTROL BMPS

2.1 Minimize Disturbed Area and Protect Natural Features and Soil

Disturbed areas will be minimized with the use of E/S control methods as identified and presented in the E/S sheets attached in Appendix B. Curb inlet protection is proposed to be installed to capture sediment run-off. The construction activity will proceed in a linear fashion. Sediment control will be achieved by triangular filter dikes or silt fence along the excavated area and filter curb inlet protection for inlets within the project area. Storm water runoff during construction is not anticipated to be concentrated; instead it will be sheet flow as existing. The location of each BMP is shown in the Soil and Erosion Control Plans, located in Appendix B.

BMP Description: Silt Fence (COA Spec 642S. Standard Detail 642S-1)	
Installation Schedule:	Prior to any construction activities
Maintenance and Inspection:	Inspection shall be made weekly or after each rainfall event. Repair, replacement or adjustment shall be made promptly as needed.
Responsible Staff:	Contractor

***BMP Description*:** Tree Protection Fence (COA Spec 610S. Standard Detail 610S-1, 610S-4)	
***Installation Schedule*:**	Prior to any site preparation work
***Maintenance and Inspection*:**	To be maintained periodically or as needed throughout the duration of the project
***Responsible Staff*:**	Contractor

2.2 Phase Construction Activity

- Scheduled 5/26/16 – 6/30/17
- No long-term spoil stockpile is permitted. All excavation is anticipated to occur in area not requiring temporary stabilization. No work in creek or stream bank is proposed.
- The permanent stabilization of the disturbed area will commence upon the completion of the facilities and passing the quality control tests.
- Best management practices (BMP) have been shown on erosion, sedimentation control and tree protection (ESC) sheets. BMPs are also presented in Sections 3 and 4 of this SWPPP.
- Cut/fill is anticipated for the construction of the stormwater detention and water quality facilities.

2.3 Control Stormwater Flowing onto and through the Project

The sediment run-off from the project site will be minimized by the use of a silt fence and rock berm.

BMP Description: Silt Fence (COA Spec 642S. Standard Detail 642S-1)	
Installation Schedule:	Prior to any construction activities
Maintenance and Inspection:	Inspection shall be made weekly or after each rainfall event. Repair, replacement or adjustment shall be made promptly as needed.
Responsible Staff:	Contractor

***BMP Description*:** Rock Berm (COA Spec 639S. Standard Detail 639S-1)	
***Installation Schedule*:**	Prior to any construction activities
***Maintenance and Inspection*:**	Inspection shall be made weekly or after each rainfall event. Repair, replacement or adjustment shall be made promptly as needed.
***Responsible Staff*:**	Contractor

2.4 Stabilize Soils

Clean up and restoration work shall occur at the completion of the project. The contractor is required to restore all disturbed areas. Soil will be temporarily stabilized by watering for dust control as needed. The following BMP's will be applied to control dust/ mud.

BMP Description: Tracking Removal (Sweeping Construction Area)	
☐ ***Permanent***	☒ ***Temporary***
Installation Schedule:	At least twice a day and as often as needed
Maintenance and Inspection:	Periodic maintenance and inspection as needed
Responsible Staff:	Contractor

BMP Description: Watering for Dust Control	
☐ ***Permanent***	☒ ***Temporary***
Installation Schedule:	When visible dust emission is observed, use water hose to apply water on active construction area.
Maintenance and Inspection:	
Responsible Staff:	Contractor

BMP Description: Re-vegetation (COA Spec 604S)	
☒ ***Permanent***	☐ ***Temporary***
Installation Schedule:	Within 14 days upon completion of construction activities
Maintenance and Inspection:	Watering shall follow procedures outlined in COA Spec 604S or as otherwise specified
Responsible Staff:	Contractor

2.5 Protect Slopes

Revegetation with straw mulch will be used to protect existing slopes.

BMP Description: Non-Native Seeding (COA Spec 604S)	
Installation Schedule:	Within 14 days upon completion of construction activities
Maintenance and Inspection:	Watering shall follow procedures outlined in COA Spec 604S or as otherwise specified
Responsible Staff:	Contractor

2.6 Protect Storm Drain Inlets

Filter Dike Curb Inlet Protection will be used to protect storm drain inlets.

BMP Description: Filter Dike Curb Inlet Protection (COA Spec 628S-2)	
Installation Schedule:	Prior to any site work/ immediately after environmental pre-construction meeting.
Maintenance and Inspection:	Monitor the performance during each rainfall event and immediately remove the inlet protection if the storm water begins to overtop the curb.
Responsible Staff:	Contractor

2.7 Establish Perimeter Controls and Sediment Barriers

Sediment will be retained on-site through the use of silt fence. The location of each BMP is shown on the E/S sheet.

BMP Description: Silt Fence (COA Spec 642S. Standard Detail 642S-1)	
Installation Schedule:	***Installation Schedule***:
Maintenance and Inspection:	***Maintenance and Inspection***:
Responsible Staff:	***Responsible Staff***:

2.8 Retain Sediment On-Site

BMP Description: Silt Fence (COA Spec 642S. Standard Detail 642S-1)	
Installation Schedule:	Prior to any trench excavation
Maintenance and Inspection:	Inspection shall be made weekly or after each rainfall event, repair or replace promptly as needed.
Responsible Staff:	Contractor

BMP Description: Stabilized Construction Entrance (COA Spec 641S. Standard Detail 641S-1)	
Installation Schedule:	Prior to any construction activities
Maintenance and Inspection:	Maintained to prevent tracking of sediment onto public roadway
Responsible Staff:	Contractor

BMP Description: Rock Berm (COA Spec 639S. Standard Detail 639S-1)	
Installation Schedule:	Prior to any construction activity
Maintenance and Inspection:	Inspection shall be made weekly or after each rainfall event. Repair, replacement or adjustment shall be made promptly as needed.
Responsible Staff:	Contractor

2.9 Establish Stabilized Construction Exits

BMP Description: Stabilized Construction Entrance (COA Spec 641S. Standard Detail 641S-1)	
Installation Schedule:	Prior to construction activities
Maintenance and Inspection:	Maintained to prevent tracking of sediment onto public roadway
Responsible Staff:	Contractor

BMP Description: Tracking Removal (Sweeping Construction Area)	
Installation Schedule:	At least twice a day and as often as needed
Maintenance and Inspection:	Periodic maintenance and inspection, but not less than once a month
Responsible Staff:	Contractor

2.10 Additional BMPs

Not applicable.

SECTION 3: GOOD HOUSEKEEPING BMPS

3.1 Material Handling and Waste Management

All non-hazardous municipal waste materials such as litter, rubbish, trash, and garbage located on or originating on the project shall be collected in a securely lidded metal dumpster or trash cans, provided by the contractor. The dumpster or metal trash cans shall be emptied as necessary or as required by regulations and the trash hauled to a permitted disposal facility. The burying of non-hazardous municipal wastes on the project site shall not be permitted.

Description:

Building materials and other construction site wastes must be properly managed and disposed of to reduce the risk of pollution from materials such as surplus or refuse building materials or hazardous waste. Practices such as trash disposal, recycling, proper material handling, and spill prevention and cleanup measures can reduce the potential for stormwater runoff to mobilize construction site wastes and contaminate surface or ground water.

Applicability:

The proper management and disposal of wastes should be practiced at every construction site to reduce storm water runoff. Use waste management practices to properly locate refuse piles, to cover materials that might be displaced by rainfall or storm water runoff, and to prevent spills and leaks from hazardous materials that were improperly stored.

Siting and Design Considerations:

Solid Wastes:

- Designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterbody.
- Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible.
- Schedule waste collection to prevent the containers from overfilling.
- Clean up spills immediately. For hazardous materials, follow cleanup instructions on the package. Use an absorbent material such as sawdust or kitty litter to contain the spill.
- During the demolition phase of construction, provide extra containers and schedule more frequent pickups.
- Collect, remove, and dispose of all construction site wastes at authorized disposal areas. Contact a local environmental agency to identify these disposal sites.

Hazardous Materials and Wastes:

- Consult with local waste management authorities about the requirements for disposing of hazardous materials.
- Limit inventory to only enough product that is expected to be required for the job.
- To prevent leaks, empty and clean hazardous waste containers before disposing of them.

- Never remove the original product label from the container because it contains important safety information. Follow the manufacturer's recommended method of disposal, which should be printed on the label.
- Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.

To ensure the proper disposal of contaminated soils that have been exposed to and still contain hazardous substances, consult with state or local solid waste regulatory agencies or private firms. Some landfills might accept contaminated soils, but they require laboratory tests first.

Paint and dirt are often removed from surfaces by sandblasting. Sandblasting grits are the byproducts of this procedure and consist of the sand used and the paint and dirty particles that are removed from the surface. These materials are considered hazardous if they are removed from older structures because they are most likely to contain lead, cadmium, or chrome-based paints. To ensure proper disposal of sandblasting grits, contract with a licensed waste management or transport and disposal firm.

Only apply liquid emulsion "prime" coat for flexible base or for HMAC paving operations when weather forecast has no chance of precipitation for 24 hours.

Detergents:

Phosphorous and nitrogen containing detergents are used in wash water for cleaning purposes. Excess of these nutrients can be a major source of water pollution. Use detergents only as recommended, and limit their use on the site. Do not dump wash water containing detergents into the storm drain system; direct it to a sanitary sewer or contain it so that it can be treated at a wastewater treatment plant.

Limitations:

An effective waste management system requires training and signage to promote awareness of the hazards of improper storage, handling, and disposal of wastes. An effective way to be sure that waste management practices are being followed is to familiarize with worker habits and to inspect storage areas regularly. Extra management time may be required to ensure that all workers are following the proper procedures.

BMP Description: Trash Dumpster	
Installation Schedule:	Prior to commence of construction activities
Maintenance and Inspection:	Proper disposal when dumpster reaches its holding capacity. Periodic inspection to observe any leakage.
Responsible Staff:	Contractor

BMP Description: Portable Toilet	
Installation Schedule:	Prior to commence of construction activities
Maintenance and Inspection:	Weekly inspection and secure contract for waste disposal services
Responsible Staff:	Contractor

3.2 Establish Proper Building Material Staging Areas

Construction materials expected to be stored on-site: E&S materials, asphalt, flexible fence, tack coat, construction, pipe, debris, and portable toilet. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least one toilet shall be furnished for each 20 employees.

BMP Description: Document Material Stored On-Site Log	
Installation Schedule:	Prior to material delivery to job site
Maintenance and Inspection:	Continuous update for material storage inventory and perform weekly review by site superintendent
Responsible Staff:	Contractor

3.3 Designate Washout Areas

General Permit TXR150000 authorizes the wash-out of concrete trucks at this construction site as long as permit requirements are met. Discharge authorization is limited to the land disposal of wash-out water from concrete trucks.

In accordance with the General Permit, the following requirements will be met:

- Direct discharge of concrete truck wash-out to a creek, surface water, or a storm sewer is prohibited.
- If a wash-out at the construction site is used, it will have a minimal slope in order to contain the wash-out water, allow infiltration and filtering, and prevent discharge to a creek, surface water, or storm sewer.
- If a structural control is used, it may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the construction site.
- Wash-out of concrete trucks during rainfall events shall be minimalized. The direct discharge of concrete truck wash-out water is prohibited at all times. The operator shall ensure that its BMPs are sufficient to prevent the discharge of concrete truck wash-out as the result of rainfall.
- The discharge of wash-out water shall not cause or contribute to groundwater contamination.
- There will be no batch concrete plant on-site.

Concrete wash-out shall only occur at the Temporary Staging and Material Storage Area.

3.4 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

No on-site fuel storage facility is permitted. Vehicle and equipment re-fueling shall be performed off-site as much as practical. On-site equipment and vehicle maintenance shall be kept to a minimum. Maintenance personnel shall be informed of the location and proper usage of spill control kit and disposal of it after use.

Applicability:

Vehicle maintenance BMP's prevent construction site spills of grease, oil, fuel, or coolant from contaminating surface or ground water. They apply to all construction sites. Appropriate BMPs include the following:

- Developing a spill prevention and cleanup plan
- Preventing hazardous chemical leaks by properly maintaining vehicles and equipment
- Properly covering and providing secondary containment for fuel drums and toxic materials
- Properly handling and disposing of vehicle wastes

Implementation:

Inspect construction vehicles daily, and repair any leaks immediately. Dispose of all used oil, antifreeze, solvents and other automotive-related chemicals according to manufacturer instructions. These Wastes require special handling and disposal. Used oil, antifreeze, and some solvents can be recycled at designated facilities, but other chemicals must be disposed of at a hazardous waste disposal site. Local government agencies can help identify such facilities.

Maintenance Considerations:

Vehicle maintenance operations can produce substantial amounts of hazardous and other wastes that require regular disposal. Clean up spills and dispose of cleanup materials immediately. Inspect equipment and storage containers regularly to identify leaks or signs of deterioration.

Effectiveness:

These techniques effectively reduce discharges of untreated wastes to receiving waters. Their effectiveness highly depends on personnel's training and level of commitment to follow procedures.

BMP Description: Spill Control Kit	
Installation Schedule:	Spill control kit shall be available on-site at designated location prior to any construction activities
Maintenance and Inspection:	Weekly inspection by site safety personnel to ensure adequate supply and quantity for project use
Responsible Staff:	Contractor

3.5 Control Equipment/Vehicle Washing

Equipment and vehicle washing on-site will not be acceptable, unless it is specifically authorized by project inspector under special circumstances, such as washing to accommodate unscheduled service or repair work.

3.6 Spill Prevention and Control Plan

The Spill Prevention and Control Plan (SPCP) describes measures to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the proposed improvements. This plan identifies the potentially hazardous materials to be used; describes transport, storage, and disposal procedures for these substances; and outlines procedures to be followed in the event of a spill of contaminating or toxic substances. The prime contractor and each subcontractor are responsible for all supplied products/materials.

No on-site above ground or underground petroleum, fuel or chemical storage is permitted for this project.

Properly managing materials on the construction site will greatly reduce the potential for storm water pollution. Good housekeeping along with proper use and storage of construction materials form the basis for proper management of potentially hazardous material.

The proper use of materials and equipment along with the use of general common sense greatly reduces the potential for contaminating storm water runoff.

The following is a list of good housekeeping practices to assist in spill prevention control during the construction project:

- An effort shall be made to bring in only enough products to the project site required to complete the job task.
- Materials stored on the site shall be stored in a neat, orderly manner in appropriate containers and, if possible, under a roof or other enclosure.
- Products shall be kept in original containers with the original manufacturer’s label.
- Substances shall not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of the product shall be used before disposing of the container.
- Manufacturer’s recommendations for proper use and disposal of a product shall be followed.
- If surplus product must be disposed of, manufacturer’s or local and state recommended methods for proper disposal shall be followed.

Due to the chemical makeup of specific products, certain handling and storage procedures are required to promote the safety of handlers and prevent the possibility of pollution. Care shall be taken to follow all directions and warnings for products used on the site. All pertinent information can be found on the Material Safety Data Sheets (MSDS) for each product. A copy

of the MSDS shall be submitted to the construction superintendent.

On-site vehicles shall be monitored for leaks and receive regular maintenance to reduce the chance of leakage. No petroleum products shall be allowed to be stored at the project site.

Material staging area shall be enclosed with silt fence around the site. After each rainfall, the contractor shall inspect and re-install the silt fence to ensure its proper functioning and serve the intended purpose.

No waste oil or other petroleum based products shall be disposed of on-site (e.g. buried, poured, etc.). It shall be taken off-site for proper disposal.

In addition to the material management practices discussed previously, the following spill control and cleanup practices shall be followed to prevent storm water pollution in the event of a spill:

- Spills shall be contained and cleaned up immediately after discovery.
- Manufacturer methods for spill cleanup of a material shall be followed as described on the material's MSDS.
- Materials and equipment needed for cleanup procedures shall be kept readily available on the site, either at an equipment storage area or on the contractor's trucks. Equipment to be kept on site shall include but not be limited to brooms, dust pans, shovels, granular absorbents, sand, saw dust, absorbent pads and booms, plastic and metal trash containers, gloves, and goggles.
- Personnel on the site shall be made aware of cleanup procedures and the location of spill cleanup equipment.
- Toxic, hazardous or petroleum product spills required to be reported by regulation shall be documented to the appropriate federal, state, and local agencies.
- Spills shall be documented, recorded, and kept with this SWPPP.

If a spill occurs that requires reporting to the federal, state, or local agencies, the contractor is responsible for making the notifications.

For petroleum products, the federal reportable spill quantity is defined in 40 CFR 110 as any oil spill that:

- Violates applicable water quality standards,
- Causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or,
- Causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

The federal reportable spill quantities for hazardous materials are listed in 40 CFR, Part 302.4 in the table entitled "List of Hazardous Substances and Reportable Quantities." The reportable spill quantities for the State of Texas follows federal guidelines. Section 26.039 of the Texas Water

Code requires that accidental spills and releases be reported to the Texas Commission on Environmental Quality (TCEQ).

If a spill is reportable, the contractor's superintendent shall notify the follow authorities:

Federal: National Response Center – 800-424-8802
EPA Region 6 Emergency Response Center – 866-372-7745

State: State Emergency Response Commission
512-463-7727 (24-hour service)

Texas Commission on Environmental Quality
Park 35 Complex, Building A
12100 Park 35 Circle
Austin, TX 78753
800-453-8224 (24-hour service)
Region 11 – 512-339-29229 (8:00 Am to 5:00 PM)

If a reportable release occurs, a modification to the SWPPP must be made within 14 days. The modification shall include:

- Date of the release
- Description of the release
- Explanation of the reason the spill happened
- Description of response procedures if a second spill or release occurs within 14 days of the initial release

A written description of the release must be submitted to the regulatory authority that includes:

- Description of the release, including the date of the release, the type of material and the estimated amount of spill;
- Explanation of the reason the spill happened
- Description of the steps taken to prevent and control future releases

Any modifications to the SWPP shall be documented and incorporated into this SWPPP

The following are the material management practices that will be used to reduce the risk of spills or exposure of unwanted materials to storm water runoff:

- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the materials storage area onsite. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.

- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing for exposure to hazardous substances.
- Spills of toxic or hazardous material will be reported to the appropriate state or local government agency, regardless of the size.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
- The contractor superintendent, responsible for the day-to-day site operations, will be the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the office trailer outside.

3.7 Any Additional BMPs

Additional BMPs will be incorporated into the project when new storm water pollution prevention measures are introduced.

3.8 Allowable Non-Stormwater Discharge Management

The following non-stormwater discharges are allowed for this project:

- Discharges from firefighting activities (firefighting activities do not include washing of trucks, run-off water from training activities, and test water from fire suppression systems)
- Water used to control dust
- Potable water including uncontaminated water line flushing (excluding discharges of hyper-chlorinated water, unless the water is first de-chlorinated and discharges are not expected to adversely affect aquatic life)
- Landscape irrigation
- Discharges from trench dewatering activities which include sediment removal processes.

SECTION 4: SELECTING POST-CONSTRUCTION BMPs

This project proposes to construct an access road, ground storage tank, pump station as well as stormwater detention and water quality facilities. Upon the completion of the work, the seeding will be used to restore vegetative areas being disturbed by construction activities. Impervious areas, such as asphalt pavement, disturbed during construction will be restored to its original condition.

SECTION 5: INSPECTIONS

5.1 Inspections

1. ***Inspection Personnel:*** Identify the person(s) who will be responsible for conducting inspections and describe their qualifications:

Contractor shall identify and list persons who will be responsible for conducting inspections and describe their qualifications, training received and other relevant supporting documents.

City of Austin Project Inspector:
TO BE COMPLETED WHEN BID/AWARD COMPLETE

City of Austin Environmental Inspector:
TO BE COMPLETED WHEN BID/AWARD COMPLETE

2. ***Inspection Schedule and Procedures:***

Inspection of Controls:

In the event of flooding or other uncontrollable situations that prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable.

Personnel provided by the permittee and familiar with the SWPPP must inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Personnel conducting these inspections must be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWPPP for the site. Sediment and erosion control measures identified in the SWPPP must be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking. Inspections must be conducted at least once every (14) calendar days and within twenty four (24) hours of the end of a storm event of 0.5 inches or greater.

Where sites have been finally or temporarily stabilized, inspections must be conducted at least once every month.

As an alternative to the above described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWPPP may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, then the inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event since the previous inspection. The inspections may occur on either schedule provided that the SWPPP reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provision: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWPPP (e.g., end of “dry” season and beginning of “wet” season).

