Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Zak Covar, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 17, 2014

RECEIVED
NOV 25 2014
COUNTY ENGINEER

Mr. Carl Barnes
Pedernales Electric Cooperative, Inc.
201 South Avenue F
Johnson City, Texas 78636

Re: Edwards Aquifer, Comal County

NAME OF PROJECT: Purgatory Road Substation; Located approximately 0.70 miles northeast of the Purgatory Road and FM 306 intersection; Comal County, Texas

TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Investigation No. 1196007; Regulated Entity No. RN107715732; Additional ID No. 13-14090901

Dear Mr. Barnes:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP Application for the above-referenced project submitted to the San Antonio Regional Office by AMEC Environment & Infrastructure, Inc. on behalf of Pedernales Electric Cooperative, Inc. on September 9, 2014. Final review of the WPAP was completed after additional material was received on November 07, 2014. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) were selected and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed commercial project will have an area of approximately 5.06 acres. It will include the installation of an electrical utility substation. The impervious cover will be 2.05 acres (40.5 percent). No wastewater will be generated by this project.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, one partial sedimentation/filtration basin, and two 15 foot engineered vegetative filter strips (VFS), designed using the TCEQ technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices (2005), will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 1,840 pounds of TSS generated from the 2.05 acres of impervious cover. The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

The partial sedimentation/filtration basin will have a clay liner and be designed with a 4 inch perforated PVC underdrain system that will be covered with a 6 inch gravel layer. Geotextile fabric will be placed over the gravel layer and topped with 18 inches of sand (ASTM C-33 compliant). The basin will be designed with a water quality volume of 17,277 cubic feet (16,904 cubic feet required), and a sand filter area of 1,440 square feet (1,408 square feet required). The basin is designed to remove 1,760 pounds of TSS.

The two engineered VFSs will extend along the entire length of the contributing area with no gullies, rills or obstructions that will concentrate flow. The VFSs will have a uniform slope of less than 20 percent, and will maintain a vegetated cover of at least 80 percent. VFS #1 is designed to remove 51 pounds of TSS, and VFS #2 is designed to remove 51 pounds of TSS.

Combined, the permanent BMPs are designed to remove 1,862 pounds of annual TSS load (1,840 pounds required).

GEOLOGY

The site is located within the outcrop area of the lower dolomitic member of the Kainer Formation. According to the geologic assessment included with the application 10 features (3 non-karst closed depressions, and 7 natural bedrock features) were identified on the site. None of the identified features were classified as sensitive. The San Antonio Regional Office site assessment conducted on November 3, 2014 revealed the site was generally as described in the geologic report.

SPECIAL CONDITIONS

I. All permanent pollution abatement measures shall be operational prior to use of the facility.

II. All sediment and/or media removed from the water quality basin during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.
2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the approved plan. Additional and separate approvals, permits, registrations and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, UIC) can be required depending on the specifics of the plan.

3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. Within 60 days of receiving written approval of an Edwards Aquifer Protection Plan, the applicant must submit to the San Antonio Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.
5. All contractors conducting regulated activities at the referenced project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.
6. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.
7. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.
8. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.
9. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

During Construction:

10. During the course of regulated activities related to this project, the applicant or agent shall comply with all applicable provisions of 30 TAC Chapter 213, Edwards Aquifer. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity.

11. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 6, above.
12. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the San Antonio Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.
13. No wells exist on site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.
14. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.
15. Intentional discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge will be filtered through appropriately selected best management practices. These may include vegetated filter strips, sediment traps, rock berms, silt fence rings, etc.
16. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.
17. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

<u>After Completion of Construction:</u>

18. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the San Antonio Regional Office within 30 days of site completion.
19. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through San Antonio

Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

20. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.
21. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.
22. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Mr. Alex Grant of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210-403-4035

Sincerely,

Lynn Bumguardner, Water Section Manager
San Antonio Region Office
Texas Commission on Environmental Quality

LB/AG/eg

Enclosures: Deed Recordation Affidavit, Form TCEQ-0625
Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

cc: Mr. Brock Langley, P.E., AMEC Environmental & Infrastructure, Inc.
Mr. Tom Hornseth, P.E., Comal County
Mr. Roland Ruiz, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 21

Bryan W. Shaw, Ph.D., *Chairman*
Toby Baker, *Commissioner*
Zak Covar, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