The SWPPP must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWPPP must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified, or if additional BMPs are necessary, an implementation schedule must be described in the SWPPP and wherever possible those changes implemented before the next storm event. If implementation before the anticipated storm event is impracticable, these changes must be implemented as soon as practicable.

A report summarizing the scope of the inspection, the date(s) of the inspection and major observations relating to the implementation of the SWPPP must be made and retained as part of the SWPPP. Major observations should include: the locations of discharges of sediment or other pollutants from the site; locations of BMPs that need to be maintained, locations of BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed.

Actions taken as a result of inspections must be described within, and retained as part of, the SWPPP. Reports must identify any incidents of noncompliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWPPP and this permit. This report must be signed by the person and in the manner required by 30 TAC 305.128 (relating to Signatories to Reports).

General Procedures for Correcting Problems:

All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. Sediment accumulations at temporary control measures shall be removed when the depth reaches 6 inches and properly disposed. If through inspections the permittee determines that BMPs are not operating effectively, maintenance must be performed before the next anticipated storm event or as necessary to maintain effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, the reason shall be documented in the SWPPP and maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run-over, removed, or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

If periodic inspections or other information indicates a control has been used incorrectly, is performing inadequately, or is damaged, then the operator must replace or modify the control as soon as practicable after making the discovery.

If sediment escapes the site, accumulations must be removed at a frequency that minimizes off-site impacts, and prior to the next rain event, if feasible. If the permittee does not own or operate the off-site conveyance, then the permittee must work with the owner or operator of the property to remove the sediment.

Responsible staff for correcting problems:

TO BE COMPLETED WHEN BID/AWARD COMPLETE

5.2 Delegation of Authority

Duly Authorized Representative(s) or Position(s):
TO BE COMPLETED WHEN BID/AWARD COMPLETE

Insert Company or Organization Name:
Insert Name:
Insert Position:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:

Attach a copy of the signed delegation of authority form in Appendix H.

5.3 Corrective Action Log

See Appendix C for Corrective Action Log.

SECTION 6: RECORDKEEPING AND TRAINING

6.1 Recordkeeping

Records will be retained for a minimum period of at least 3 years after the permit is terminated.

Date(s) when major grading activities occur:
Refer to Appendix F – Grading and Stabilization Log

Date(s) when construction activities temporarily or permanently cease on a portion of the site:
Refer to Appendix F – Grading and Stabilization Log

Date(s) when an area is either temporarily or permanently stabilized:
Refer to Appendix F – Grading and Stabilization Log

6.2 Log of Changes to the SWPPP

See Appendix D for Log of Changes to SWPPP.

6.3 Training

Individual(s) Responsible for Training:
TO BE COMPLETED WHEN BID/AWARD COMPLETE

Describe Training Conducted:

- General stormwater and BMP awareness training for staff and subcontractors:

- Detailed training for staff and subcontractors with specific stormwater responsibilities:

SECTION 7: FINAL STABILIZATION

This project proposes to install wastewater lines in excavated trenches. Upon the completion of the work, the site will be restored to its pre-construction condition. Permanent stabilization will be completed by seeding or sodding with native and non-native grass until the grass uniformly reaches a height of 2 1/2 inches or final acceptance by the City.

BMP Description: Seeding for Erosion Control (COA Spec 604S)	
Installation Schedule:	Within 14 day upon the completion of construction activities
Maintenance and Inspection:	Watering shall follow procedures outlined in COA Spec 604S or as otherwise specified
Responsible Staff:	Contractor

SECTION 8: CERTIFICATION AND NOTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

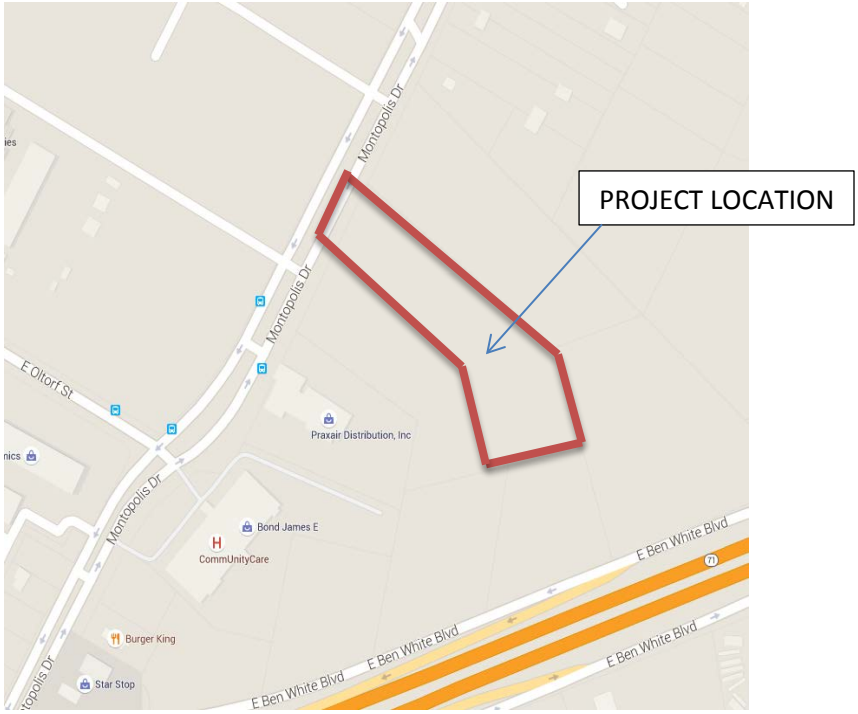
Signature: _____ Date: _____

Appendix A – General Location Map

City of Austin - Austin Water Utility

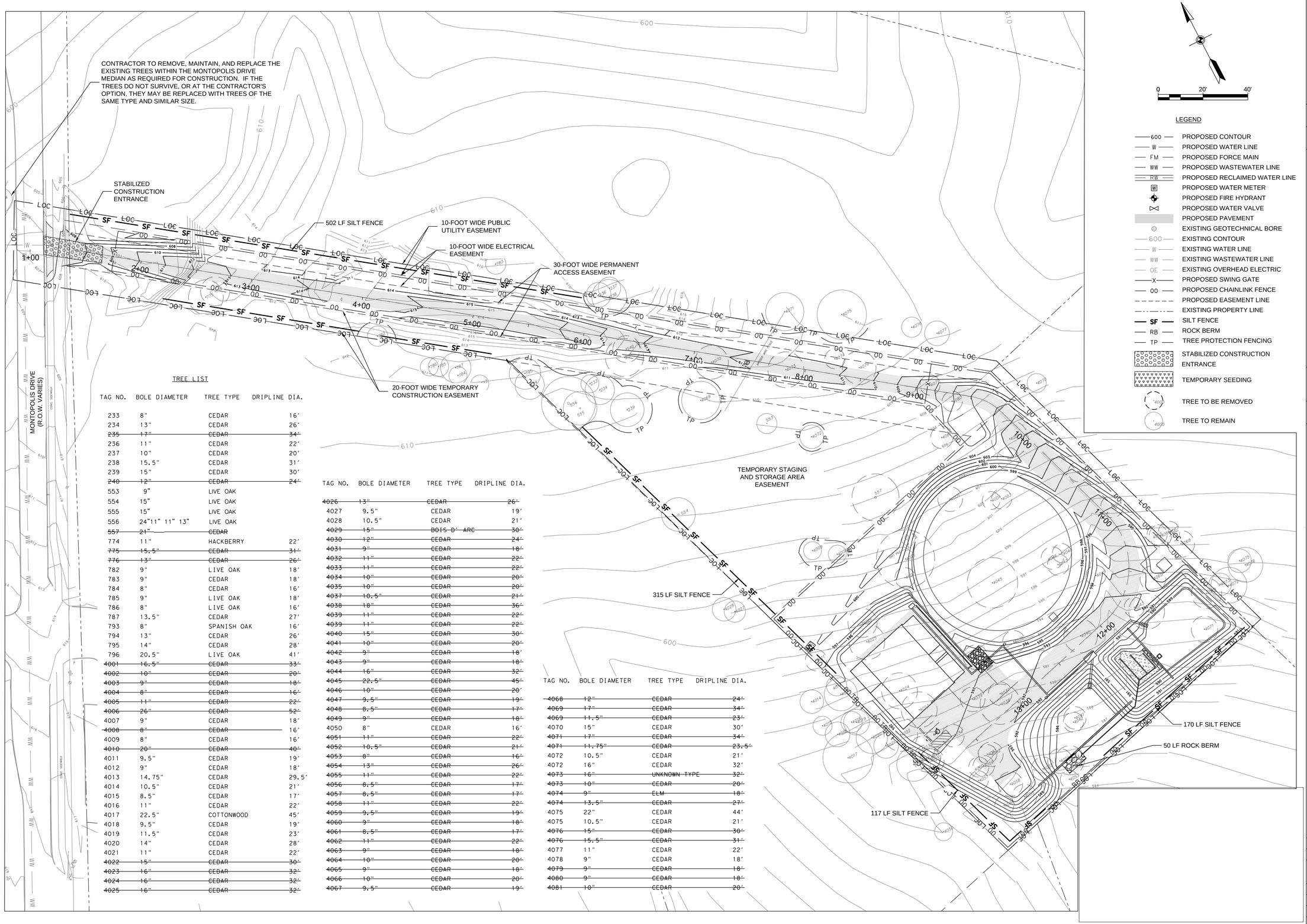
MONTOPOLIS WATER RECLAMATION INITIATIVE (WRI)

STORAGE RESERVOIR AND PUMP STATION



Site Location Map

Appendix B – Soil and Erosion Control Plans



LEGEND

600	PROPOSED CONTOUR
W	PROPOSED WATER LINE
FM	PROPOSED FORCE MAIN
WW	PROPOSED WASTEWATER LINE
RW	PROPOSED RECLAIMED WATER LINE
W	PROPOSED WATER METER
	PROPOSED FIRE HYDRANT
	PROPOSED WATER VALVE
	PROPOSED PAVEMENT
	EXISTING GEOTECHNICAL BORE
600	EXISTING CONTOUR
W	EXISTING WATER LINE
WW	EXISTING WASTEWATER LINE
OE	EXISTING OVERHEAD ELECTRIC
X	PROPOSED SWING GATE
OO	PROPOSED CHAINLINK FENCE
	PROPOSED EASEMENT LINE
	EXISTING PROPERTY LINE
SF	SILT FENCE
RB	ROCK BERM
TP	TREE PROTECTION FENCING
	STABILIZED CONSTRUCTION ENTRANCE
	TEMPORARY SEEDING
400	TREE TO BE REMOVED
4000	TREE TO REMAIN

TREE LIST

TAG NO.	BOLE DIAMETER	TREE TYPE	DRIPLINE DIA.
233	8"	CEDAR	16'
234	13"	CEDAR	26'
~~235~~	~~17"~~	~~CEDAR~~	~~34'~~
236	11"	CEDAR	22'
237	10"	CEDAR	20'
238	15.5"	CEDAR	31'
239	15"	CEDAR	30'
~~240~~	~~12"~~	~~CEDAR~~	~~24'~~
553	9"	LIVE OAK	
554	15"	LIVE OAK	
555	15"	LIVE OAK	
556	24"11" 11" 13"	LIVE OAK	
~~557~~	~~21"~~	~~CEDAR~~	
774	11"	HACKBERRY	22'
~~775~~	~~15.5"~~	~~CEDAR~~	~~31'~~
~~776~~	~~13"~~	~~CEDAR~~	~~26'~~
782	9"	LIVE OAK	18'
783	9"	CEDAR	18'
784	8"	CEDAR	16'
785	9"	LIVE OAK	18'
786	8"	LIVE OAK	16'
787	13.5"	CEDAR	27'
793	8"	SPANISH OAK	16'
794	13"	CEDAR	26'
795	14"	CEDAR	28'
796	20.5"	LIVE OAK	41'
~~4001~~	~~16.5"~~	~~CEDAR~~	~~33'~~
~~4002~~	~~10"~~	~~CEDAR~~	~~20'~~
~~4003~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4004~~	~~8"~~	~~CEDAR~~	~~16'~~
~~4005~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4006~~	~~26"~~	~~CEDAR~~	~~52'~~
4007	9"	CEDAR	18'
~~4008~~	~~8"~~	~~CEDAR~~	16'
4009	8"	CEDAR	16'
~~4010~~	~~20"~~	~~CEDAR~~	~~40'~~
4011	9.5"	CEDAR	19'
4012	9"	CEDAR	18'
4013	14.75"	CEDAR	29.5'
4014	10.5"	CEDAR	21'
4015	8.5"	CEDAR	17'
4016	11"	CEDAR	22'
4017	22.5"	COTTONWOOD	45'
4018	9.5"	CEDAR	19'
4019	11.5"	CEDAR	23'
4020	14"	CEDAR	28'
4021	11"	CEDAR	22'
~~4022~~	~~15"~~	~~CEDAR~~	~~30'~~
~~4023~~	~~16"~~	~~CEDAR~~	~~32'~~
~~4024~~	~~16"~~	~~CEDAR~~	~~32'~~
~~4025~~	~~16"~~	~~CEDAR~~	~~32'~~

TAG NO.	BOLE DIAMETER	TREE TYPE	DRIPLINE DIA.
~~4026~~	~~13"~~	~~CEDAR~~	~~26'~~
4027	9.5"	CEDAR	19'
4028	10.5"	CEDAR	21'
~~4029~~	~~15"~~	~~BOIS D' ARC~~	~~30'~~
~~4030~~	~~12"~~	~~CEDAR~~	~~24'~~
~~4031~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4032~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4033~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4034~~	~~10"~~	~~CEDAR~~	~~20'~~
~~4035~~	~~10"~~	~~CEDAR~~	~~20'~~
~~4037~~	~~10.5"~~	~~CEDAR~~	~~21'~~
~~4038~~	~~18"~~	~~CEDAR~~	~~36'~~
~~4039~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4039~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4040~~	~~15"~~	~~CEDAR~~	~~30'~~
~~4041~~	~~10"~~	~~CEDAR~~	~~20'~~
~~4042~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4043~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4044~~	~~16"~~	~~CEDAR~~	~~32'~~
~~4045~~	~~22.5"~~	~~CEDAR~~	~~45'~~
~~4046~~	~~10"~~	~~CEDAR~~	~~20'~~
~~4047~~	~~9.5"~~	~~CEDAR~~	~~19'~~
~~4048~~	~~8.5"~~	~~CEDAR~~	~~17'~~
~~4049~~	~~9"~~	~~CEDAR~~	~~18'~~
4050	8"	CEDAR	16'
~~4051~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4052~~	~~10.5"~~	~~CEDAR~~	~~21'~~
~~4053~~	~~8"~~	~~CEDAR~~	~~16'~~
~~4054~~	~~13"~~	~~CEDAR~~	~~26'~~
~~4055~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4056~~	~~8.5"~~	~~CEDAR~~	~~17'~~
~~4057~~	~~8.5"~~	~~CEDAR~~	~~17'~~
~~4058~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4059~~	~~9.5"~~	~~CEDAR~~	~~19'~~
~~4060~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4061~~	~~8.5"~~	~~CEDAR~~	~~17'~~
~~4062~~	~~11"~~	~~CEDAR~~	~~22'~~
~~4063~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4064~~	~~10"~~	~~CEDAR~~	~~20'~~
~~4065~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4066~~	~~10"~~	~~CEDAR~~	~~20'~~
~~4067~~	~~9.5"~~	~~CEDAR~~	~~19'~~

TAG NO.	BOLE DIAMETER	TREE TYPE	DRIPLINE DIA.
~~4068~~	~~12"~~	~~CEDAR~~	~~24'~~
~~4069~~	~~17"~~	~~CEDAR~~	~~34'~~
~~4069~~	~~11.5"~~	~~CEDAR~~	~~23'~~
4070	15"	CEDAR	30'
~~4071~~	~~17"~~	~~CEDAR~~	~~34'~~
~~4071~~	~~11.75"~~	~~CEDAR~~	~~23.5'~~
4072	10.5"	CEDAR	21'
4072	16"	CEDAR	32'
~~4073~~	~~16"~~	~~UNKNOWN TYPE~~	~~32'~~
~~4073~~	~~10"~~	~~CEDAR~~	~~20'~~
~~4074~~	~~9"~~	~~ELM~~	~~18'~~
~~4074~~	~~13.5"~~	~~CEDAR~~	~~27'~~
4075	22"	CEDAR	44'
4075	10.5"	CEDAR	21'
~~4076~~	~~15"~~	~~CEDAR~~	~~30'~~
~~4076~~	~~15.5"~~	~~CEDAR~~	~~31'~~
4077	11"	CEDAR	22'
4078	9"	CEDAR	18'
~~4079~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4080~~	~~9"~~	~~CEDAR~~	~~18'~~
~~4081~~	~~10"~~	~~CEDAR~~	~~20'~~

STATE OF TEXAS
DALE P. MURPHY
90614
LICENSED
PROFESSIONAL ENGINEER
08/28/2015

NO.	DATE	REVISION	BY	APVD
DSGN	DR	CHK	APVD	D Murphy
D Murphy	M Gilfillan	D Murphy	D Murphy	

K·FRIESE + ASSOCIATES
PUBLIC PROJECT ENGINEERING
TBPE Firm #3435

Montopolis Water Reclamation Initiave (WRI)
Storage Reservoir and Pump Station
Austin Water Utility
Austin, Texas

CH2MHILL®
TBPE FIRM NO. 3699

CIVIL

EROSION CONTROL AND TREE PROTECTION PLAN

1" = 40'
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2015
PROJ	472902
DWG	C-14
SHEET	of

Appendix C – Corrective Action Log

Project Name:
SWPPP Contact:

Inspection Date	Inspector Name(s)	Description of BMP Deficiency	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

Appendix D – SWPPP Amendment Log

Project Name:
SWPPP Contact:

Amendment No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Appendix E – Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

Appendix F – Grading and Stabilization Activities Log

Project Name:
SWPPP Contact:

Date Grading Activity Initiated	Description of Grading Activity	Date Grading Activity Ceased (Indicate Temporary or Permanent)	Date When Stabilization Measures are Initiated	Description of Stabilization Measure and Location

Appendix G – SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name:

Project Location:

Instructor's Name(s):

Instructor's Title(s):

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- ❑ Erosion Control BMPs
- ❑ Emergency Procedures
- ❑ Sediment Control BMPs
- ❑ Good Housekeeping BMPs
- ❑ Non-Stormwater BMPs

Specific Training Objective:_____

_____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Appendix H – Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in _____ (Reference State Permit), and that the designee above meets the definition of a "duly authorized representative" as set forth in _____ (Reference State Permit).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

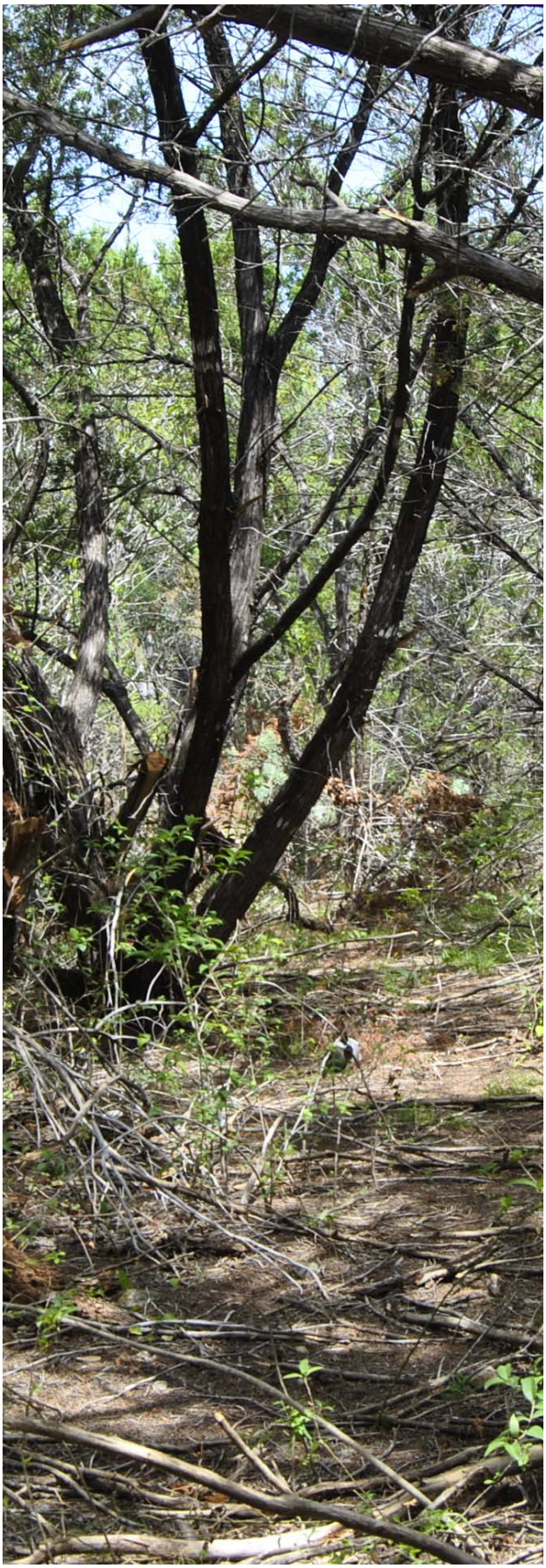
Company: _____

Title: _____

Signature: _____

Date: _____

Appendix I – Environmental Constraints Evaluation



TECHNICAL MEMORANDUM

Environmental Constraints Evaluation, City of Austin Montopolis Water Reuse Storage Project

Prepared by

Hicks & Company
1504 West 5th Street
Austin, Texas 78703

July 8, 2013

HICKS & COMPANY
ENVIRONMENTAL
ARCHEOLOGICAL
AND PLANNING
CONSULTANTS

HICKS & COMPANY
ENVIRONMENTAL ARCHEOLOGICAL AND PLANNING CONSULTANTS

1504 WEST 5TH STREET AUSTIN, TEXAS 78703 TEL: 512 / 478-0858 FAX 512 / 474-1849

TECHNICAL MEMORANDUM

TO: Joe Jenkins, P.E.
CH2M Hill

FROM: Roy Frye
Hicks & Company

DATE: July 8, 2013

RE: Environmental Constraints Evaluation, City of Austin Montopolis Water Reuse Storage Tank

1.0 Introduction

This Technical Memorandum documents the findings of an environmental constraints analysis conducted for a proposed water reuse storage tank site and associated water line near the intersection of Montopolis Drive and State Highway (SH) 71 in Austin, Travis County, Texas. The analysis was conducted to assist the engineering design consultant, CH2M Hill, in assessing the site for the presence of cultural resources, endangered species, and wetlands and to identify any associated environmental constraints or permitting issues. The project has been assigned under the City of Austin (COA) Water Utilities Rotation List.