RECEIVED
SEP 18 2014
COUNTY ENGINEER

September 11, 2014

Mr. Thomas H. Hornseth, P.E.
Comal County Engineer
195 David Jonas Drive
New Braunfels TX 78132-3710

Re: Edwards Aquifer, Comal County
PROJECT NAME: Purgatory Road Substation, located approximately 0.70 miles northeast of the Purgatory Road and FM 306 intersection, New Braunfels, Texas

PLAN TYPE: Application for Approval of Water Pollution Abatement Plan (WPAP) 30 Texas Administration Code (TAC) Chapter 213; Edwards Aquifer Protection Program
EAPP Additional ID: 13-14090901

Dear Mr. Hornseth:

The referenced application is being forwarded to you pursuant to the Edwards Aquifer Rules. The Texas Commission on Environmental Quality (TCEQ) is required by 30 TAC Chapter 213 to provide copies of all applications to affected incorporated cities and underground water conservation districts for their comments prior to TCEQ approval. More information regarding this project may be obtained from the TCEQ Central Registry website at http://www.tceq.state.tx.us/permitting/central_registry/.

Please forward your comments to this office by October 11, 2014.

The Texas Commission on Environmental Quality appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions regarding these matters, please feel free to contact the San Antonio Region Office at (210) 490-3096.

Sincerely

Todd Jones
Water Section Work Leader
San Antonio Regional Office

TJ/eg

TCEQ-R1
SEP 09 2014
SAN ANTONIO

WATER POLLUTION ABATEMENT PLAN

PURGATORY ROAD SUBSTATION

PEDERNALES ELECTRIC COOPERATIVE, INC.

RECEIVED
SEP 18 2014
COUNTY ENGINEER

Prepared for:

Pedernales Electric Cooperative, Inc.
P.O. Box 1
Johnson City, Texas 78636-0001

Prepared by:

AMEC Environment & Infrastructure, Inc.
3520 Executive Center Drive, Ste. 200
Austin, Texas 78731

September 2014

Project No. AU1412

WATER POLLUTION ABATEMENT PLAN

PURGATORY ROAD SUBSTATION

PEDERNALES ELECTRIC COOPERATIVE, INC.

Prepared for:

Pedernales Electric Cooperative, Inc.
P.O. Box 1
Johnson City, Texas 78636-0001

RECEIVED
SEP 18 2014
COUNTY ENGINEER

Prepared by:

AMEC Environment & Infrastructure, Inc.
3520 Executive Center Drive, Ste. 200
Austin, Texas 78731

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER

R. Brock Langley
9/3/2014

September 2014

Project No. AU1412

Table of Contents

Form 0587

General Information

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SEP 18 2014
COUNTY ENGINEER

General Information Form
For Regulated Activities on the
Edwards Aquifer Recharge and Transition Zones
and Relating to 30 TAC §213.4(b) & §213.5(b)(2)(A), (B)
Effective June 1, 1999

REGULATED ENTITY NAME: Pedernales Electric Cooperative, Inc. (PEC)
COUNTY: Comal STREAM BASIN: Guadalupe River

EDWARDS AQUIFER: _X RECHARGE ZONE
__ TRANSITION ZONE

PLAN TYPE: _X WPAP __ AST __ EXCEPTION
__ SCS __ UST __ MODIFICATION

CUSTOMER INFORMATION

1. Customer (Applicant):

Contact Person: Carl Barnes
Entity: Pedernales Electric Cooperative, Inc. (PEC)
Mailing Address: 201 South Avenue F
City, State: Johnson City, Texas Zip: 78636
Telephone: 830-385-1440 FAX: 830-868-4744

Agent/Representative (If any):

Contact Person: Brock Langley, P.E.
Entity: AMEC Environment & Infrastructure, Inc.
Mailing Address: 3520 Executive Center Drive, Suite 200
City, State: Austin, Texas Zip: 78731
Telephone: 512-795-0360 FAX: 512-795-8423

2. __ This project is inside the city limits of _____.
__ This project is outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____.
X_ This project is not located within any city's limits or ETJ.

3. The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

The site entrance is located on the west side of Purgatory Road, at the intersection of Purgatory Road and Wegner Road, approximately 0.70 miles northeast of the Purgatory Road/FM 306 split.