The focus of the evaluation was to: 1) identify the occurrence of any waters of the U.S., including wetlands, potentially regulated by the U.S. Army Corps of Engineers (USACE) and any associated permitting requirements under Section 404 of the Clean Water Act; 2) determine the potential occurrence of federally and state-listed endangered species or their critical habitats; and 3) determine the potential for impacts to any archeological resources. This report contains a description of the existing conditions at the project site, including the presence of any critical environmental features as defined by the COA; results of an evaluation to delineate waters of the U.S., including wetlands, subject to regulation by the USACE; and results of endangered species and archeological resource investigations.

2.0 Project Description

The proposed project includes the construction of a water reuse storage tank and associated underground pipeline that would connect the storage tank to existing water reuse infrastructure (**Figure 1**). The site location for the storage tank is approximately 2.01 acres in size. The pipeline corridor includes a 30-foot water line access easement, 10-foot public utility easement, 10-foot electrical easement, and 20 foot temporary construction easement, all being used for the project and comprising a 70-foot corridor. The pipeline corridor to the tank site is approximately 850 feet long by 70 feet wide, or about 1.37 acres. The total footprint area for the project is

about 3.44 acres. The area is densely vegetated as described in **Section 3.3** below and portrayed by **Figures 2** and **3**.

3.0 Affected Environment

3.1 Topography

The site is located in southeastern Austin, Travis County, Texas, within the Austin East 7.5-minute quadrangle map published by the U.S. Geological Survey (USGS). Topography in the project area is gently sloping from northwest to southeast, with the exception of an incised swale near the western terminus of the pipeline corridor within 150 feet of Montopolis Drive. This swale begins as a gentle depression within the alignment corridor (**Figure 4**) that runs down slope approximately 80 feet, where it changes to an incised rocky outcrop that is about seven feet high (**Figure 5**). Surface elevations decline from about 620 feet mean sea level (msl) near the middle of the pipeline corridor on the northwestern side of the project area to about 584 feet msl on the southeastern side of the area (COA 2013a).

3.2 Geology

The project area lies within portions of two geological formations: the high terrace deposits (Qht) dating to the beginning of the early Pleistocene, and the Ozan formation (Ko) that was laid down during the Upper Cretaceous Epoch between 72 and 100 million years ago (BEG 1981, 2007) (**Figure 6**). High terrace deposits in the Austin area are fluviatile formations representing former levels of the Colorado River and its tributaries. Commonly, the matrix is composed of gravel, silts, sands, and clays. The Ozan Formation (locally named the Sprinkle Formation) is comprised of clay and marl with calcareous content decreasing upwards through the formation, which is about 600+ feet in thickness. Characteristic nodules of hematite and pyrite and silt-size quartz and calcite fragments are common and become more abundant upward, where shape is blocky and fractures conchoidal (BEG 1981).

3.3 Soils

According to the United States Department of Agriculture's (USDA's) Web Soil Survey for Travis County (USDA 2012), soils within the proposed project area consist of Heiden clay (HeD2), 5 to 8 percent slopes, moderately eroded; Patrick soils (PaC), 2 to 5 percent slopes; Lewisville silty clay (LcB), 1 to 2 percent slops; and Houston Black soils (HsD) and Urban Land, 0 to 8 percent slopes (**Figure 6**). Heiden clay is derived from clayey residuum weathered from Eagleford shale or Taylor marl. Both the Patrick and Lewisville series are parented from quaternary alluvium derived from mixed sources typically located on terrace landforms. Houston Black soils and Urban land consist of 56 percent Houston Black clay, 30 percent Urban Land, and about 14 percent other soils including but not limited to Heiden and Burleson clay. This unit is located on ridges and foot slopes and in urban areas.

<u>Anticipated Impacts:</u> Adverse impacts to soils and geology from the proposed project would be negligible. Operations would not cause discernible alteration to geologic layers or surficial or shallow geology. This level of alteration to soils and geology would not affect the geology or soils' long-term ability to sustain biota, water quality, or hydrology. No reclamation would be expected to be necessary.

3.4 Vegetation in the Study Area

The project site occurs within a transition area between the Edwards Plateau (west of Austin) and the Texas Blackland Prairies (east of Austin) as mapped by Griffith et al. (2004) and USEPA (2003). These vegetation regions were originally described by Gould et al. (1960) and Gould (1975) and have been mapped in more detail by TPWD (2011).

A field evaluation of existing vegetation was conducted within the project area by Hicks & Company ecologists in June 2013. The site was characterized as Ashe juniper (*Juniperus asheii*)-dominated woods with a vegetation height averaging about 18-25 feet with a canopy coverage ranging between 75 and 100 percent (**Figures 2** and **3**). Within this community, a number of woody and herbaceous species were observed (**Table 1**).

Table 1	Plants Observed During Field Reconnaissance	
Trees	**Shrubs/Vines/Succulents**	**Grasses/Forbs/Herbaceous**
Ashe juniper (*Juniperus asheii*)	Dewberry (*Rubus aboriginum*)	King Ranch bluestem (*Bothriochloa ischaemum*)
Live oak (*Quercus virginiana*)	Grape (*Vitis sp.*)	Texas grama (*Bouteloua regidiseta*)
Brazil (*Condalia hookeri*)	Poison ivy (*Toxicodendron radicans*)	Coreopsis (*Coreopsis tinctoria*)
Bumelia (*Bumelia lanuginosa*)	Greenbriar (*Smilax bona-nox*)	Prairie verbena (*Glandularia bipinnatifida*)
Mesquite (*Prosopis glandulosa*)	Prickly Pear (*Opuntia lindheimeri*)	Cedar sedge (*Carex planostachys*)
Ligustrum (*Ligustrum sinense*)	Skunkbush sumac (*Rhus aromatica*)	
Chinaberry (*Melia azedarach*)	Evergreen sumac (*Rhus virens*)	
Cedar elm (*Ulmus crassifolia*)	Elbowbush (*Forestiera pubescens*)	
Soapberry (*Sapindus saponaria*)	Yaupon (*Ilex vomitoria*)	
	Nandina (*Nandina domestica*)	
	Lantana (*Lantana horrida*)	

The overall habitat quality and diversity of the vegetation within the project area has been substantially influenced by a highly disturbed suburban landscape. Many areas within the site have been invaded by ligustrum and chinaberry and are being disturbed by trails, brush clearing for camping areas, and illegal trash disposal.

Tree Preservation

A tree survey performed for the project indicated eight species occurring with trunk (bole) sizes eight inches or greater: Ashe juniper, hackberry (*Celtis laevigata*), live oak, (*Quercus Virginiana*) Texas oak (*Quercus buckleyi*), cottonwood (*Populus deltoides*), Osage orange (*Maclura pomifera*), cedar elm (*Ulmus grassifolia*), and an unknown species. According to the COA Ordinance 20100204-038, a "protected tree" is one with a diameter of 19 inches or more measured 4.5 feet above natural grade. A “Heritage Tree” includes any of the following trees with a diameter of 24 inches or more measured 4.5 feet above natural grade: all oaks, Texas ash, bald cypress, American elm, cedar elm, Texas madrone, bigtooth maple, pecan, Arizona walnut, and eastern black walnut. Construction-related activities that result in impacts to such trees are generally prohibited without a permit issued by the COA Planning and Development Review Department.

Removal of trees may require mitigation, as stated in the COA Land Development Code (LDC) §25-8-604(B) and (C): “If development under a proposed site plan will remove a tree eight inches or larger in diameter, the City may require mitigation, including the planting of replacement trees, as a condition of site plan approval and may not release the site plan until mitigation requirements are satisfied. Waivers, variances, and modifications may apply under certain conditions.”

Anticipated Impacts: A total of 110 trees with trunk sizes 8'' or greater were located within the vicinity of the project. Of this number, six trees were categorized as "protected trees": four Ashe junipers, one live oak, and one cottonwood. No Heritage Trees were found within the project area. Construction of the project would require clearing of a number of existing trees and shrubs. The water storage tank site would require a permanent conversion of woody species to maintained grasses and forbs that would be periodically mowed. Construction of the water reuse line from the existing infrastructure connection to the storage tank would also require removal of a number of trees and shrubs, which could include one or more protected trees.

3.5 Wildlife Resources

Commonly occurring mammal species that would be expected in the project area include but are not limited to: the Virginia opossum (*Didelphis virginiana*), fox squirrel (*Sciurus niger*), cotton rat (*Sigmodon hispidus*), house mouse (*Mus musculus*), eastern cottontail (*Sylvilagus floridanus*), and raccoon (*Procyon lotor*). Common reptile species include the green anole (*Anolis carolinensis*), Mediterranean gecko (*Hemidactylus turcicus*), collared lizard (*Crotaphytus collaris*), and checkered garter snake (*Thamnophis marcianus*). Frequent bird species would include Northern Mockingbird (*Mimus polyglottos*), Northern Cardinal (*Cardinalis cardinalis*), Blue Jay (*Cyanocitta cristata*), Carolina Chickadee (*Parus carolinensis*), Tufted Titmouse (*Parus bicolor*), White-winged Dove (*Zenaida asiatica*), Mourning Dove (*Zenaida macroura*), Common Grackle (*Quiscalus quiscula*), Great-tailed Grackle (*Quiscalus mexicanus*) and Black Vulture (*Coragyps atratus*).

Anticipated Impacts: Anticipated direct impacts to wildlife resources would be minor. A few individual wildlife animals would potentially be locally affected by loss of denning or nesting sites or by increased competition for feeding within remaining habitat areas. However, this change would have barely perceptible consequences to the local species populations or habitat function. Sufficient habitat would remain functional for maintenance of short-term viability of all occurring populations. Future indirect and long-term cumulative impacts from the project would contribute to the continuing decline of some species not tolerant to urbanization, with likely increases of species that are tolerant to increased urban development.

3.6 Surface Waters

3.6.1 Drainage Patterns

The project lies within portions of two watersheds. The two-acre tank site and most of the pipeline corridor is located entirely within the Carson Creek watershed, while a portion of the western end of the pipeline corridor near Montopolis Drive is located within the Country Club East watershed. Carson Creek is a suburban watershed with a drainage area of six square miles and approximately eight miles of streams (COA 2013b). Carson Creek discharges into the Colorado River. Country Club Creek is about seven miles long and drains approximately five square miles before emptying into the Colorado River (COA 2011). No major or minor stream tributaries from either watershed cross the project area.

Anticipated Impacts: None.

3.6.2 Floodplain

The project site does not lie within any portion of the 100-year floodplain as designated by Federal Emergency Management Agency (FEMA).

Anticipated Impacts: None.

3.6.3 Springs

There are no seeps or springs documented by the COA (2013a) within or near the project area, and none were observed during field evaluations.

Anticipated Impacts: None.

3.7 Groundwater

The project area lies over the down dip (subsurface) of the Trinity Aquifer, a major aquifer that extends across much of Central and northeastern Texas. The thickness of this aquifer can be as much as 1,900 feet in Central Texas. The Trinity Aquifer is one of the most extensive and highly used groundwater resources in Texas. Groundwater is fresh but very hard, with total dissolved solids ranging between 1,000 to 5,000 milligrams per liter, with higher concentrations occurring as the depth of the aquifer increases (George et al. 2011).

Anticipated Impacts: None.

3.8 Critical Environmental Features

Critical Environmental Features (CEFs) are defined by Sections 25-8-1 and 30-5-1 of the COA LDC as "features that are of critical importance to the protection of environmental resources, and include bluffs, canyon rimrocks, caves, sinkholes, springs, and wetlands." Pursuant to COA regulations, no construction is allowed within a 150-foot radius around a CEF (with exceptions). Investigations were performed to determine the presence of any CEFs within the project area. Results of these investigations are summarized in **Sections 3.6.1** through **3.6.6** below.

3.8.1 Springs

Springs are defined by COA Environmental Criteria Manual (ECM) 1.3.0 (B)(i)(a) as points or zones of natural groundwater discharge in upland and/or riparian zones which produce measureable flow down gradient of a source, a pool, or both, or an area characterized by the presence of a mesic plant community (during drought conditions).

Springs have been previously discussed in **Section 3.6.3**. No springs and/or seeps have been documented within the project area (Brune 2002; COA 2013a), and none were observed during field evaluations conducted in June 2013.

Anticipated Impacts: None.

3.8.2 Bluffs

Bluffs are defined by the COA LDC 25-8-1 as an abrupt vertical change in topography of more than 40 feet with an average slope of four feet of rise for one foot of horizontal travel or greater. No bluffs were identified in the project site.

Anticipated Impacts: None.

3.8.3 Canyon Rim Rocks

Canyon rim rock areas are defined as an abrupt vertical rock outcrop of more than 60 percent slope (31 degrees), greater than four feet vertically, and a horizontal extent equal to or greater than 50 feet. Canyon rim rock is common on the west side of Austin, especially along the major drainage paths that have dissected the underlying strata. No canyon rim rock areas were found in the project site.

Anticipated Impacts: None.

3.8.4 Karst Features

Karst features consisting of caves, solution cavities, and sinkholes are found throughout areas underlain by limestone strata. Large caves and solution cavities are predominantly found along fractures, fault trends, and/or within solutioned evaporate sections. The faults, fractures, and natural voids allow groundwater to move freely through the formation, which in turn promotes further solutioning of the limestone. Caves and solution features are found primarily in the area underlain by the Edwards limestone formation in the Austin area. Because the Edwards formation is located to the west of the project site approximately four miles, no karst features would be expected; and none were observed within the project area during the field visit.

Anticipated Impacts: None

3.8.5 Wells

Abandoned and unused wells, if not properly protected, can serve as an avenue for recharge to the underlying aquifer and therefore become a CEF. No abandoned or unused wells were found within the project area.

Anticipated Impacts: None

3.8.6 Wetlands

Wetlands are defined by the COA LDC (Section 25-8-282) as lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. An area shall be classified as a wetland if it meets the U.S. Army Corps of Engineers (USACE) three-parameter technical criteria as outlined in the USACE Wetlands Delineation Manual (Section D Routine Determinations) (Environmental Laboratory 1987) and regional supplements.

Field reconnaissance to determine the presence of wetlands and other waters subject to regulation by the USACE was performed in the project area on June 12, 2013. No wetlands were identified within the project area.

Anticipated Impacts: None.

3.9 Critical Water Quality Zones

Critical Water Quality Zones (CWQZ) are designated by the COA under the LDC and impose development setbacks from major waterways. According to LDC Subsection 25-8-92(A)(1), the boundaries of the CWQZ for a major waterway typically coincide with the boundaries of the 100-year floodplain, except the boundaries of a CWQZ are located not less than 200 feet and not more than 400 feet from the centerline of the waterway. The Water Quality Transition Zone (WQTZ) is parallel to the outer boundary of the CWQZ and is 300 feet wide (LDC 25-8-93). The project site does not lie within a CWQZ or WQTZ.

Anticipated Impacts: None.

4.0 Project-related Effects to Waters of the U.S.

A determination of waters subject to regulation by the USACE was conducted following the methods outlined in the *USACE Wetlands Delineation Manual* (Environmental Laboratory 1987), which defines wetlands based on three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. In general, all three criteria must be present for an area to qualify as a wetland. Some exceptions occur in disturbed areas or in newly formed wetlands, where one indicator (such as hydric soils) might be lacking. These areas are dealt with on an individual basis as outlined in the *Field Guide for Wetland Delineation* (Wetland Training Institute 1995).

In addition to the jurisdictional wetlands defined above, the Clean Water Act regulates impacts to other waters of the United States. The term *waters of the United States* has broad meaning and incorporates both deepwater aquatic habitats and special aquatic sites, including wetlands, as listed below:

1. The territorial seas with respect to the discharge of fill material.
2. Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands.
3. Tributaries to navigable waters of the United States, including adjacent wetlands.
4. Interstate waters and their tributaries, including adjacent wetlands.

Prior to the initiation of the field visit, a number of sources were consulted in an effort to become familiar with the area and locate potential waters of the U.S., including wetlands. Sources included National Wetland Inventory (NWI) and National Hydrologic Database (NHD) maps, the Travis County Soil Survey (NRCS 2006), USGS 7.5-minute quadrangle sheet (Austin East sheet) and recent aerial photography. As previously mentioned in **Section 3.6.2**, above, the project area does not lie within the 100-year floodplain as mapped by the COA Geographic Information Systems (GIS) mapper (COA 2013a).

Activities resulting in the discharge of dredged or fill materials into waters of the U.S. are regulated by the USACE, pursuant to Section 404, subsection 330.5(a)(21) of the Clean Water Act. A field evaluation was conducted on June 12, 2013, to identify waters of the U.S. on the subject tract.

Section 10 of the Rivers and Harbors Act of 1899 authorizes the USACE to regulate any work in or affecting navigable waters of the United States. No navigable waters, as designated by the USACE, occur within the proposed project area.

Based on a review of maps, aerial photography, and on-site field reconnaissance completed on June 12, 2013, no waters or wetlands subject to regulation by the USACE were found within the project area.

Anticipated Impacts: Because no wetlands or other water subject to regulation by the USACE occur within the project area, no impacts would be expected.

5.0 Threatened and Endangered Species

The following section addresses the habitat suitability and known occurrences of threatened and endangered species of potential occurrence in Travis County and the likelihood of any occurrences within the vicinity of the proposed project.

5.1 Federal – U.S. Fish and Wildlife Service Regulatory Oversight

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority to list and monitor the status of species whose populations are considered to be imperiled. This federal authority for the protection of vulnerable species was established by the Endangered Species Act (ESA) of 1973 and its subsequent amendments. Regulations supporting this act are codified and regularly updated in Sections 17.11 and 17.12 of Title 50 of the Code of Federal Regulations. Petitions for federal protection of species receive an initial review, and if the USFWS finds that listing may be warranted, the species undergoes a thorough status review. After the status review is complete, vulnerable species that qualify are either listed as threatened (T) or endangered (E) or categorized as candidates (C). Candidate species have been deferred from listing while the USFWS works on listing proposals for other species they determine are at greater risk. Vulnerability is determined based on many factors affecting the species within its range and is always linked to the best scientific data available to the USFWS. Fish and wildlife species listed as endangered or threatened by the USFWS are provided full protection. This protection includes a prohibition on direct take of the listed species in addition to indirect take such as destruction of habitat. Federal prohibition of take of listed plants is limited to federal lands; however, federal law federalizes state law prohibitions on the taking of plants. The ESA and accompanying regulations provide the necessary authority and incentive for the individual states to establish their own regulatory vehicle for the management and protection of threatened and endangered species.