4. _X **ATTACHMENT A - ROAD MAP**. A road map showing directions to and the location of the project site is attached at the end of this form.

5. _X **ATTACHMENT B - USGS / EDWARDS RECHARGE ZONE MAP**. A copy of the

official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached behind this sheet. The map(s) should clearly show:

_X_ Project site.
_X_ USGS Quadrangle Name(s).
_X_ Boundaries of the Recharge Zone (and Transition Zone, if applicable).
_X_ Drainage path from the project to the boundary of the Recharge Zone.

6. _X_ Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment. **The TCEQ must be able to inspect the project site or the application will be returned.**

7. _X_ **ATTACHMENT C - PROJECT DESCRIPTION**. Attached at the end of this form is a detailed narrative description of the proposed project.

8. Existing project site conditions are noted below:
__ Existing commercial site
__ Existing industrial site
__ Existing residential site
__ Existing paved and/or unpaved roads
__ Undeveloped (Cleared)
__ Undeveloped (Undisturbed/Uncleared)
_X_ Other: Undeveloped/uncleared except for easement with existing electric power transmission lines and poles

PROHIBITED ACTIVITIES

9. _X_ I am aware that the following activities are prohibited on the **Recharge Zone** and are not proposed for this project:

(1) waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
(2) new feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
(3) land disposal of Class I wastes, as defined in 30 TAC §335.1;
(4) the use of sewage holding tanks as parts of organized collection systems; and
(5) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

10. N/A I am aware that the following activities are prohibited on the **Transition Zone** and are not proposed for this project:

(1) waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);
(2) land disposal of Class I wastes, as defined in 30 TAC §335.1; and
(3) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

ADMINISTRATIVE INFORMATION

11. The fee for the plan(s) is based on:

_X_ For a Water Pollution Abatement Plan and Modifications, the total acreage of the site where regulated activities will occur.

___ For an Organized Sewage Collection System Plans and Modifications, the total linear footage of all collection system lines.

___ For a UST Facility Plan or an AST Facility Plan, the total number of tanks or piping systems.

___ A request for an exception to any substantive portion of the regulations related to the protection of water quality.

___ A request for an extension to a previously approved plan.

12. Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

___ TCEQ cashier

___ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)

_X_ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

13. _X_ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

14. _X_ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **GENERAL INFORMATION FORM** is hereby submitted for TCEQ review. The application was prepared by:

Brock Langley, P.E.
Print Name of Customer/Agent

R. Brock Langley
Signature of Customer/Agent

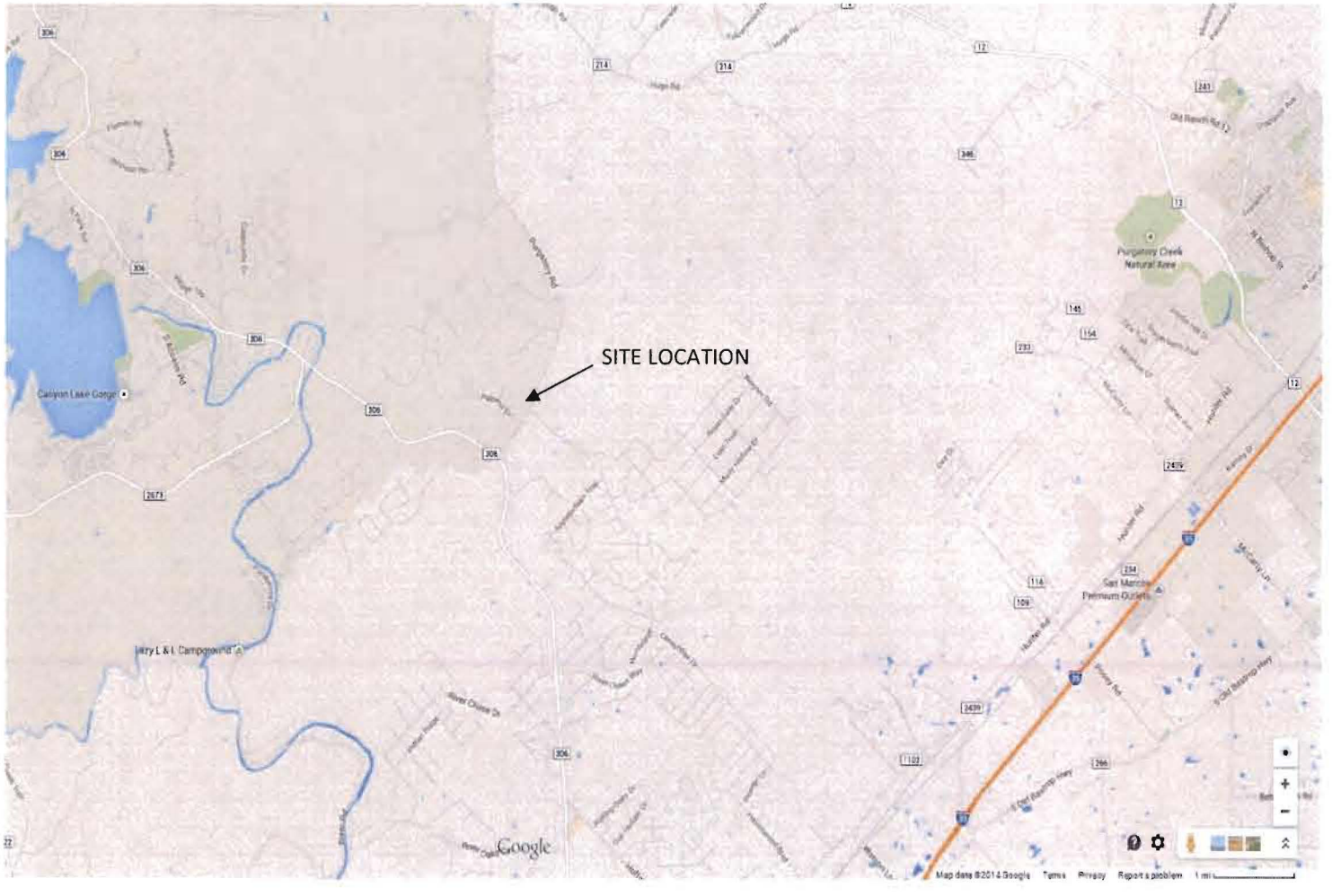
9/8/2014
Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

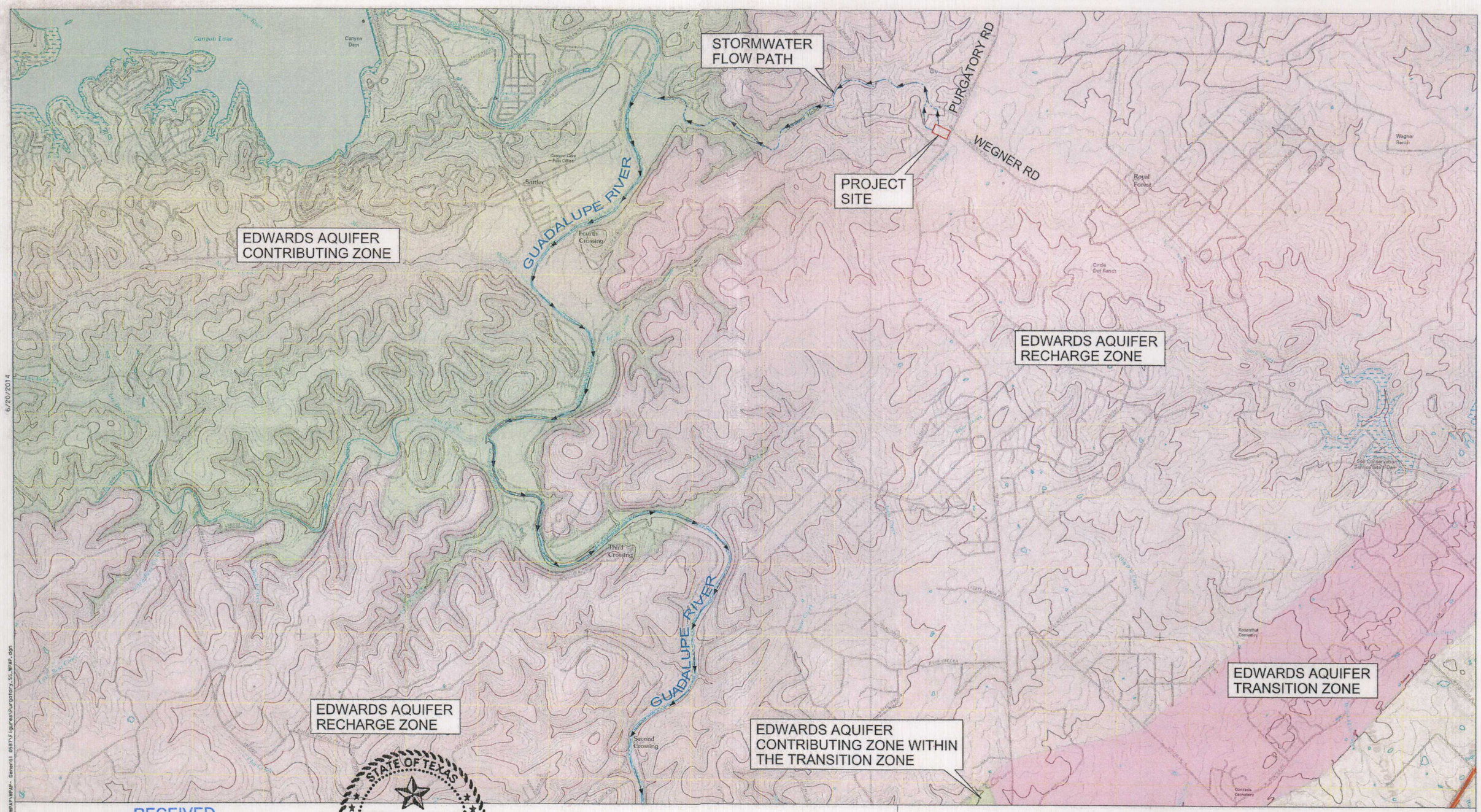
General Information Form 0587
ATTACHMENT A: Road Map
Pedernales Electric Cooperative, Inc. (PEC) – Purgatory Road Substation