5.2 State – Texas Parks and Wildlife Department Regulatory Oversight

The Texas Parks and Wildlife Department (TPWD) oversees endangered resources through the Wildlife Diversity Program. This program is responsible for maintaining county occurrence records of federally and state-listed threatened and endangered species. The program also maintains a Texas Natural Diversity Database (TxNDD) that provides specific site data and tracking information on occurrences of listed or rare animal and plant species, including unique or declining vegetation communities of concern. State-listed endangered species have limited regulatory protection. While these species cannot be taken, collected, held, or possessed

without a permit, their habitat is afforded no regulatory protection, except on tracts managed by state, federal, or private interests for conservation purposes.

Evaluation methodology consisted of researching existing endangered species databases maintained by TPWD and USFWS. In addition, other substantial ancillary information was compiled from technical reports, published papers, and results of species surveys and investigations for other projects within the vicinity of the project area. Limited field investigations were performed. This section contains summary information (habitat assessments) from those efforts in both tabular and text formats. A summary of federally and state-listed endangered and threatened species, candidate species for listing, and those species that have been petitioned for listing that could potentially occur in Travis County are included in **Table 2**. A description of these species' habitats with assessment of impacts is also included.

A total of 11 species that are federally listed as endangered could potentially occur in Travis County, including four arachnids (Bone Cave harvestman [*Texella reyesi*], Bee Creek Cave harvestman/Reddell harvestman [*Texella reddelli*], Tooth Cave pseudoscorpion [*Tartarocreagris texana*], and Tooth Cave spider [*Neoleptoneta myopica*]), two insects (Kretschmarr Cave mold beetle [*Texamaurops reddelli*] and Tooth Cave ground beetle [*Rhadine persephone*]), one amphibian (Barton Springs salamander [*Eurycea sosorum*]), and four birds (Black-capped Vireo [*Vireo atricapilla*], Golden-cheeked Warbler [*Setophaga chrysoparia*], Interior Least Tern [*Sterna antillarum athalassos*], and Whooping Crane [*Grus americana*]). Eight additional species are candidates for federal listing, including one flowering plant (bracted twistflower [*Streptanthus bracteatus]),* four mollusks (false spike mussel [*Quadrula mitchelli*], Texas fatmucket [*Lampsilis bracteata*], Texas fawnsfoot [*Truncilla macrodon*], and Texas pimpleback [*Quadrula petrina*]), one arachnid (Wharton's cave meshweaver [*Cicurina wartoni*]), one fish (smalleye shiner [*Notropis buccula*]), and one bird Sprague's Pipit [*Anthus spragueii*]. In addition, two salamanders (Jollyville Plateau salamander [*Eurycea tonkawae*] and Austin blind salamander [*Eurycea waterlooensis*]) and one bird, (the Mountain Plover [*Charadrius montanus]*), have been proposed for listing as endangered.

A total of 13 species are state-listed as endangered or threatened including five mollusks (false spike mussel, Texas fatmucket, Texas fawnsfoot, Texas pimpleback, and smooth pimpleback [*Quadrula houstonensis*]), one amphibian (Barton Springs salamander [*Eurylea waterlooersis*]), one reptile (Texas horned lizard [*Phrynosoma cornutum*]), and six birds (American Peregrine Falcon [*Falco peregrines*], Bald Eagle [*Haliaeetus leucocephalus*], Black-capped Vireo, Golden-cheeked Warbler, Interior Least Tern, and Whooping Crane). **Table 2** lists and describes each of these species and their listing status, indicates if habitat occurs in the project area, and provides a statement of project effects.

Table 2 Federal and State-Listed Endangered and Threatened Species of Potential Occurrence in Travis County With Anticipated Impacts

SPECIES	SPECIES/HABITAT DESCRIPTION	HABITAT PRESENT?	EFFECTS
FLOWERING PLANTS			
Bracted twistflower *Streptanthus bracteatus* FC	Texas endemic; shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and in canyon bottoms; several known soils include Tarrant, Brackett, or Speck over Edwards, Glen Rose, and Walnut geologic formations; populations fluctuate widely from year to year, depending on winter rainfall; flowering mid-April late May, fruit matures and foliage withers by early summer	No	None

Table 2 Federal and State-Listed Endangered and Threatened Species of Potential Occurrence in Travis County With Anticipated Impacts			
SPECIES	**SPECIES/HABITAT DESCRIPTION**	**HABITAT PRESENT?**	**EFFECTS**
MOLLUSKS			
False spike mussel *Quadrula mitchelli* ST	Possibly extirpated in Texas; probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble; one study indicated water lilies were present at the site	No	None
Texas fatmucket *Lampsilis bracteata* FC, ST	Streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and course gravel or sand in moderately flowing water	No	None
Texas fawnsfoot *Truncilla macrodon* FC, ST	Little known; possibly river and larger streams, and intolerant of impoundment; flowing rice irrigations canals, possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows	No	None
Texas pimpleback *Quadrula petrina* FC, ST	Mud, gravel and sand substrates, generally in areas with slow flow rates	No	None
Smooth pimpleback *Quadrula houstonenisis* FC, ST	Small to moderate streams and rivers as well as moderate size reservoirs; mixed mud, sand, and fine gravel, tolerates very slow to moderate flow rates, appears not to tolerate dramatic water level fluctuations, scoured bedrock substrates, or shifting sand bottoms, lower Trinity (questionable), Brazos, and Colorado River basins	No	None
ARACHNIDS			
Bone Cave harvestman *Texella reyesi* FE	Small, blind, cave-adapted harvestman endemic to a few caves in Travis and Williamson Counties	No	None
Reddell harvestman *Texella reddelli* FE	Small, blind, cave-adapted harvestman endemic to a few caves in Travis County	No	None
Tooth Cave pseudoscorpion *Tartarocreagris texana* FE	Small, cave-adapted pseudoscorpion known from small limestone caves of the Edwards Plateau	No	None
Tooth Cave spider *Neoleptoneta myopica* FE	Very small, cave-adapted sedentary spider	No	None
Wharton's cave meshweaver *Cicurina wartoni* FC	Very small, cave-adapted spider	No	None
INSECTS			
Kretschmarr Cave mold beetle *Texamaurops reddelli* FE	Small, cave-adapted beetle found under rocks buried in silt; small, Edwards limestone caves in the Jollyville Plateau	No	None
Tooth Cave ground beetle *Rhadine persephone* FE	Resident, small cave-adapted beetle found in small Edwards limestone caves in Travis and Williamson Counties	No	None
FISHES			
Smalleye shiner *Notropis buccula* FC	Endemic to upper Brazos River system and its tributaries (Clear Fork and Bosque); apparently introduced into adjacent Colorado River drainage; medium to large prairie streams with sandy substrate and turbid to clear warm water; presumably eats small aquatic invertebrates	No	None
AMPHIBIANS			
Jollyville Plateau salamander *Eurycea tonkawae* FPE	A small, lungless salamander with external gills known only from springs and waters of some caves north of the Colorado River	No	None

Table 2 Federal and State-Listed Endangered and Threatened Species of Potential Occurrence in Travis County With Anticipated Impacts			
SPECIES	**SPECIES/HABITAT DESCRIPTION**	**HABITAT PRESENT?**	**EFFECTS**
Austin blind salamander *Eurycea waterlooensis* FPE	Mostly restricted to subterranean cavities of the Edwards Aquifer; dependent upon water flow/quality from the Barton springs segment of the Edwards Aquifer; only known from the outlets of Barton springs (Sunken Gardens [old Mill] Spring, Eliza Spring, and Parthenia [Main] Spring which forms Barton Springs Pool); feeds on amphipods, ostracods, copepods, plant material, and (in captivity) a wide variety of aquatic invertebrates	No	None
Barton Springs salamander *Eurycea sosorum* FE, SE	Dependent upon water flow/quality from the Barton Springs segment of the Edwards Aquifer; only known from the outlets of Barton springs; spring dweller, but ranges into subterranean water-filled caverns; found under rocks, in gravel, or among aquatic vascular plants and algae, as available; feeds primarily on amphipods	No	None
REPTILES			
Texas horned lizard *Phrynosoma cornutum* ST	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows in soil, enters rodent burrows, or hides under rock when inactive; breeds March-September	No	None
BIRDS			
American Peregrine Falcon *Falco peregrinus anatum* ST	Occupies a wide range of habitats during migration including urban, concentrations along the coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands	No	None
Bald Eagle *Haliaeetus leucocephalus* ST	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds	No	None
Black-capped Vireo *Vireo atricapilla* FE, SE	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; returns to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nests mid-April to late summer.	No	None
Golden-cheeked Warbler *Setophaga chrysoparia* FE, SE	Juniper-oak woodlands; dependent on Ashe juniper for long, fine bark strips, only available from mature trees, used in nest construction; nests placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nests late March to early summer	No	None
Interior Least Tern *Sterna antillarum athalassos* FE, SE	Listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans; when breeding forages within a few hundred feet of colony	No	None
Mountain Plover *Charadrius montanus* FP	Nests on high plains or shortgrass prairie, on ground in shallow depression; non-breeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous	No	None
Sprague's Pipit *Anthus spragueii* FC	Only in Texas during migration and winter, strongly tied to native upland prairie, common in coastal grasslands, uncommon and rare further west; sensitive to patch size and avoids edges.	No	None
Whooping Crane *Grus americana* FE, SE	Potential migrant; breeds in the wetlands of Wood Buffalo National Park, Northwest Territory, Canada, and winters in the coastal wetlands of the Aransas National Wildlife Refuge in Aransas, Calhoun, and Refugio Counties, Texas; only remaining natural breeding population of this species	No	None
MAMMALS			
Red Wolf *Canis rufus* FE, SE	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	N/A	N/A

Sources:
Texas Parks and Wildlife Department, Wildlife Diversity, Diversity and Habitat Assessment Programs. County Lists of Texas' Special Species. Travis County, 10/2/2012. http://www.tpwd.state.tx.us/gis/ris/es/ Accessed February 27, 2013.
U.S. Fish and Wildlife Service. 2012. Endangered Species List for Travis, County
http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=48453 Accessed February 27, 2013.

United States Fish and Wildlife Service Status

FE	Endangered (in danger of extinction throughout all or a significant portion of its range)
FC	Candidate for listing; information on threats and biological vulnerability supports listing
FPE	Proposed for listing as endangered, but has lower priority than candidate species
FP	Proposed for listing, but removed as candidate species.

Texas Parks and Wildlife Department Status

SE	Listed as Endangered in the State of Texas
ST	Listed as Threatened in the State of Texas

An additional 20 species that could occur in Travis County are considered rare or sensitive by TPWD but are currently not listed as endangered or threatened by that agency or the USFWS. These species and their likelihood of occurrence in the project area are summarized in **Table 3**, below.

Table 3 Species of Potential Occurrence in Travis County Considered Rare or Sensitive by TPWD With Anticipated Impacts

SPECIES	SPECIES/HABITAT DESCRIPTION	HABITAT PRESENT?	EFFECTS
VASCULAR PLANTS			
Basin bellflower *Campanula reverchonii*	Texas endemic; among scattered vegetation on loose gravel, gravelly sand, and rock outcrops on open slopes with exposures of igneous and metamorphic rocks; may also occur on sandbars and other alluvial deposits along major rivers; flowering May-July	No	None
Boerne bean *Phaseolus texensis*	Narrowly endemic to rocky canyons in eastern and southern Edwards Plateau, occurring on limestone soils in mixed woodlands, on limestone cliffs and outcrops; frequently along creeks	No	None
Correll's false dragon-head *Physostegia correllii*	Wet, silty clay loams on streamsides, in creek beds, irrigation channels and roadside drainage ditches; or seepy, mucky, sometimes gravelly soils along riverbanks or small islands in the Rio Grande; or underlain by Austin Chalk limestone along gently flowing spring-fed creek in central Texas; flowering May-September	No	None
Texabama croton *Croton alabamensis var texensis*	Texas endemic; in duff-covered loamy clay soils on rocky slopes in forested, mesic limestone canyons; locally abundant on deeper soils on small terraces in canyon bottoms, often forming large colonies and dominating the shrub layer; scattered individuals are occasionally on sunny margins of such forests; also found in contrasting habitat of deep, friable soils of limestone uplands, mostly in the shade of evergreen woodland mottes; flowering late February-March; fruit maturing and dehiscing by early June	No	None
Warnock's coral-root *Hexalectris warnockii*	In leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creek beds in canyons; in the Trans Pecos in oak-pinyon-juniper woodlands in higher mesic canyons (to 2000 m [6550 ft]), primarily on igneous substrates; in Terrell County under *Quercus fusiformis* mottes on terrraces of spring-fed perennial streams, draining an otherwise rather xeric limestone landscape; on the Callahan Divide (Taylor County), the White Rock Escarpment (Dallas County), and the Edwards Plateau in oak-juniper woodlands on limestone slopes; in Gillespie County on igneous substrates of the Llano Uplift; flowering June-September; individual plants do not usually bloom in successive years	No	None
MOLLUSKS			
Creeper (squawfoot) *Strophitus undulatus*	Small to large streams, prefers gravel or gravel and mud in flowing water; Colorado, Guadalupe, San Antonio, Neches (historic), and Trinity (historic river basins)	No	None
CRUSTACEANS			
An amphipod *Stygobromus russelli*	Subterranean waters, usually in caves and limestone aquifers; resident of numerous caves in about 10 counties of the Edwards Plateau	No	None
Bifurcated cave amphipod *Stygobromus bifurcaus*	Found in pools within caves	No	None
Balcones Cave amphipod *Stygobromus balconis*	Found in pools within caves	No	None
ARACHNIDS			
Bandit Cave spider *Cicurina bandida*	A very small, subterrestrial, subterranean obligate	No	None

Table 3 Species of Potential Occurrence in Travis County Considered Rare or Sensitive by TPWD With Anticipated Impacts			
SPECIES	**SPECIES/HABITAT DESCRIPTION**	**HABITAT PRESENT?**	**EFFECTS**
INSECTS			
Leonora's dancer damselfly *Argia leonorae*	South central and western Texas; small streams and seepages	No	None
Rawson's metalmark *Calephelis rawsoni*	Moist areas in shaded limestone outcrops in central Texas, desert scrub or oak woodland in foothills, or along rivers elsewhere; larval hosts are *Eupatorium havanense, E. greggii*	No	None
Tooth Cave blind rove beetle *Cylindropsis sp*	Only one specimen collected from Tooth Cave; only known North American collection of this genus	No	None
FISHES			
Guadalupe bass *Micropterus treculii*	Endemic to perennial streams of the Edwards Plateau region; introduced in the Nueces River system	No	None
AMPHIBIANS			
Pedernales River springs salamander *Eurycea sp 6*	Endemic; known only from vicinity of Pedernales Springs	No	None
REPTILES			
Spot-tailed earless lizard *Holbrookia lacerata*	Central and southern Texas and adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground	No	None
Texas garter snake *Thamnophis sirtalis annectens*	Wet or moist microhabitats, but not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August	No	None
BIRDS			
Western Burrowing Owl *Athene cunicularia hypugaea*	Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows	No	None
MAMMALS			
Cave myotis bat *Myotis velifer*	Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and in abandoned cliff swallow nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of the Edwards Plateau and gypsum caves of the Texas panhandle region during winter; opportunistic insectivore	No	None
Plains spotted skunk *Spilogale putorius interrupta*	Found in open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie	Yes	Impacts Possible

Source:
Texas Parks and Wildlife Department, Wildlife Diversity, Diversity and Habitat Assessment Programs. County Lists of Texas' Special Species. Travis County, 10/2/2012. http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx Accessed April 29, 2013.

The American Peregrine Falcon, Arctic Peregrine Falcon, and Whooping Crane are potential migrants through the proposed project area. The Bald Eagle could infrequently occur as a temporary transient. However, it is not anticipated that the proposed project would affect these species. It is not anticipated that there would be any effects on the threatened or endangered species dependent upon the Edwards Aquifer, juniper-oak woodlands, or open arid regions. The proposed project area lies outside the portion of Travis County that identifies Karst Zones on maps produced by Veni (1992), therefore, it is not anticipated that the proposed project would affect any of the listed threatened or endangered species occurring in karst (subterranean) formations.

Results of a search of TPWD's TxNDD were received on May 8, 2013. The data search indicated that no occurrences of threatened or endangered species have been documented within or adjacent to the project area. Although this does not conclusively support the absence of listed species, the information does corroborate habitat evaluations which indicate that

suitable habitat does not occur for any of the listed species that could potentially occur in Travis County.

Anticipated Impacts: No adverse impacts to any endangered or threatened species would be expected from the project.

The Texas garter snake (*Thamnophis sirtalis annectens*), designated as rare but not listed as endangered or threatened by TPWD, has been documented within 0.46 mile of the project area (**Figure 7**). This species, along with the plains spotted skunk (*Spilogale putorius interrupta*) (also designated as rare), may occur in the project area. Direct injury or harm can be avoided by allowing escape of any animals encountered with minimal or no disturbance. Impacts to habitat would be minor, as disturbed areas would be revegetated following construction, and would not be expected to affect overall population numbers or distribution.

6.0 Cultural Resources

Following initial coordination with the Texas Historical Commission (THC) (**Attachment 1**), archeological resource investigations were conducted under Texas Antiquities Committee (TAC) Permit #6565 in accordance with the THC and the Council of Texas Archeologists (CTA) guidelines for intensive linear surveys with archeologists from Hicks & Company surveying 100 percent of the proposed project area on foot. During survey, a total of nine shovel tests were excavated, and one prehistoric-age lithic scatter was encountered and recorded as Site 41TV2438. The observed artifact assemblage of this surficial, upland site consisted of a biface, two cores, a few tested cobbles, and small amounts of lithic debitage. Shovel tests conducted at Site 41TV2438 were negative, and no buried cultural deposits or features were noted. Due to a lack of chronological or cultural diagnostics, the lack of datable components that would add valuable data to the archeological record, and a small assemblage size that is very typical of the area, Site 41TV2438 is recommended as ineligible for listing as a State Archeological Landmark (SAL). Following survey, Hicks & Company recommended that the proposed undertaking should be allowed to proceed to construction with no further archeological investigations required. Comment by the THC is forthcoming.

Anticipated Impacts: No impacts to archeological deposits considered eligible for listing as SALs or on the National Register of Historic Places (NRHP) would be expected as a result of this project.

7.0 Summary

Impacts to geology and soils within the project area would be negligible. Adverse impacts to existing vegetation would be expected as some trees and shrubs would be cleared during construction of the water reuse line and tank. Specific impacts to protected trees are currently not known. This information could be determined by the results of a tree survey, which was not included in this scope of services.

Minor direct impacts would be expected to some individual wildlife species, but impacts would be very localized and would not affect overall habitat function for occurring species in general. Future indirect and cumulative effects would vary according to the species affected, with expected increases in populations of wildlife species tolerant of urbanization and decreases in populations of species not tolerant to urbanization.

No impacts to federally or state-listed endangered or threatened species would be expected.

No impacts to surface water or groundwater would be expected. No waters of the U.S., including wetlands, subject to regulation by the USACE under Section 404 of the Clean Water Act would be impacted by the proposed project.

No impacts to COA designated CEFs would be expected from the project.

No impacts to prehistoric or historic-age archeological resources would be expected from the project.

8.0 REFERENCES

Bureau of Economic Geology (BEG). 1981. Geologic atlas of Texas: Austin Sheet. University of Texas at Austin, TX.