General Information Form 0587 - ATTACHMENT A: Road Map



General Information Form 0587
ATTACHMENT B: USGS Edwards Recharge Zone Quadrangle Map
Pedernales Electric Cooperative, Inc. (PEC) – Purgatory Road Substation

ATTACHED



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SEP 18 2014
COUNTY ENGINEER

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER
9/8/14

N

0 500 1000 2000
SCALE IN FEET

Map Source:
USGS 7.5 Min. Quad Sheets Sattler and Hunter, TX 2010

USGS / EDWARDS AQUIFER RECHARGE ZONE MAP

Purgatory SS WPAP
Comal County, Texas

amec | Project No. AU1412 | Attachment B

6/20/2014

P:\0000_AUS_SOUTH\AU1412 - Purgatory SS WPAP\WPAP - General\ GIS\MXD\Figures\Purgatory_SS_WPAP.mxd

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SEP 18 2014
COUNTY ENGINEER

General Information Form 0587
ATTACHMENT C: Project Description
Pedernales Electric Cooperative, Inc. (PEC) – Purgatory Road Substation

The proposed Pedernales Electric Cooperative, Inc. ("PEC") Purgatory Substation site ("Site") is located on the west side of Purgatory Road, at the intersection of Purgatory Road and Wegner Road, approximately 0.7 miles northeast of the Purgatory Road/FM 306 split. (see Attachment A – Road Map). The Site is located in an unincorporated area of Comal County, is not within an Extra-Territorial Jurisdiction ("ETJ") and is within the Edwards Aquifer Recharge Zone ("EARZ"). The project consists of installing an electrical utility substation along an existing power transmission corridor. The new substation will occupy 2.05 acres of the 5.06-acre Site and will contain equipment typical of electrical utility facilities, including transformers, circuit breakers, and a control house, grounding grids, and related equipment and supporting structures. The substation will be built on a 6-inch pad of compacted crushed limestone roadbase material and the grounds will be covered with coarse gravel or "yard stone" typical of substations. The southern portion of the building pad will be within an excavated area that will be below existing grade and the northern portion will be raised above the existing grade on compacted fill. The cut and fill embankments will be covered with rock riprap for erosion protection.

The substation will be completely enclosed by a decorative concrete wall, with a main gate on the east side, at the Purgatory Road entrance to the Site, and a second gate located on the west side for access to transmission lines and poles located west of the facility. The main entrance driveway will be paved with asphalt at the connection to Purgatory Road, and will be constructed of compacted roadbase covered with gravel between the paved portion and main entrance to the substation. Only non-coal tar-based sealants will be used on the asphalt portion of the driveway.