_____. 2007. Geologic map database of Texas. http://pubs.usgs.gov/ds/2005/170/ Accessed May 2, 2013.

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FIGURES

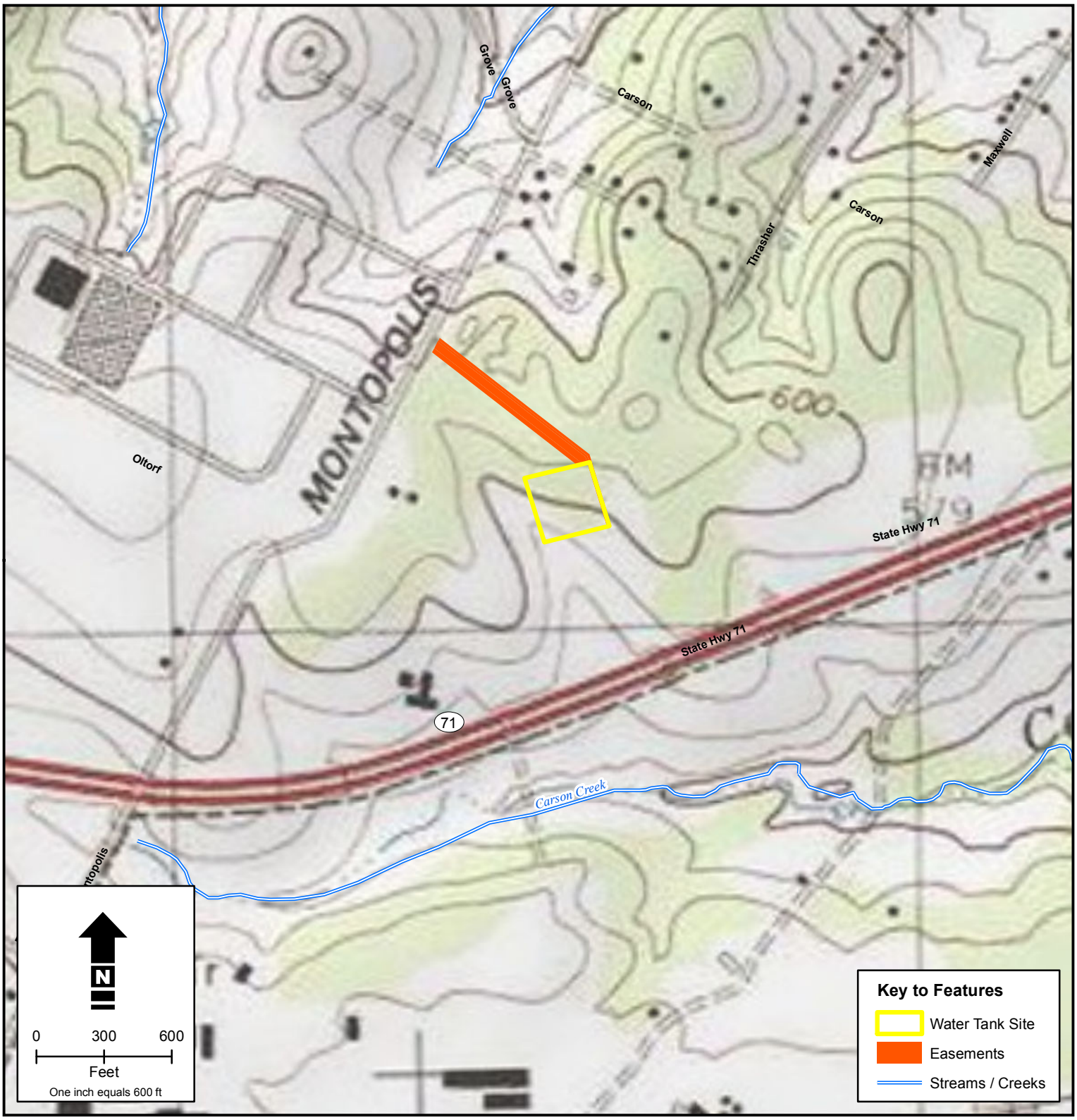


Figure 1

Project Location

Montopolis Water Reuse Site

USGS 7.5-minute Topographic Quadrangle:
Montopolis, TX

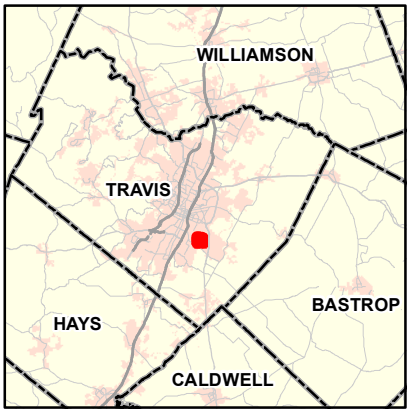
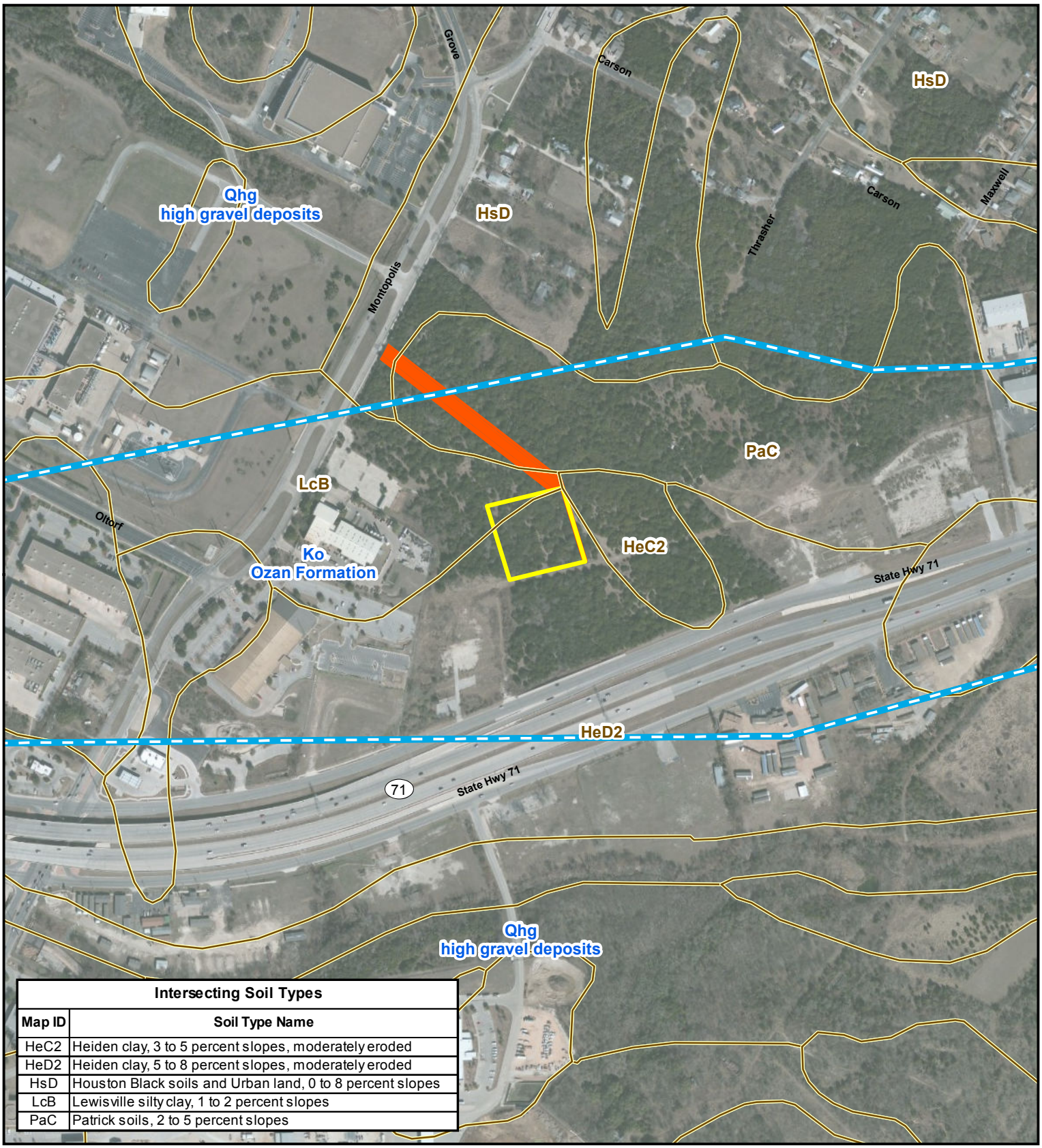


Figure 2. Looking northwest along transmission line corridor.

Figure 3. Looking northwest toward center of water reuse tank site.

Figure 4. Upper end of swale looking down slope.

Figure 5. Looking down slope toward incised rocky outcrop within pipeline line corridor.



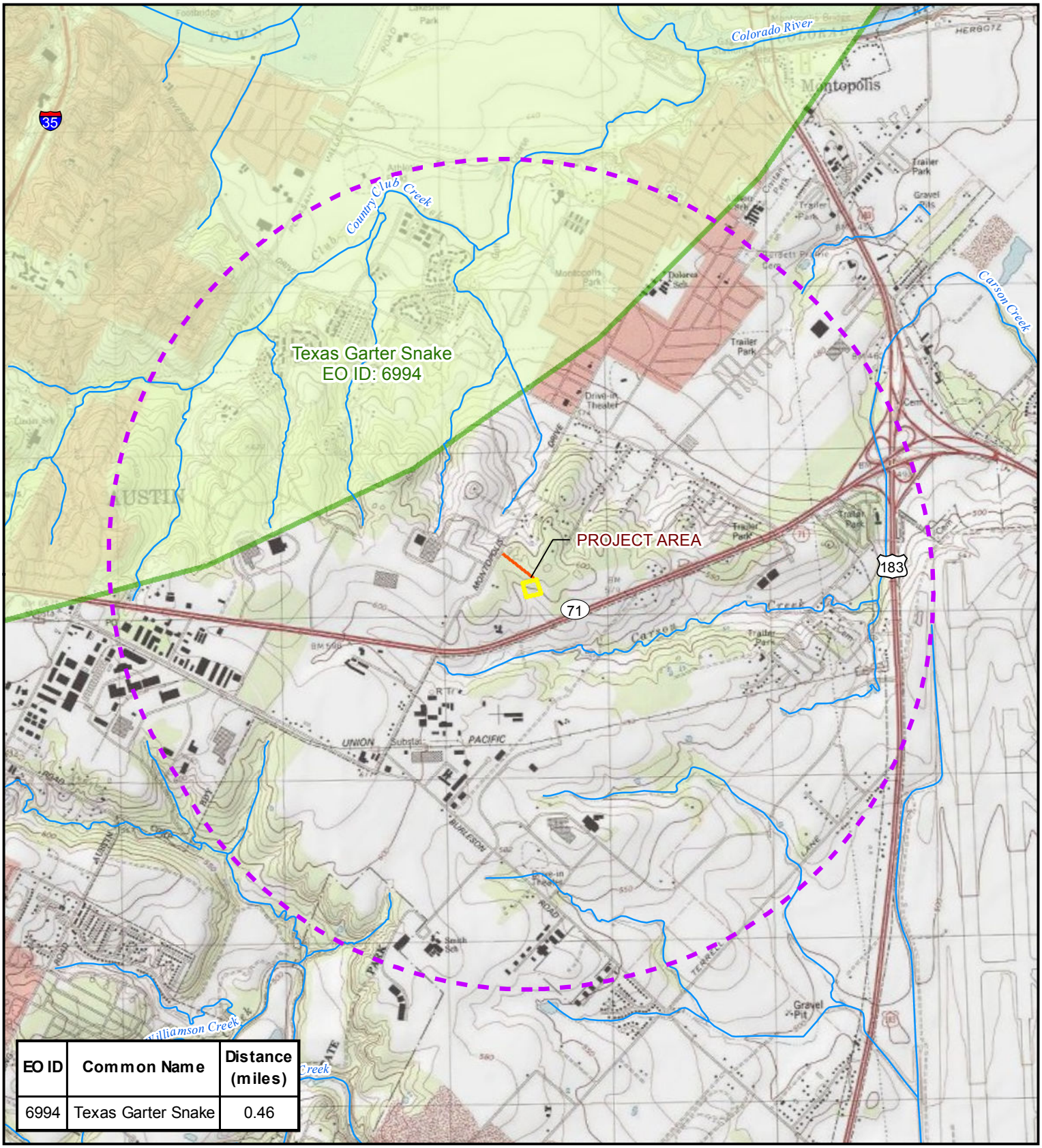
Intersecting Soil Types	
Map ID	**Soil Type Name**
HeC2	Heiden clay, 3 to 5 percent slopes, moderately eroded
HeD2	Heiden clay, 5 to 8 percent slopes, moderately eroded
HsD	Houston Black soils and Urban land, 0 to 8 percent slopes
LcB	Lewisville silty clay, 1 to 2 percent slopes
PaC	Patrick soils, 2 to 5 percent slopes

N

0 250 500
Feet
One inch equals 500 ft

Figure 6
Geology and Soils
Montopolis Water Reuse Site

Key to Features
- Geology Boundaries
- Soil Type Boundaries
- Water Tank Site
- Easements



EO ID	Common Name	Distance (miles)
6994	Texas Garter Snake	0.46

N

0 0.25 0.5

Miles

One inch equals .5 miles

Figure 7

TxNDD Occurrences

Montopolis Water Reuse Site

USGS 7.5-minute Topographic Quadrangle:
Montopolis, TX

Key to Features

- 1.5 Mile Search Radius
- TxNDD Occurrences
- Water Tank Site
- Easements

ATTACHMENT 1
TEXAS HISTORICAL COMMISSION COORDINATION

HICKS & COMPANY

ENVIRONMENTAL
ARCHEOLOGICAL
AND PLANNING
CONSULTANTS

May 3, 2013

Mark Wolfe
State Historic Preservation Officer
Attn: Mark Denton
Texas Historical Commission
P.O. Box 12276 – Capitol Station
Austin, Texas 78711

RE: Antiquities Code of Texas Coordination for the City of Austin's Proposed Montopolis Tank Site, Travis County, Texas

Dear Mr. Wolfe,

The City of Austin (the City) is currently proposing to construct a new water reuse storage tank and pump station between Montopolis Drive and State Highway (SH) 71 on a to-be-purchased lot approximately two acres in size (**Figure 1**). Additionally, 1.2 acres of easements, required for a water reuse line and an associated access road, are proposed as part of this project. Hicks & Company has been contracted by CH2M Hill Corporation to conduct cultural resource background investigations, identify known resources, and assess the potential for unrecorded cultural resources to occur within and adjacent to the project area, and present this information to the Texas Historical Commission (THC), requesting recommendations regarding any need for archeological survey prior to construction. The proposed project will occur on land to be owned by the City and, as such, is subject to the Antiquities Code of Texas (ACT).

According to the THC Online Sites Atlas (the Atlas) accessed on May 1, 2013, there have been no previous archeological surveys within the proposed project area (**Figure 1**). The nearest recorded survey, located adjacent to the proposed project's western terminus, is an unnamed survey of the Montopolis Road alignment. Other surveys documented within one kilometer of the proposed project include a linear survey conducted on behalf of the State Department of Highways and Public Transportation in 1986 and an areal survey conducted by the LCRA in 2001 under Texas Antiquities Permit #2537. During this survey, Site 41TV1951 was recorded. Located adjacent to a previously undocumented spring, this prehistoric site is described by Prikryl (in the Atlas) as one of "two of the most significant prehistoric cultural resource sites discovered in recent years during LCRA surveys." Additionally, although no details of its

components are available on the Atlas, archeological Site 41TV1697 is located approximately 720 meters southeast of the proposed project location.

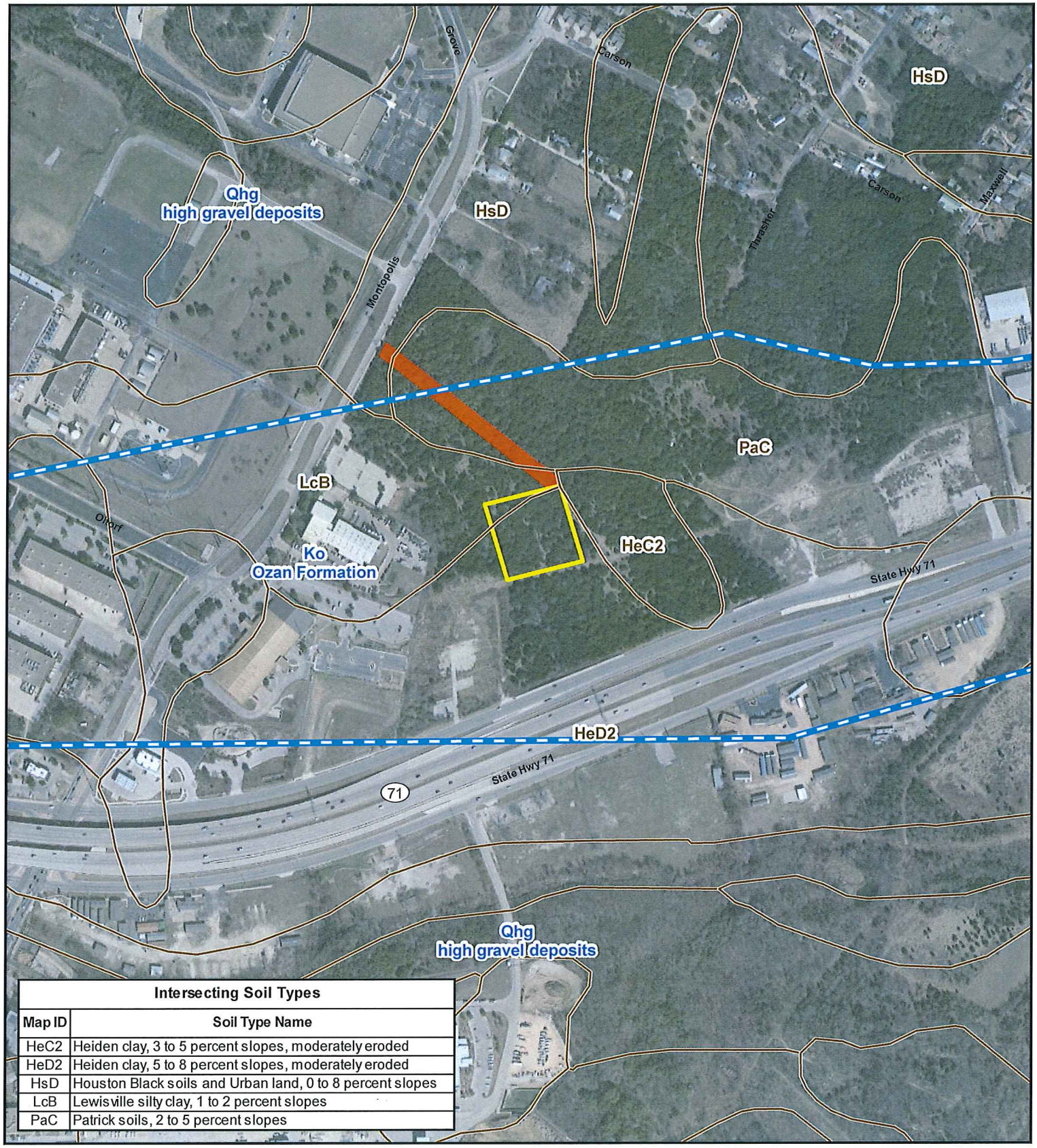
Geologically, the proposed project area is situated above the Ozan Formation (Oz) dating to the Cretaceous and, at its northern terminus, high gravel deposits (Qhg) dating to the beginning of the Early Pleistocene (**Figure 2**). The Ozan Formation is comprised of clay, marly, calcareous content that decreases upward. Characteristic nodules of hematite and pyrite and silt-size quartz and calcite fragments abound and become more abundant upward where shape is blocky and fractures conchoidal. This geologic formation predates the arrival of humans in the Americas; as such cultural deposits in these areas would likely be close to the surface in overlying sediment or on the surface itself. High gravel deposits in the Austin area are fluviatile terrace formations representing former levels of the Colorado River and its tributaries. Commonly, the matrix can be composed of gravel, silts, sands, and clays. This geologic formation coincides with the arrival of humans in the Americas; as such, cultural deposits in these areas could be buried below the surface. However, artifacts located within the gravel beds of the high terrace deposits would not likely be in- situ.

According to the United States Department of Agriculture's Web Soil Survey for Travis County, soils within the proposed project area consist of Heiden clay, 5 to 8 percent slopes, moderately eroded; Patrick soils, 2 to 5 percent slopes; Lewisville silty clay, 1 to 2 percent slops; and Houston Black soils and urban land, 0 to 8 percent slopes (**Figure 2**). Heiden clay is derived from clayey residuum weathered from Eagleford shale or Taylor marl. Both the Patrick and Lewisville series are parented from quaternary alluvium derived from mixed sources typically located on terrace landforms. As deposits potentially formed during the Prehistoric Period, these soils have potential to contain intact archeological sites or features. Houston Black soils and urban land, 0 to 8 percent slopes, in approximation, consists of 56 percent Houston Black clay, 30 percent urban land, and about 14 percent other soils, including but not limited to Heiden and Burleson clay. This unit is located on ridges and foot slopes and urban areas.

On behalf of the City of Austin, Hicks & Company presents this letter to the THC to inform your office of the proposed project and to request THC's concurrence that intensive archeological survey, supplemented with shovel testing, is warranted for regulatory compliance under the ACT prior to construction.

Sincerely,

Josh Haefner
Senior Archeologist



Intersecting Soil Types	
Map ID	Soil Type Name
HeC2	Heiden clay, 3 to 5 percent slopes, moderately eroded
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N

0 75 150
Meters
One inch equals 150 meters

Figure 2
Geology and Soils
Montopolis Water Reuse Site

Key to Features
- Geology Boundaries
- Soil Type Boundaries
- Water Tank Site
- Easements

1504 WEST 5TH STREET AUSTIN, TEXAS 78703 TEL: 512 / 478.0858 FAX: 512 / 474.1849

HICKS & COMPANY

ENVIRONMENTAL
ARCHEOLOGICAL
AND PLANNING
CONSULTANTS

LETTER OF TRANSMITTAL

DATE: May 31, 2013

TO: Mark Wolfe
Attn: Mark Denton
Texas Historical Commission

RE: Antiquities Code of Texas Coordination for the City of Austin's proposed Montopolis Water Reuse Tank

Enclosed please find the following items:

# of Items	Description
1	Permit Application for Intensive Archeological Survey
1	SOW, outlining methodology for Intensive Archeological Survey

Signed: _____

Josh Haefner
Senior Archeologist

TEXAS HISTORICAL COMMISSION

ANTIQUITIES PERMIT APPLICATION FORM
ARCHEOLOGY

GENERAL INFORMATION

I. PROPERTY TYPE AND LOCATION

Project Name (and/or Site Trinomial) Montopolis Water Reuse Site
County (ies) Travis County
USGS Quadrangle Name and Number Montopolis (USGS#: 30097-B6)

UTM Coordinates Zone 14 E 624499 (Centroid) N 3343368 (centroid)
Location East Austin, Travis County
Federal Involvement Yes XX No
Name of Federal Agency
Agency Representative

II. OWNER (OR CONTROLLING AGENCY)

Owner City of Austin
Representative Dan W Pedersen, PE
Address 625 E 10th Street, Suite 100

City/State/Zip ~~Austin TX 78745~~ Austin, TX 78701
Telephone (include area code) 512-972-0074 Email Address dan.pedersen@austintexas.gov

III. PROJECT SPONSOR (IF DIFFERENT FROM OWNER)

Sponsor same as above
Representative
Address
City/State/Zip
Telephone (include area code) Email Address

PROJECT INFORMATION

I. PRINCIPAL INVESTIGATOR (ARCHEOLOGIST)

Name Josh Haefner
Affiliation Hicks & Company
Address 1504 W. 5th Street
City/State/Zip Austin, Tx. 78703
Telephone (include area code) 512-478-0858 Email Address jhaefner@hicksenv.com

(OVER)

ANTIQUITIES PERMIT APPLICATION FORM (CONTINUED)

II. PROJECT DESCRIPTION

Proposed Starting Date of Fieldwork June 28, 2013
Requested Permit Duration 3 Years _____ Months (1 year minimum)
Scope of Work (Provided an Outline of Proposed Work) Intensive Survey (see attached scope of work)

III. CURATION & REPORT

Temporary Curatorial or Laboratory Facility Hicks & Company
Permanent Curatorial Facility Texas Archeology Research Laboratory (TARL) or Center for Archeological Studies (CAS) at Texas State University

IV. LAND OWNER'S CERTIFICATION

I, Dan W Pedersen, as legal representative of the Land Owner, City of Austin, do certify that I have reviewed the plans and research design, and that no investigations will be preformed prior to the issuance of a permit by the Texas Historical Commission. Furthermore, I understand that the Owner, Sponsor, and Principal Investigator are responsible for completing the terms of the permit.
Signature Dan W Ped Date 5/31/13

V. SPONSOR'S CERTIFICATION

I, Dan W Pedersen, as legal representative of the Sponsor, City of Austin, do certify that I have review the plans and research design, and that no investigations will be performed prior to the issuance of a permit by the Texas Historical Commission. Furthermore, I understand that the Sponsor, Owner, and Principal Investigator are responsible for completing the terms of this permit.
Signature Dan W Ped Date 5/31/13

VI. INVESTIGATOR'S CERTIFICATION

I, Josh Haefner, as Principal Investigator employed by Hicks & Company (Investigative Firm), do certify that I will execute this project according to the submitted plans and research design, and will not conduct any work prior to the issuance of a permit by the Texas Historical Commission. Furthermore, I understand that the Principal Investigator (and the Investigative Firm), as well as the Owner and Sponsor, are responsible for completing the terms of this permit.
Signature _____ Date 5/30/13

Principal Investigator must attach a research design, a copy of the USGS quadrangle showing project boundaries, and any additional pertinent information. Curriculum vita must be on file with the Division of Antiquities Protection.

FOR OFFICIAL USE ONLY

Reviewer _____ Date Permit Issues _____
Permit Number _____ Permit Expiration Date _____
Type of Permit _____ Date Received for Data Entry _____

Texas Historical Commission
Archeology Division
P.O. Box 12276, Austin, TX 78711-2276
Phone 512/463-6096
www.thc.state.tx.us

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

HICKS & COMPANY

ENVIRONMENTAL
ARCHEOLOGICAL
AND PLANNING
CONSULTANTS

Hicks & Company's Scope of Work
for the
City of Austin's Proposed Montopolis Tank Site Project
Travis County, Texas
May 31, 2013

Pursuant to the Texas Historical Commission's (THC) recommendation regarding the City of Austin's responsibilities for the above referenced project (letter, Martin to Haefner, May 3, 2013), this scope of work describes an intensive archeological survey of the proposed **Montopolis Tank Site, Travis County, Texas**. The proposed project consists of constructing a new water reuse storage tank and pump station between Montopolis Drive and State Highway (SH) 71 on a lot approximately two acres in size (**Figure 1**). Additionally, 1.2 acres of easements, required for a water reuse line and an associated access road, are proposed as part of this project. The project is being funded by the City through the Austin Water Utility department and, as such, is subject to the Antiquities Code of Texas (ACT).

Since the proposed project overlays geological formations that predate the arrival of humans in the Americas, cultural deposits in these areas would likely be close to the surface in overlying sediment or on the surface itself (**Figure 2**). Therefore Hicks & Company is proposing that pedestrian survey supplemented with shovel testing as an adequate methodology to assess the proposed project's potential to impact undocumented archeological resources/sites. The project area will be tested at a rate of no less than three subsurface tests per acre, in accordance with the THC's minimum standards for intensive areal archeological surveys. Investigators will record their observations and the results of shovel tests through notes, standardized shovel test forms, and photographs. Shovel tests will be excavated to a depth of one meter, bedrock, or culturally sterile soils, whichever is encountered first. Sediment from all shovel tests will be screened through ¼-inch hardware cloth, and cultural material will be recorded but returned to the hole once the test is complete. Shovel test locations will be recorded utilizing GPS technology. The survey will follow a no-collection policy in which artifacts will be recorded, identified, and quantified in the field but returned to their find location.

Any archeological sites identified during the survey will be investigated by means of no fewer than six shovel tests in order to define site boundaries relative to the project area. Identified sites will be recorded in accordance with the THC's standards for site investigation. Subsurface tests within sites will be excavated at a frequency and arrangement appropriate for assessing site size, depth, and significance. Site locations will be recorded utilizing GPS technology, and data will be recorded on standardized

forms. Documented sites will be recorded at the Texas Archeological Research Laboratory (TARL) and new trinomials will be assigned.

The results of the investigation will be compiled into a professional report as required under Chapter 26 of the THC's Rules of Practice and Procedure. The report will include a summary of background information, results of field investigations, and recommendations about the need for further investigations (if any) with respect to both historic and prehistoric sites and will be submitted to THC for review and comment. In accordance with revised ACT requirements, hard copies and digital files of the final report will be submitted to the THC and other recommended libraries and repositories across Texas. Additionally, if sites are recorded within the study corridor, all project-generated forms, notes, photographs, etc. will be formally curated at TARL.

Appendix J – Archeological Investigations Report

REPORT ON THE ARCHEOLOGICAL INVESTIGATIONS OF THE MONTOPOLIS WATER REUSE SITE, TRAVIS COUNTY, TEXAS

Principal Investigator:
Josh Haefner

Written by:
Josh Haefner and Gregg Cestaro

TAC Permit #6565

Submitted to:
City of Austin

Hicks & Company Archeology Series #248

August 2013

HICKS & COMPANY
ENVIRONMENTAL
ARCHEOLOGICAL
AND PLANNING
CONSULTANTS

ABSTRACT

In June of 2012, Hicks & Company archaeologists completed a 100-percent archaeological survey of the proposed City of Austin's Montopolis Water Reuse Site project, located in southeastern Travis County, Texas. The survey was conducted for CH2M Hill on behalf of Travis County and the City of Austin Waterworks Department for Antiquities Code of Texas compliance and was coordinated with the Texas Historical Commission under Texas Antiquities Code Permit #6565. The proposed project includes the construction of a water reuse storage tank and an associated underground pipeline that will connect the storage tank with existing water reuse infrastructure located along Montopolis Drive. The site location for the storage tank is approximately 2.01 acres in size. The pipeline corridor is approximately 260 meters long by 20 meters in width for a total of 1.225 acres. The total footprint area for the project is approximately 3.24 acres. The survey consisted of pedestrian surface inspection supplemented by shovel testing (*n*=9) within the proposed project's footprint, resulting in the recordation of one new prehistoric site, Site 411TV2438. This small upland, surficial lithic scatter consists of a 3-4 cores, 2-3 tested cobbles, and very small amounts of debitage, loosely scattered along a slight slope at the northeast corner of the proposed water tank location. Site 41TV2438 is not eligible for listing as a State Archaeological Landmark. The survey followed a no-collection policy, and all artifacts were returned to their find location.

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MANAGEMENT SUMMARY

Hicks & Company archaeologists, working on behalf of the City of Austin (the City) and CH2M Hill, the project's design engineer, conducted a 100-percent archaeology survey for the City's proposed Montopolis Watertank Reuse project located between Montopolis Drive and State Highway (SH) 71 (**Figure 1**). As planned, the proposed project will consist of the installation of a new waterline and an access road within a corridor approximately 260 meters in length by 20 meters in width. Additionally, the proposed project would include the installation of a new water tank and pump station facility to be located within a lot 2.01 acres in size for a total area of potential effects of 3.24 acres.

Investigations were conducted under Texas Antiquities Code (TAC) Permit #6565 in accordance with the Texas Historical Commission (THC) and the Council of Texas Archaeologists (CTA) guidelines for intensive areal surveys with archaeologists from Hicks & Company surveying 100 percent of the proposed project on foot. During survey, a total of 9 shovel tests were excavated and one prehistoric-age surficial lithic scatter was encountered and recorded as Site 41TV2438. The observed artifact assemblage of this upland site consisted of a bifacial core, 2-3 multidirectional cores, a few tested cobbles, and small amounts of lithic debitage. Shovel tests conducted at Site 41TV2438 were negative and no buried cultural deposits or features were noted. Due to a lack of chronological or cultural diagnostics, the lack of datable components that would add valuable data to the archaeological record, and a small assemblage size that is very typical of the area, Site 41TV2438 is recommended as ineligible for listing as a State Archaeological Landmark (SAL). Hicks & Company recommends that the proposed undertaking should be allowed to proceed to construction with no further archaeological investigations required.

Fieldwork for the archaeological survey was conducted on June 12, 2013, requiring approximately five hours to complete. Josh Haefner served as Principal Investigator for the project, and Gregg Cestaro served as Project Archaeologist. Gregg Cestaro and Josh Haefner conducted the survey and authored the report. Jerod McCleland, as GIS specialist, produced the maps and graphics for the report. Subsequent sections of this report include environmental and cultural backgrounds with a brief discussion of previous surveys and recorded sites, a description of field methodology, and a discussion of the results of the field investigation. This is followed by a conclusion section containing formal regulatory recommendations. Also included as are shovel tests results and isolated find information (**Appendix A**), and locations of shovel tests and Site 41TV2438 (**Appendix B**). All project-generated notes, forms, and photographs will be curated at the Texas Archaeological Research Laboratory (TARL) in Austin, Texas. This report is offered in partial fulfillment of TAC Permit #6565.

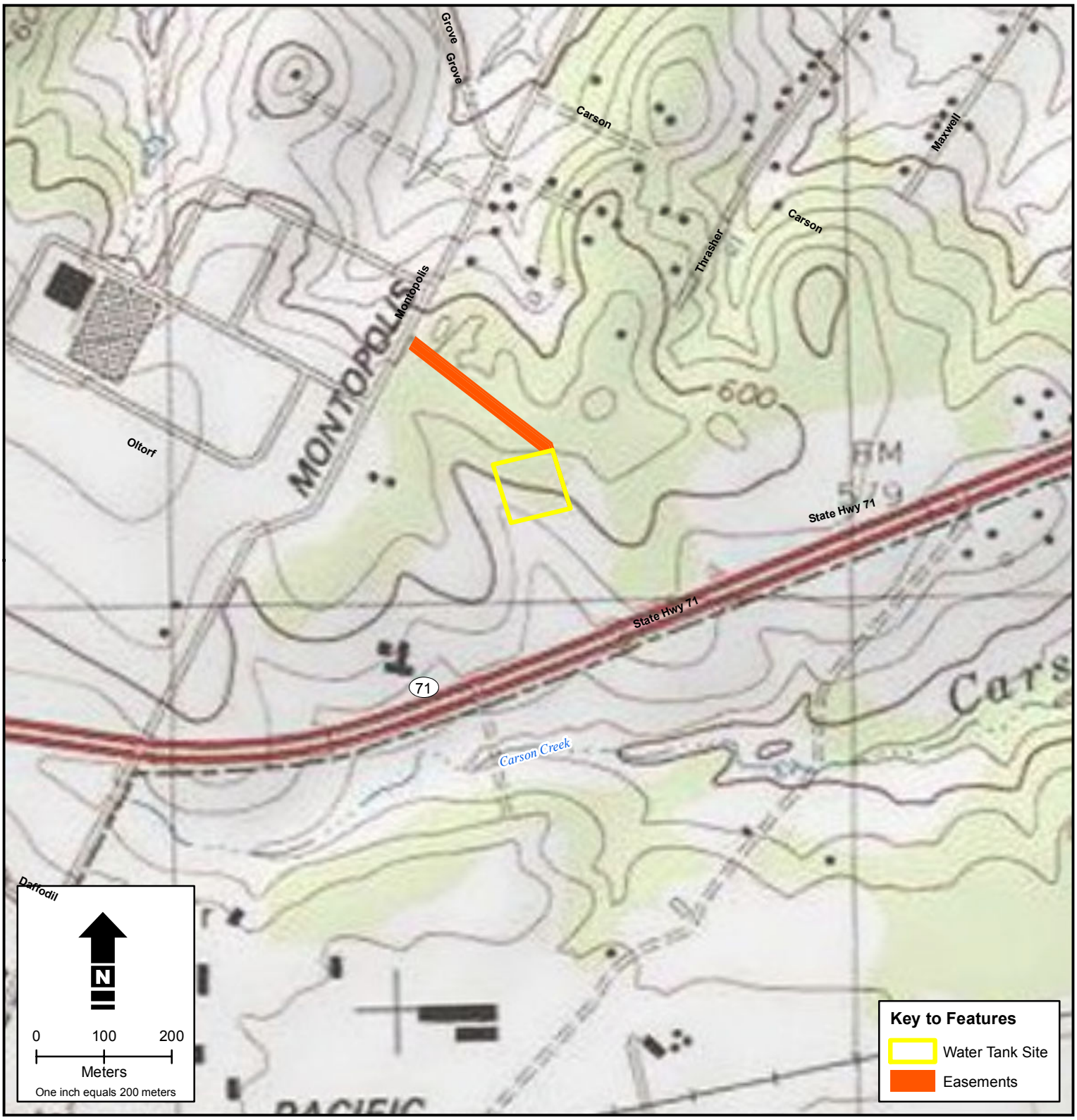
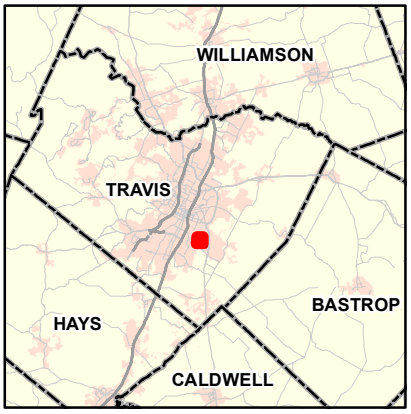


Figure 1

Project Location

Montopolis Water Reuse Site

USGS 7.5-minute Topographic Quadrangle:
Montopolis, TX



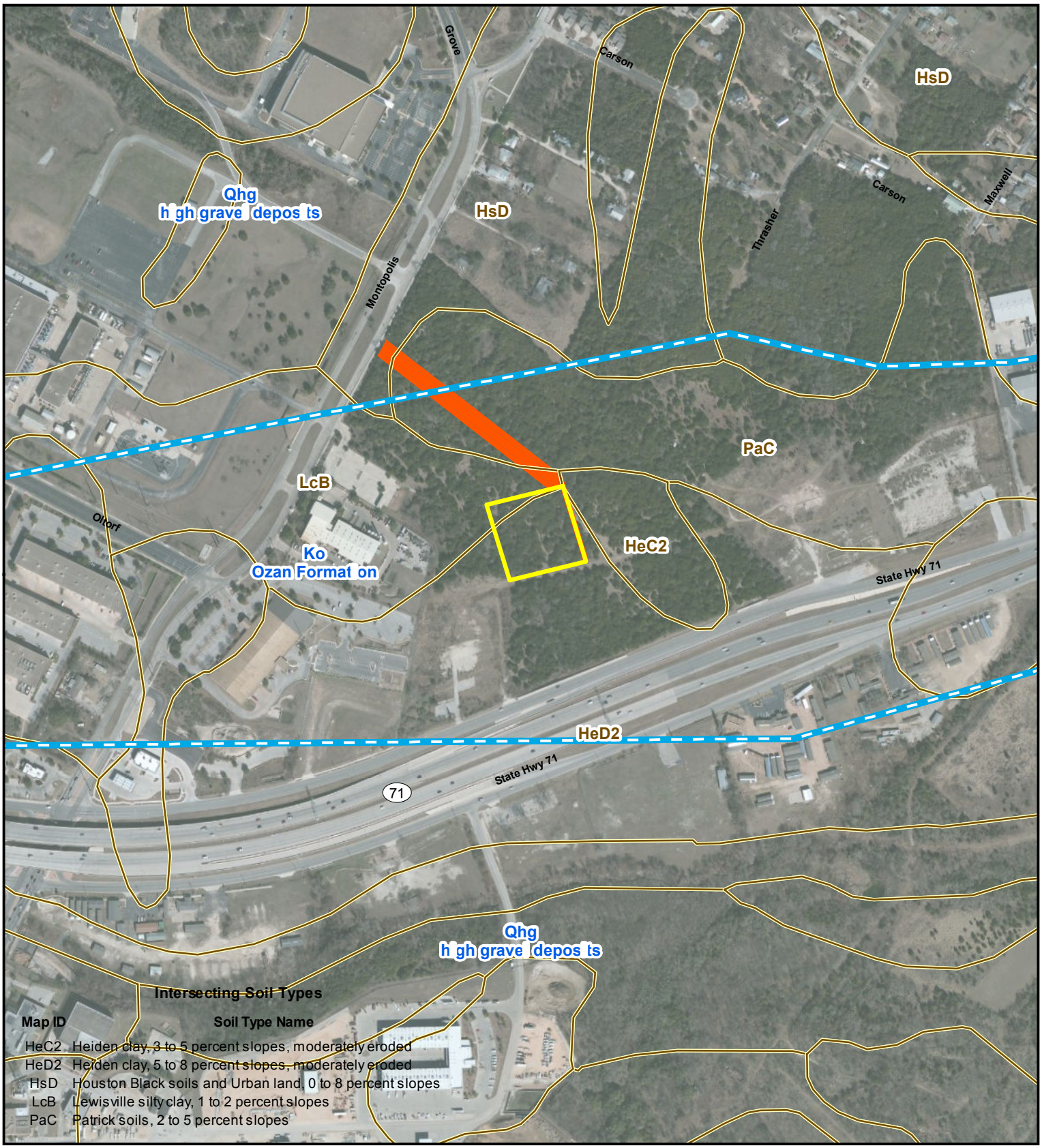
ENVIRONMENTAL SETTING

Geology and Topography

Geologically, the proposed project area is situated above the Ozan Formation (Oz) dating to the Cretaceous and, at its northern terminus, high gravel deposits (Qhg) dating to the beginning of the Early Pleistocene (**Figure 2**) (BEG 1972**)**. The Ozan Formation is comprised of clay, marly, calcareous content that decreases upward. Characteristic nodules of hematite and pyrite and silt-size quartz and calcite fragments abound and become more abundant upward where shape is blocky and fractures conchoidal. This geologic formation predates the arrival of humans in the Americas; as such, cultural deposits in these areas would likely be close to the surface in overlying sediment or on the surface itself. High gravel deposits in the Austin area are fluviatile terrace formations representing former levels of the Colorado River and its tributaries. Commonly, the matrix can be composed of gravel, silts, sands, and clays. This geologic formation coincides with the arrival of humans in the Americas; as such, cultural deposits in these areas could be buried below the surface. However, artifacts located within the gravel beds of the high terrace deposits would not likely be in- situ.