All of the developed area will consist of new impervious cover, comprising hard structures such as concrete foundations, support structures, and the control house roof, as well as the open areas between these structures that will be compacted roadbase covered with yard stone. The total impervious area, including the entrance driveway, the main substation area, the west access drive, and the fill embankment along the north side will be 2.05 acres.

The substation, after construction and once operating, will be unmanned most of the time. PEC personnel will visit the facility periodically and as needed to inspect and maintain the equipment and associated transmission lines and poles, and to inspect and maintain permanent stormwater Best Management Practices ("BMPs").

There will be no permanent on-site sewage facilities at the substation, and no wastewater or sewage will be generated at the Site during operation.

The primary permanent structural BMPs for removal of suspended solids and other potential pollutants from stormwater runoff will be a sand filtration and sedimentation

basin system. This stormwater treatment facility has been designed as a "Partial Sedimentation and Filtration System," in accordance with criteria described in the guidance document, *Complying with the Edwards Aquifer Rules, Technical Guidance on Best Management Practices* (TCEQ publication RG-348, July 2005). All of the Stormwater runoff from the area within the substation walls will pass through the sedimentation/filtration system before being discharged from the Site. In addition to the sedimentation/filtration basin, vegetated filter strips will be employed downslope of a portion of the rock riprap-covered fill embankment on the north side of the substation to provide additional removal of suspended solids.

The sedimentation/filtration basin and the vegetated filter strips are designed such that the combination of these BMPs will remove more than 80 percent of the increased Total Suspended Solids (TSS) load calculated for the increase in impervious cover resulting from the development, as required by the TCEQ. The design and function of these BMPs are described in more detail in Attachment C to the Permanent Stormwater Section.

Form 0585

Geologic Assessment

Geologic Assessment
For Regulated Activities
on The Edwards Aquifer Recharge/transition Zones
and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

REGULATED ENTITY NAME: **Pedernales Electric Cooperative, Inc.**

TYPE OF PROJECT: _X_ WPAP __ AST __ SCS __ UST

LOCATION OF PROJECT: _X_ Recharge Zone
__ Transition Zone
__ Contributing Zone within the Transition Zone

PROJECT INFORMATION

1. _X_ Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE (Attachment A)**.

2. Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (*Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A*, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map. **(Soil Description – Attachment B)**

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
Rumple Comfort Assoc	B-C	<1.3

* Soil Group Definitions (Abbreviated)

A. Soils having a high infiltration rate when thoroughly wetted.

B. Soils having a moderate infiltration rate when thoroughly wetted.

C. Soils having a slow infiltration rate when thoroughly wetted.

D. Soils having a very slow infiltration rate when thoroughly wetted.

3. _X_ A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column. **(Attachment C)**

4. _X_ A **NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY** is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site. **(Attachment D)**

5. _X_ Appropriate **SITE GEOLOGIC MAP(S)** are attached **(Attachment E)**:

The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1" : 400'

Applicant's Site Plan Scale 1" = 60 '
Site Geologic Map Scale 1" = 60 '
Site Soils Map Scale (if more than 1 soil type) 1" = _____ '

6. Method of collecting positional data **(Attachment F)**:
   _X_ Global Positioning System (GPS) technology.
   __ Other method(s).

7. _X_ The project site is shown and labeled on the Site Geologic Map.

8. _X_ Surface geologic units are shown and labeled on the Site Geologic Map.

9. _X_ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
   __Geologic or manmade features were not discovered on the project site during the field investigation.

10. __ The Recharge Zone boundary is shown and labeled, if appropriate.

11. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.):

   __ There are 2(#) wells **test holes1** present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
      _X_ The wells **test holes** are not in use and have been properly abandoned.
      __ The wells are not in use and will be properly abandoned.
      __ The wells are in use and comply with 16 TAC Chapter 76.
   __ There are no wells or test holes of any kind known to exist on the project site.

1(See Addendum 1)

ADMINISTRATIVE INFORMATION

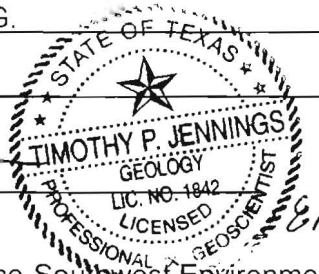
12. _X_ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

Date(s) Geologic Assessment was performed: February 25, 2014
Date(s)

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Timothy P. Jennings P.G. (512) 694-0235
Print Name of Geologist Telephone

tjenn@ecosouth.com
Fax



Signature of Geologist 8/28/14 Date

Representing: Eco-Southwest Environmental Corporation
(Name of Company)

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

Attachment A: Geologic Assessment Table
PEC - Purgatory Road Substation

ATTACHED

Attachment A: Geologic Assessment Table
PEC - Purgatory Road Substation

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME:																	
LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C *	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	INCLI	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
PR-1	N29 51 17.1	W98 06 50.4	CD	5	Kek	5	5	0.5	NA	0	NA	NA	O	5	10	10		<1.6		Hilltop
PR-2	N29 51 18.2	W98 06 51.4	O	5	Kek	1	1.5	0.8	NA	0	NA	NA	O	5	10	10		<1.6		Hilltop
PR-3	N29 51 19 2	W98 06 52.4	O	5	Kek	0.8	0.8	1	NA	0	NA	NA	O	5	10	10		<1.6		Hillside
PR-4	N29 51 20.0	W98 06 53.1	O	5	Kek	0.5	0.8	0.7	NA	0	NA	NA	O	5	10	10		<1.6		Hillside
PR-5	N29 51 19 2	W98 06 52.1	CD	5	Kek	4	4	0.8	NA	0	NA	NA	O	10	15	15		<1.6		Hillside
PR-6	N29 51 20.2	W98 06 53.7	O	5	Kek	15	3	1	N50W	0	NA	NA	O	25	30	30		<1.6		Hillside
PR-7	N29 51 19.1	W98 06 53.0	CD	5	Kek	8	8	0.8	NA	0	NA	NA	O	10	15	15		<1.6		Hillside
PR-8	N29 51 19.5	W98 06 53.9	O	5	Kek	0.5	0.5	>0.8	NA	0	NA	NA	O	20	25	25		<1.6		Hillside
PR-9	N29 51 19.8	W98 06 54.0	O	5	Kek	4	6	>2	NA	0	NA	NA	O	25	30	30		<1.6		Hillside
PR-10	N29 51 20.2	W98 06 56.3	O	5	Kek	2	1	>1	NA	0	NA	NA	O	25	30	30		<1.6		Hillside

* DATUM:

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

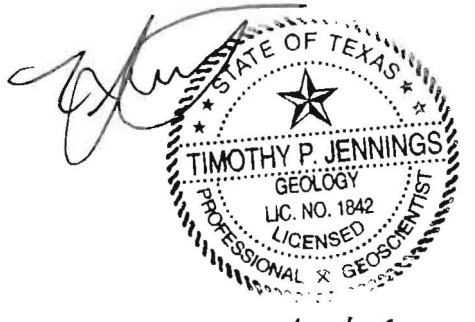
I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists The information presented here complies with that document and is a true representation of the conditions observed in the field.

My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Date

Sheet 1 of 1

TCEQ-0585-Table (Rev. 10-01-04)