Soils

According to the United States Department of Agriculture's Web Soil Survey for Travis County, soils within the proposed project area consist of Heiden clay, 5 to 8 percent slopes, moderately eroded; Patrick soils, 2 to 5 percent slopes; Lewisville silty clay, 1 to 2 percent slops; and Houston Black soils and urban land, 0 to 8 percent slopes (**Figure 2**) (Werchan et al. 1974). Heiden clay is derived from clayey residuum weathered from Eagleford shale or Taylor marl. Both the Patrick and Lewisville series are parented from quaternary alluvium derived from mixed sources typically located on terrace landforms. As deposits potentially formed during the Prehistoric Period, these soils have the potential to contain intact archeological sites or features. Houston Black soils and urban land, 0 to 8 percent slopes, in approximation, consists of 56 percent Houston Black clay, 30 percent urban land, and about 14 percent other soils, including but not limited to Heiden and Burleson clay. This unit is located on ridges, foot slopes, and urban areas.



N

0 75 150

Meters

One inch equals 150 meters

Figure 2

Geology and Soils

Montopolis Water Reuse Site

Key to Features

- Geology Boundaries
- Soil Type Boundaries
- Water Tank Site
- Easements

CULTURAL BACKGROUND

Central Texas Archaeological Region

The project area is located within the Central Texas Archaeological Region (**Figure 3**). As defined by Prewitt (1981) and later modified by Collins (2004), the Central Texas Archaeological Region encompasses an area that is nearly 84,300 square kilometers in size. This region extends from the city of Uvalde northwestward to Sonora and, from here, northward to just beyond the city of Paint Rock onto the Grand and Rolling Plains. Moving northeast from Paint Rock, the city of Cleburne marks the northern most point of the Central Texas archaeological region. From here, the area extends southeast, beyond Waco into the Blackland Prairie and further south to just north of the city of Floresville. Like most other archaeological regions, the boundaries for the Central Texas region are ephemeral, subject to reinterpretation as more and more work is done. Ellis and Black (1997:25) discuss the ephemeral nature in defining exact boundaries for a Central Texas "archaeological region" citing inherent difficulties due to "considerable environmental diversity". Implicit with these difficulties is the danger of assuming for the area a single ethnic or cultural identity. In all of its various iterations the core of the Central Texas Archaeological region has always been the Edwards Plateau (Hester 1989).

Most of the recent chronologies for Central Texas are based on six distinct time periods, roughly representing a 12000 year sequence of occupation. A synthesis of the culture-historical sequences provided by Collins (2004) and Johnson (1995) is as follows: Paleoindian (prior to 8800 before present [BP]), Early Archaic (8800–5800 BP), Middle Archaic (5800–4000 BP), Late Archaic (4000–1400 BP), Late Prehistoric (AD 600–1600), and Historic (AD 1600 to present). Although these divisions represent convenient temporal categories, they are also based in large part on perceived adaptations in subsistence and are reflected in changes in lithic and other technologies.

Paleoindian (prior to 8800 BP)

Scholars divide the Paleoindian period in North America by geological epochs. Pleistocene era peoples that inhabited North America from ca. 12,000–10,000 BP are referred to as Early Paleoindian with the advent of the Holocene as the arbitrary temporal demarcation between Early and Late Paleoindian periods (Collins 2004). The people of the Late Paleoindian period (10,000–8800 BP) utilized a similar lanceolate point technology and practiced lifestyles that were in many ways the same as the Early Paleoindian period. Diagnostic artifacts for the Early Paleoindian period include lanceolate-shaped, fluted projectile points such as Clovis, Folsom, and Plainview. Early projectile points were utilized as tips on atlatls and spears and were used in the hunting of big game such as mammoth, mastodon, bison, horse and camel (Black 1989). The shift from the Early to the Late Paleoindian subperiod is marked by the appearance of several unfluted projectile point styles such as the Dalton and San Patrice types and "Plainview like" points that are similar to Plainview points but differ in flaking technology and are noticeably thicker through the midsection (Collins 2004). The appearance of Golondrina-Barber and Saint Mary's Hall point types postdate Dalton and San Patrice types (Collins 2004). Along with chipped stone artifact assemblages characterized by Clovis and Folsom points, artifact assemblages for Early Paleoindian peoples in Central Texas include engraved stones, exotic

lithic materials such as obsidian, and ochre stained artifacts. During the Paleoindian period, a hunter-gatherer adaptation strategy was employed with an increase in the harvesting of flora and in the hunting of small game as big game died off towards the end of the Pleistocene.

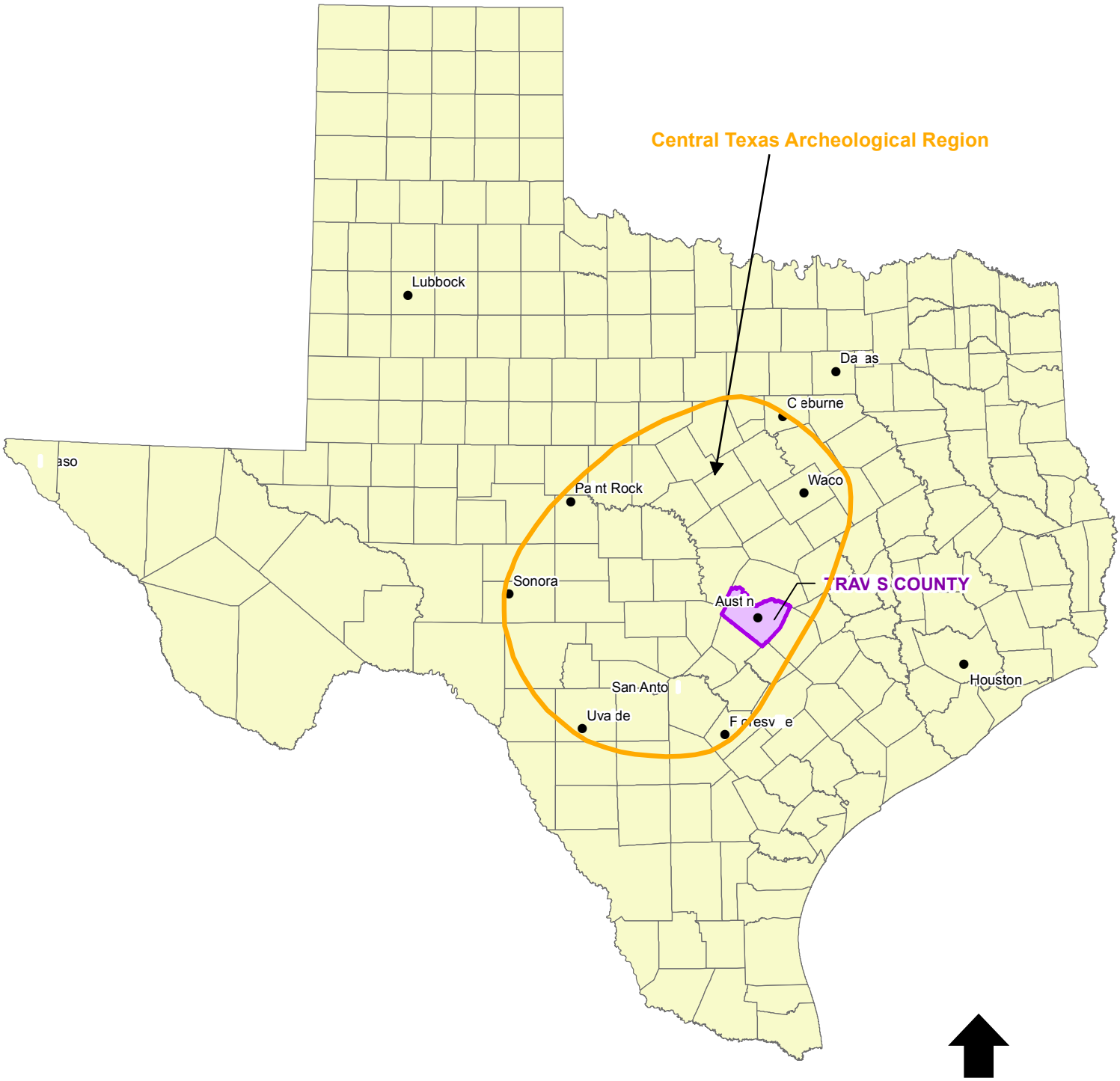
The Early Paleoindian cultures in South and Central Texas are believed to be associated with the well-known big game hunting tradition of the Great Plains (Hester 1989). Most of the well-documented Early Paleoindian sites in Texas that are associated with extinct megafauna are located north and west of Central Texas on the Llano Estacado and adjacent areas of the Southern High Plains. In general, Early Paleoindian sites are scarce in Central Texas, or at least less visible than later sites. Conversely, Late Paleoindian sites are much more numerous in South and Central Texas, although both are usually identified from only surface-collected artifacts (Black and McGraw 1985). Subsistence data from several Late Paleoindian sites does suggest, however, that small game was exploited in addition to extinct megafauna. This data supports the idea that a hunting and gathering lifestyle may have already been adopted across much of Southwest and Central Texas prior to the Early Archaic period.

Paleoindian occupations in Central Texas have typically been associated with lanceolate projectile points such as Clovis, Folsom, Plainview, Golondrina, and Meserve and stemmed points such as Scottsbluff (Turner and Hester 1993). Recent investigations at the Wilson Leonard Site (41WM235) equate three styles of projectile points, Golondrina/Barber, St. Mary's Hall and Wilson, to the late Paleoindian period (Collins 2004). The Wilson component is dated at 10,000 to 9650 BP and is associated with features, artifacts, and a burial that are more Archaic-like in nature than Paleoindian (Collins 2004). The data from this site further suggests that the Archaic nature of the adaptation continues during the ensuing Golondrina/Barber and St. Mary's Hall components. These are dated between 9500 and 8800 BP and may represent a transitional period between the Paleoindian and the Archaic.

Early Archaic (ca. 8800–6000 BP)

Dating from approximately 8800 to 6000 BP, the Early Archaic period is subdivided into three projectile point style intervals: Angostura, Early Split Stem and Martindale/Uvalde, from 8800 to 6000 BP (Collins 2004). Generally, the shift from Paleoindian to Archaic subsistence strategies is measured by a change in technology focused on the use of burned rocks to process geophyte plant foods. This shift is traced back as early as 8800 BP at the Wilson-Leonard Site and at roughly comparable ages at several other Central Texas sites. At these locales, evidence for the use of earth ovens and burned rock technologies for processing plant foods is associated with lanceolate Angostura projectile points. Hence, the use of Angostura and late Paleoindian lithic technologies may have continued on into the Early Archaic period for a time but was gradually replaced by the bifurcate base split-stem and Martindale/Uvalde styles.

The Early Archaic period marks a shift to the use of burned limestone and other rocks in the form of scatters, hearths, middens and other features for the heated processing of plant foods. This represents the start of a long-lived Archaic cooking tradition, lasting from roughly 8800 to 1400 BP. This tradition was characterized by the repeated utilization of earth ovens and the resulting creation of burned rock middens at strategic places on the landscape. These new subsistence practices began with a distinctive cooking technology using layered arrangements of



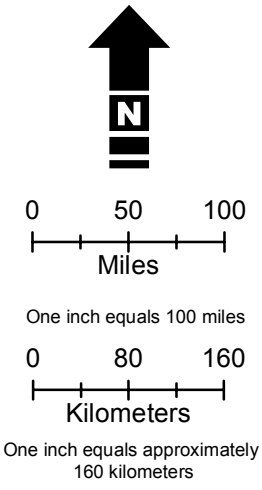


Figure 3

Central Texas Archeological Region

Montopolis Water Reuse Site

heated rocks in earth ovens, allowing for exploitation of a broad range of geophytes. These included upland xerophytic plants like sotol and other species such as Lily family onion bulbs, which grow in wetter environments.

Some of the most recent climatic reconstructions for the period note a moist and cool late Pleistocene environment with early to mid-Holocene shifts to drier conditions that became most pronounced during the mid-Holocene (ca. 5000–7000 BP, Ricklis and Collins 1994). In contrast, Johnson (1995) suggests that the relatively mesic conditions of the eastern Edwards Plateau during the Pleistocene and early Holocene/Paleoindian period underwent a brief dry interval during Late Paleoindian times, later returning to more mesic conditions during the ensuing Early Archaic period (roughly 8000–5800 BP). Whether the Early Archaic climate reflects a gradual drying period (Ricklis and Collins 1994) or a more mesic interval within an overall, long-lived trend toward aridity along the eastern Edwards Plateau, it appears that the use of burned rock midden technologies for plant food and other types of subsistence related processing began during this period and continued for many thousands of years.

Overall, the bulk of the Central Texas archaeological literature suggests that the Early Archaic occupations were generally small, widely distributed, and non-specialized (Black and McGraw 1985). Explanations for these characteristics support a generalized hunting-gathering strategy involving relatively high group mobility, poorly defined territories, and short-term occupations. Hence, broad spectrum, well-adapted, highly mobile subsistence strategies are theorized.

Middle Archaic (ca. 6000–4000 BP)

The Middle Archaic marks an intensification of the use of burned rock technologies to process plants and other types of foods within an increasingly arid environment. Ricklis and Collins (1994) recognize a pronounced mid-Holocene drying event from 7000 to 5000 BP, though it may have lasted longer. Johnson (1995) posits the occurrence of a dry Edwards Interval along the eastern Edwards Plateau from roughly 5500 to 1400 BP. Evidence for this is seen in the cessation of significant overbank sediment aggradation at a number of Central Texas sites. Instead of deposition, arid conditions catalyzed extensive downcutting and erosion along many Central Texas streams. Hypothetically, dry conditions would have promoted the spread of desert succulent xerophytic plants and fostered the increased use of burned rock middens. Drier conditions may also have engendered the return of bison in great numbers to the plateau during the Middle and Late Archaic periods. Furthermore, the proliferation of Bell/Andice/Calf Creek projectile point styles at the beginning of the Middle Archaic may have coincided with the return of bison to the Edwards Plateau and the adjacent Blackland Prairies; these broad bladed points have been associated with the exploitation of bison within archaeological literature. Additional Middle Archaic projectile point styles include Early Triangular, La Jita, Nolan, and Travis.

Late Archaic (ca. 4000–1400 BP)

Recent refinements in the Central Texas chronology divide the Late Archaic interval into two different subperiods (Johnson 1995). Subperiod I is marked by the appearance of Bulverde projectile points, which along with later forms (Pedernales, Castroville, Marshall and Montell) were used to hunt bison and other large game. Burned rock middens continued to proliferate

during the Late Archaic I interval. The resources processed via burned rock technology may have included yucca, sotol, and perhaps agave lechuguilla. Other middens may simply be dumps for kitchen-type debris, which contain sizeable quantities of animal bones, broken stone tools, and flint-knapping detritus (Johnson 1995). Peoples associated with the Pedernales style interval, in particular, may have been adept at both hunting and the processing of large volumes of plant food materials.

The Late Archaic II interval (ca. 600 BC–AD 600) likely was a time of increasingly mesic conditions for all but the western and southwestern portions of the Edwards Plateau (Johnson 1995). The onset of more mesic conditions may have resulted in decreased numbers of upland xerophytic plants and perhaps bison (Johnson 1995), which may have forced adjustments in prehistoric subsistence strategies. There appears to be a decrease in the number of burned rock middens that can be directly attributable to the Late Archaic II interval. The projectile points used at this time are smaller and are characterized by such styles as Ensor, Fairland, Frio and Darl. Evidence suggests the large projectiles well-adapted to bison hunting may have been gradually replaced. In addition, it has been posited that the spread of Eastern Woodland belief systems may have had an influence on the Late Archaic II peoples of Central Texas (Johnson 1995).

Late Prehistoric (ca. AD 600–1600)

For Central Texas, the period of transition from the long Archaic period to what Collins (2004) labels the "Late Prehistoric" is one mired in ambiguity. Cultural traits that prevailed in other regions of Texas, such as the adoption of the bow and arrow, the use of pottery, and the practice of agriculture, were expected to reveal themselves, with time, in the Central Texas archaeological record (Suhm et al. 1954). In anticipation of these findings, early scholars had adopted the term "Neo-American" to describe post-Archaic life-ways. Others, recognizing the anomalous continuation of a basic hunting and gathering subsistence strategy, coined terms such as "Neo-Archaic" (Prewitt 1981) and "Post-Archaic' (Johnson and Goode 1994). Bow and arrow technology appears to have indeed been adapted ca. 1200 BP (Collins 2004). Pottery is too utilized, but much later and is not as widespread as is seen in other regions of Texas. Evidence for agriculture for the area is minimal and, by all accounts, comes into use comparably late.

Johnson and Goode (1994) write that the Sabinal and Edwards arrowheads may have been the first arrowhead styles to appear on the eastern Edwards Plateau at about 1200 BP. This date is slightly more recent than the earliest accepted dates, ca. 1450 BP, for the advent of bow technology in eastern North America, although Odell (1988) argues that flakes and bifaces were utilized as arrow points during the Archaic period. It is widely believed that the bow and arrow entered into eastern North America from an arctic source (Shott 1997). Reasons for the adoption of this new technology are still being examined, with conventional assumptions that regarded the bow as being more efficient for hunting now being questioned (Larralde 1990). Within Central Texas, there appears to be a correlation of Edwards, and, later, Scallorn type arrowheads with conflict and warfare (Johnson and Goode 1994).

Austin Phase

While recognizing that a predominantly Archaic lifestyle persisted for Central Texas for far longer than neighboring regions, Collins (2004), like Jelks (1962) before him, organizes the Late Prehistoric into two subperiods. These subperiods correspond with the Austin and Toyah intervals that are distinguished by changes in projectile point styles. The Austin subperiod, or interval, is dated from ~1200 BP to 650 BP by Collins (2004). Associated with this subperiod are Scallorn and Edwards point types. Save for the adoption of bow technology, the material culture associated with the Austin subperiod is similar to that of the Late Archaic (Johnson and Goode 1994). As representative of such assemblages, Prewitt (1981:83) lists Clear Fork gouges, scrapers, small concave unifaces, grinding and hammer stones, bone awls, marine shell beads, and pendants. Johnson and Goode (1994) add that bifacial flint knives, although usually smaller than those with Archaic associations, are also commonly found.

Subsistence practices also seem to be very similar to those practiced during the Late Archaic. Regarding resource exploitation, Prewitt (1981:74) states that the "emphasis seems to be on gathering a balanced variety of plant foods rather than on hunting, although a slight increase occurs in the overall importance of hunting". Burned rock middens have been dated to the Austin subperiod, though these seem to occur with a good deal less frequency than preceding periods (Goode 1991; Houk and Lohse 1993). During the Austin subperiod, there is marked widespread appearance of "true" cemeteries, a trend that carries over into the following Toyah subperiod (Prewitt 1981).

Toyah Interval

Both Collins (2004) and Johnson and Goode (1994) tentatively date the Toyah interval from ~ 650 BP to 200 BP. This time period is one of the better documented and understood of the prehistoric culture-historical time periods within and adjacent to Central Texas. This is because there are large numbers of well-documented Toyah sites, many of which are short lived, isolated occupations (Black 1986; Johnson 1994; Karbula 2003; Quigg and Peck 1995; Ricklis and Collins 1994). During the Toyah interval, the climate continued trending towards the mesic norms prevalent today and buffalo were returning to the area in numbers (Johnson and Goode 1994). In consort, Toyah subsistence aligns toward bison procurement and there is an increased emphasis on hunting compared to the Austin subperiod (Prewitt 1981).

Toyah has been variably described as an interval, a phase, and a horizon (University of Texas at Austin 2011). While the ascribed labels may vary, the intent seems to be the same: to identify a distinct cultural expression that abruptly appears across the Edwards Plateau, Rio Grande Plains, and the Lower Pecos. Largely this identification is based on two sets of unique material remains that appear in the Central Texas archaeological record during the 14th Century: a unique toolkit and earthenware pottery. It has been noted that technical and stylistic changes from the Austin phase to the Toyah phase was more pronounced than between the Late Archaic and Prehistoric periods.

Although not restricted to Toyah, perhaps the most recognized element of the Toyah stone toolkit is the Perdiz Point. In addition to the ubiquitous Perdiz point, the Toyah phase lithic

assemblages include Clifton points and a variety of flaked tools oriented towards bison processing (Karbula 2003). Directly percussed flake blades are found in Toyah assemblages and represent a blade technology that was absent during the preceding Archaic (Johnson and Goode 1994). Other hallmarks of this time are sandstone abraders, beveled-edged Harahey and Covington knives, gravers, small drills often fashioned from small flakes, stone side scrapers, deer bone spatulates, grass basketry/mats, mussel shell pendants, bone awls and beads.

While there has been pottery found in association with sites that are pre-Toyah, it is during this period that ceramics first appear in the Central Texas archaeological record in numbers. Locally manufactured ceramic-types are known as Leon Plain, a bone tempered plainware and Doss Redware with slips that were decorated with red ochre. Occasionally, these vessels exhibit incised decorations, beveled rims, and an application of a fine wash to their interiors (Johnson 1994). In addition to these styles, ceramics were acquired from the Eastern Woodlands (Collins 2004). Occasionally, asphaltum-coated sherds are found and are likely intrusions from the Texas Gulf Coast tradition of the Karankawans. Within the archaeological record, most of the remnants of Toyah age pottery are fragmented potsherds, a consequence of weathering the low-firing technique of Toyah ceramic manufacture. When reconstruction of vessels has been possible, most appear to be utilitarian water jugs and simple bowls.

Johnson (1994) documents that most of the lithic tools found in Toyah assemblages were fabricated from either flakes or blades, although, bifacial reduction was, on occasion, also utilized. The fabrication of pointed-stem, barbed arrowheads from flint blades was new to Central Texas (Johnson 1994, Tunnell 1989). These points typically began as small blades, some as small as 7 centimeters in length extracted from block or rounded nodules. Sub-cubical shapes make ideal blade cores because they already have flat surfaces for striking platforms. After an initial flake detachment, a series of blades can be detached by rotating the core to access fresh platforms (Johnson 1994). Generally, the detached blades would be thicker along its longitudinal axis with extremely thin lateral edges. In order to prepare this preform for pressure flaking, the lateral edges were abruptly retouched. Johnson (1994) notes that previously identified Cliffton points were in actuality Perdiz preforms.

Studies suggest that bison presence in Central Texas reached its height during the Late Prehistoric (McDonald 1981). Across North America, this increase in bison numbers is often correlated with the “Little Ice Age” which brought in wetter conditions that brought about widespread vegetative growth (McDonald 1981). Within Texas, the Blackland Prairie with its high density of grasses such as little bluestem, Indian grass, buffalo grass and switch grass would have served the bison well, while the forested Post Oak may also have been a suitable habitat, particularly for *Bison athabascae*. Robust and wide-ranging, bison likely moved throughout the Central Texas region exploiting ecotones just as humans did.

The Late Prehistoric or Post-Archaic (ca. AD 600–1600) (Johnson 1995) in Central Texas is initially marked by the replacement of the dart and atlatl with the bow and arrow, as reflected in the shift from dart points to smaller, thinner and lighter arrow points (Ricklis and Collins 1994). Despite the shift to the bow and arrow, there is strong indication that the broad based hunting-gathering economy of the Late Archaic persisted into and throughout most of the Late Prehistoric period. The latter part of this period is marked by the appearance of pottery and a distinctive

complex of tools composed of contracting-stem Perdiz arrow points, an abundance of unifacial end scrapers, thin, alternately beveled bifacial knives, and drills or perforators made of flakes and blades. Evidence suggests that after the Late Archaic, the climate again turned dry and somewhat arid toward the middle of the Late Prehistoric, during which a dramatic increase in bison exploitation suggests it became an increasingly important economic activity during the later part of this period.

Historic Period (AD 1528–Present)

The most radical changes in the Native American history of Central Texas came during the historic era (Black 1989). The horse was introduced into North America by Spanish settlers in the sixteenth century; nomadic groups, initially the Apaches and later the Comanches, adopted the horse and rapidly altered the aboriginal situation of Central Texas. These nomadic groups entered Central Texas from the plains and mountains to the north and west and within 150 years had forced most of the native peoples to flee. Most groups were destroyed by the combined effects of the nomadic raiders and the foreign diseases later introduced by Europeans. Others moved south, entering Spanish missions and settlements, or eastward to join various agricultural groups such as the Wichita (Black 1989).

The historic period in Texas begins with the arrival of Alvar Nunez Cabeza de Vaca and other survivors of the Navarez expedition on the Texas coast in 1528, although there may have been earlier landings. In any case, the influences of European colonization were not felt strongly in Texas until several centuries later. By the middle of the eighteenth century, though, the Spanish had established missions in East Texas and settlements in South Texas. This resulted in massive depopulation and cultural disintegration among Native American groups.

Anglo settlement in Central Texas began in the early 1820s when Stephen F. Austin received permission from the government of Mexico to settle 300 families in the coastal plain between the San Antonio and Brazos Rivers (Barker 2011). By the early 1830s a series of small forts had been established to defend against the Comanche Indians, on whose land these new settlers resided. The line of forts extended for almost 30 miles from northwest of Bastrop to just east of Austin and included Bastrop, Wilbarger's Bend, Coleman's Fort, Webber's Fort, Gilleland Creek, Fort Colorado, and Fort Prairie, and passed through the general vicinity of the Onion Creek Greenway project area (Smyrl 2011). The Greenway project area is surrounded by several historic settlements: Del Valle (established in the 1870s) to the west, Garfield (established around 1880) to the east, and Hornsby Bend (settled in the 1830s and said to be the county's earliest settlement) to the north, across the Colorado River. Most of these communities reached their peak population around the turn of the twentieth century; the construction of a rail line connecting Houston to Austin in the 1870s gradually led to a decline of the communities bypassed by the railroad.

Previous Investigations and Recorded Archeological Sites

According to the THC Online Sites Atlas (the Atlas) accessed on May 1, 2013, there have been no previous archeological surveys within the proposed project area (**Figure 4**). The nearest recorded survey, located adjacent to the proposed project's western terminus, is an unnamed

survey of the Montopolis Road alignment. Other surveys documented within one kilometer of the proposed project include a linear survey conducted on behalf of the State Department of Highways and Public Transportation in 1986 and an areal survey conducted by the Lower Colorado River Authority (LCRA) in 2001 under Texas Antiquities Permit #2537. During this survey, Site 41TV1951 was recorded. Located adjacent to a previously undocumented spring, this prehistoric site is described by Prikryl as one of "two of the most significant prehistoric cultural resource sites discovered in recent years during LCRA surveys" (THC 2013). Additionally, although no details of its components are available on the Atlas, archeological Site 41TV1697 is located approximately 720 meters southeast of the proposed project location.

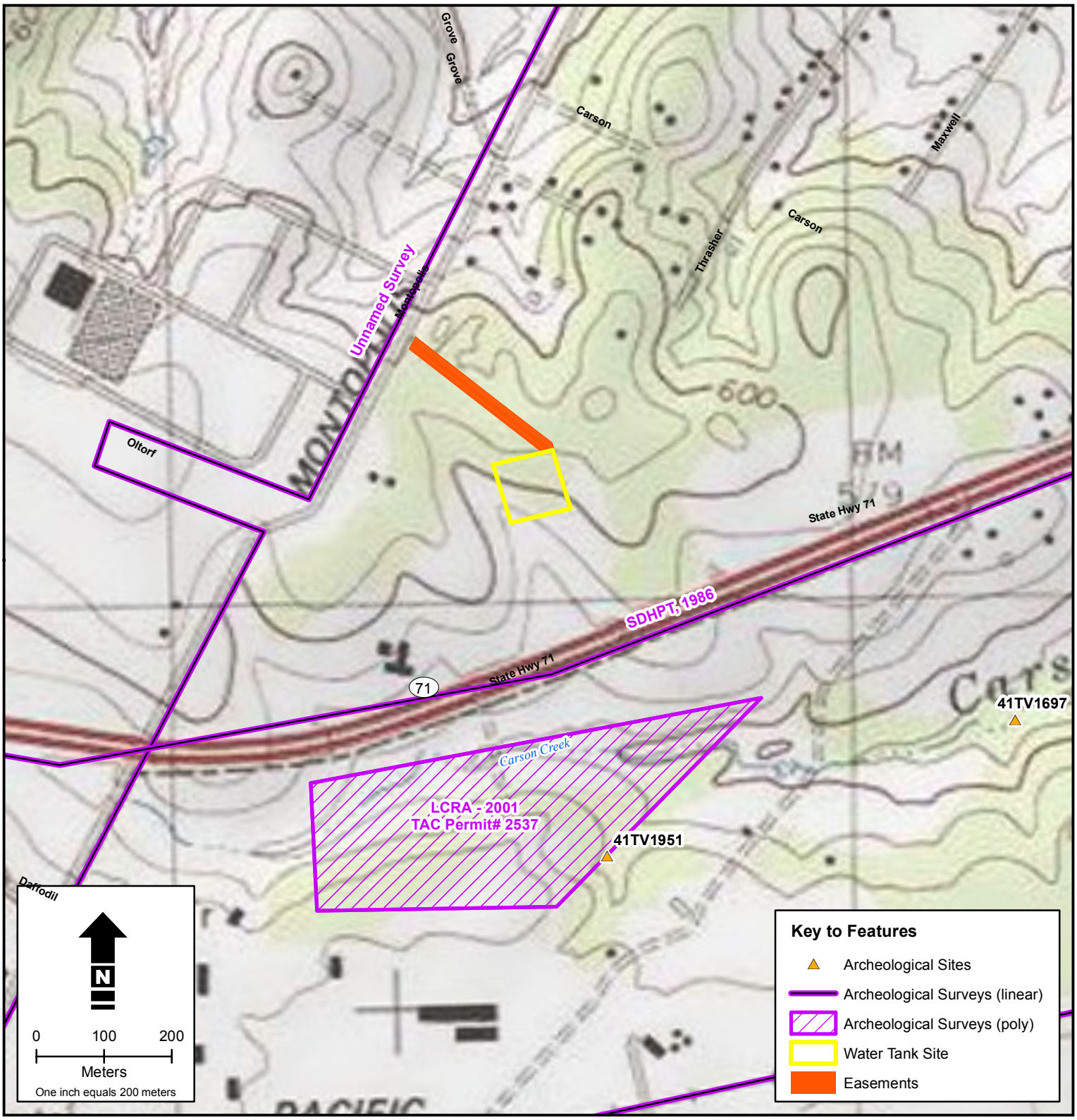
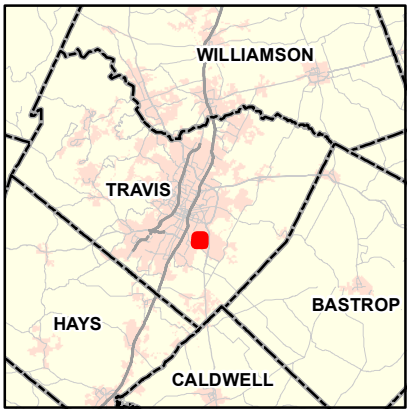


Figure 4

Previous Recorded Archeological Sites and Surveys

Montopolis Water Reuse Site

USGS 7.5-minute Topographic Quadrangle: Montopolis, TX



METHODOLOGY

Since the proposed project overlays geological formations that predate the arrival of humans in the Americas, it was determined that cultural deposits within the proposed project area would likely be close to the surface in overlying sediment or on the surface itself. Therefore, Hicks & Company proposed that pedestrian survey supplemented with shovel testing as an adequate methodology to assess the proposed project's potential to impact undocumented archeological resources and/or sites. The field methodology utilized in the course of the archaeological survey was tailored to provide the broadest possible evaluation of cultural resources within the project area.

Hicks & Company archaeologists conducted a 100-percent intensive survey of the project area following the THC/CTA's minimum survey standards for areal projects of less than 10 acres in size. All shovel tests were terminated at bedrock, dense clays or clay loams within a cobble matrix. All excavated soil from shovel tests was screened through quarter-inch wire mesh or hand-sorted when clays would not pass through screens. Each shovel test was recorded in ten-centimeter levels on standardized forms and their location plotted using a GPS. Once data were recorded, all shovel tests were backfilled.

With an absence of below-surface cultural deposits (two shovel tests placed within the site boundary were negative), newly recorded Site 41TV490 was delineated by the extent of the present surficial lithic scatter observed within and adjacent to the proposed project area.

Investigators used handheld GPS units and detailed maps to locate and record excavations within the proposed project area. GPS positions were recorded for all shovel tests. All GPS positions were downloaded and plotted on 7.5-minute USGS topographic and aerial maps by Hicks & Company GIS personnel.

RESULTS OF FIELD INVESTIGATIONS

Survey of the proposed project area initiated immediately east of Montopolis road, where the proposed water line/access road segment will tie into an existing water line. From this location, the proposed waterline/access road alignment runs southeast for 280 meters through densely wooded terrain, terminating at the northeast corner of the proposed water tank site location (**Figures 5 & Appendix B**). Three of the four shovel tests (JH1, GC1, and GC2) conducted along this segment noted sandy loams that ranged from brown (10YR 3/3) to dark yellowish brown (10YR 4/6) in color with high amounts of limestone gravel and calcium carbonate precipitate inclusions. These shovel tests terminated from 15-25 cmbs at hard clay or gravel bed matrices. Shovel test JH2 conducted at the water line/access road's termination at the northeast corner of the proposed water tank site location noted a black (10YR 2/1) humic loam with approximately 20 percent limestone cobble inclusions. This test terminated at 20 cmbs at bedrock.

The water tank site's proposed location is a square shaped area, 90 meters x 90 meters or approximately two acres in size, bounded on the south side by an existing gas pipeline right of way (**Appendix B**). Vegetation of the area is similar to that observed within and along the proposed waterline/access road corridor, with dense cedar and a low understory that gives way to patchy cedar and oak stands and intermittent exposures of chert and limestone cobbles (**Figures 6 and 7**). The proposed water tank location is home to a number of homeless encampments and is littered sporadically with debris and accumulated garbage (**Figures 8 and 9**). Five shovel tests (GC3, GC4, JH3-JH5) were excavated at the proposed water tank location. Shovel tests conducted at the center (GC4) and the northern extent (GC3 and JH5) of this tract noted silty clay loams and sandy loams that ranged from brown (10YR 4/3) to dark yellowish brown (10YR 4/6) in color. These tests terminated from 10-28 cmbs at thick dark brown (10YR 3/3) clays or at bedrock. Shovel tests (JH3 and JH4) excavated within the southern half of the proposed water tank area noted deeper clay loams that ranged from very dark gray (10YR 3/1) to black (10YR 2/1) in color terminating between 40-45 cmbs at thick impenetrable clays. None of the shovel tests excavated during the investigation were positive for cultural materials. A single site, Site 41TV2438, was recorded during the survey and is described in more detail below.

Figure 5: Overview of the proposed waterline/access road corridor facing southeast from Shovel Test JH1.

Figure 6: Overview of proposed water tank location facing southeast from Shovel Test JH2.

Figure 7: Limestone and chert cobble exposure, eroding from the thin soils.

Figure 8: Homeless encampment typical of the immediate area.

Figure 9: Modern trash scatter noted near southwest corner of proposed water tank location.

Site 41TV2438

During survey of the northeastern portion of the proposed water tank location, a small (40 meters x 20 meters) prehistoric surficial lithic scatter was encountered and recorded as Site 41TV2438 (**Appendix B**). This site is located on a slight, southeast trending, slope immediately west of an ephemeral drainage. The area is vegetated with cedars and, within the vicinity there are exposures of chert cobbles (**Figures 10 and 11**). Site 41TV2438 consists of a bifacial core, 2-3 multidirectional cores, 2-3 tested cobbles, and small amounts of debitage (**Figures 12 and 13**). Based on the artifact assemblage it is likely that this site represents short term use centered on the procurement of raw material. Shovel tests (GC3 and JH5) conducted at Site 41TV2438 were negative and no buried cultural deposits or features were noted. Due to a lack of chronological or cultural diagnostics, the lack of datable components that would add valuable data to the archaeological record, and a small assemblage size that is very typical of the area, Site 41TV2438 is recommended as ineligible for listing as a State Archaeological Landmark (SAL).

Figure 10: Overview of Site 41TV2438 facing west from eastern boundary.

Figure 11: Overview of Site 41TV2438 facing southeast from northern boundary.

Figure 12: Bifacial core or tool observed on surface of Site 41TV2438.

Figure 13: Multidirectional core observed on surface of Site 41TV2438.

CONCLUSIONS AND RECOMMENDATIONS

Pedestrian survey and shovel testing of the proposed Montopolis Water Reuse Site project in Travis County, Texas, revealed a single prehistoric archeological site of unknown temporal period with no features, and small amounts of observable materials. This site was recorded as 41TV2438. Due to a lack of chronological or cultural diagnostics, the lack of datable components that would add valuable data to the archaeological record, and a small assemblage size that is very typical of the area, Site 41TV2438 is recommended as ineligible for listing as a SAL according to criteria listed in 13 RAC 26.8 and 13 TAC 26.12. Based on the results of the current survey, it is recommended that no SALs will be affected by the proposed project and that the project can proceed to construction with no further archeological investigations. In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease and THC archeological staff will be contacted. Hicks & Company offers this draft report in partial fulfillment of TAC Permit #6565. No cultural materials were collected during the survey. All project-related notes will be permanently curated at the Texas Archeological Research Laboratory in Austin, Texas.

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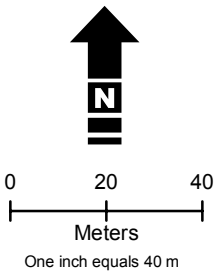
APPENDIX A

SHOVEL TEST RESULTS

Table A-1 Shovel Tests Results					
Shovel Test	**Location**	**Surface Visibility**	**Depth (cmbs)**	**Description**	**Cultural Materials**
GC1	Southwest edge of easement 40 meters south of Montopolis	50%	25	**0-20 cmbs** Brown (10YR 4/3) silty sandy loam with large limestone inclusions. **20-25 cmbs** Dark brown (10YR 3/3) hard clay with calcium carbonate.	**None**
GC2	Southwestern edge midway of easement	20%	24	**0-21 cmbs** Brown (10YR 4/3) silty clay loam with large limestone inclusions. **21-24 cmbs** Dark brown 10YR 3/3 hard silty clay with calcium carbonate inclusions.	**None**
GC3	Northwest corner of Tank site north of surface finds	10%	28	**0-25 cmbs** Brown (10YR 4/3) silty clay loam with lesser amounts of limestone inclusions. **25-28 cmbs** Yellow (10YR 8/6) hard clay silts with no inclusions.	**None**
GC4	Western half central section of tank site near homeless dwelling, gently rising	10%	15	**0-10 cmbs** Hard brown (10YR 4/3) silty clays with many limestone inclusions **10-14 cmbs** Harder dark brown (10YR 3/3) clay with few inclusions.	**None**
JH1	Cedar thicket 35 meters southwest of Montopolis, uplands	15%	15	**0-15 cmbs** Dark yellowish brown (10YR 4/6) sandy loam within a limestone gravel matrix (70%). Terminated within gravel bed.	**None**
JH2	At northeast corner of tank location. Cedar thicket with heavy leaf litter	5%	20	**0-20 cmbs** Black (10YR 2/1) humic loam w approx. 20% limestone cobble inclusions. Terminated at bedrock.	**None**
JH3	Southeast corner of tank location, approx. 1 meter north of maintained underground pipeline corridor	5%	40	**0-40 cmbs** Black (10YR 2/1) clay loam with impenetrable clay at 40 cmbs.	**None**
JH4	Southwest corner of Tank site	80%	45	**0-35 cmbs** Very dark gray (10YR 3/1) clay loam w/ increasing mottles of light yellowish brown (10YR 6/4) clay.	**None**
JH5	Very west extent of Site 41TV2348	75%	10	**0-10 cmbs** Dark yellowish brown (10YR 4/6) sandy loam with chert and limestone gravels. Terminated at bedrock.	

APPENDIX B

LOCATIONS OF SHOVEL TESTS AND SITE 41TV2438



Appendix B

Shovel Tests and Site 41TV2438 Location
Montopolis Water Reuse Site

Key to Features

- Shovel Tests
- Surface Artifacts
- Isolated Finds
- Site 41TV2438
- Water Tank Site
- Easements