8/28/14

Attachment B: Soils Description
PEC - Purgatory Road Substation

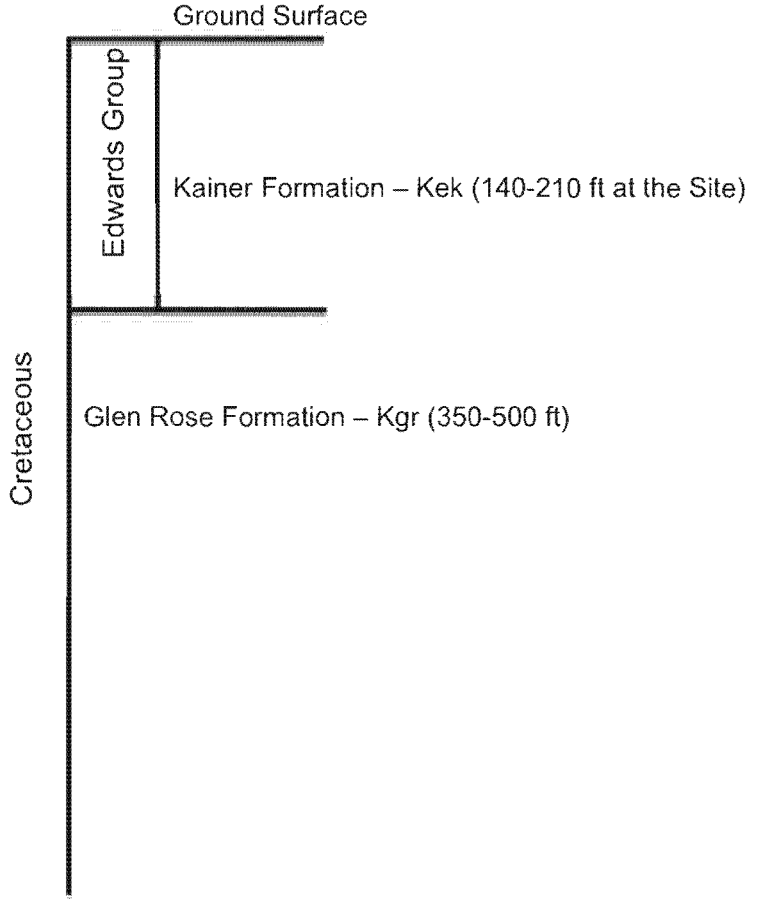
Soils at the site consist entirely of Rumple-Comfort Association (RUD) soils. The RUD consists of shallow to moderately deep soils on uplands in the Edwards Plateau. At the site soils are Rumple Series. Rumple soils form broad ridge tops and side slopes, are well drained, have moderately slow permeability, and have a very low available water capacity. At the Site, the surface is very typical of the RUD soils that develop on weathered Kainer Formation in that it forms an undulating surface of clayey loam with abundant chert and limestone cobbles. Soil thicknesses are up to approximately two feet, but typically less than one foot and are underlain by indurated limestone. A description of the characteristics of these soils based on site observations is provided below.

Rumple-Comfort Association – Consists of cherty clay loam, with up to 75 percent chert and limestone cobbles.

Soil Profile:

0-10 inches – Dark reddish brown cherty clay loam with rounded chert and limestone cobbles common on the surface.
10-14 inches – Dark reddish brown very cherty clay.
14- up to 28 inches – Very dark reddish brown, extremely stony clay with up to approximately 75 percent limestone fragments.

Attachment C: Stratigraphic Column
PEC - Purgatory Road Substation



Introduction

This narrative geologic assessment accompanies the Texas Commission on Environmental Quality (TCEQ) geologic assessment form # TCEQ-0585 completed for the Pedernales Electric Cooperative, Inc. (PEC) Purgatory Road Substation Water Pollution Abatement Plan (WPAP). The assessment area (Site) encompasses approximately 5 acres in the Edwards Aquifer Recharge Zone (as designated by the TCEQ). The entire assessment area is on undeveloped property on the west side of Purgatory Road where Wegner Road intersects, in western Comal County, Texas. The property is moderately vegetated with oak and cedar trees typical of the Edwards Plateau. An overhead power line easement transects the property from west to east. The LCRA intends to construct an electricity transmission substation on the property for the Pedernales Electric Cooperative.

Methodology

Field reconnaissance for the subject Geologic Site Assessment was performed by Mr. Timothy Jennings P.G. on February 25, 2014. Prior to performing the field survey, Mr. Jennings identified, compiled, and reviewed available geologic data in the vicinity of the assessment area. Published geologic and soil data were reviewed including the Geologic Atlas of Texas, San Antonio Sheet, Geologic map of the Edwards Aquifer Recharge Zone and the Soil Survey of Comal County. According to the Texas Speleological Survey, there are no mapped caves in the immediate vicinity of the assessment area. In addition, a recent aerial photograph of the area was reviewed to identify natural and manmade features to be inspected in the field.

During the field reconnaissance, surface geology, potential recharge features, and other significant geologic and manmade features were mapped using an aerial photograph and closely spaced traverses. Features identified on the Geologic Assessment Table and discussed in this narrative were located on the Geologic Map using a hand-held global positioning system (GPS) unit, supported by a high resolution aerial photograph, which allowed accurate placement of the features.

Description of Assessment-Area Specific Soils and Geology

As previously stated, the project site is located on undeveloped property typical of the Edwards Plateau. The assessment area is covered almost entirely by Rumple soils of the Rumple-Comfort Association, along with sub-crop areas of the Kainer Formation. Undulating surfaces typical of weathered Kainer Formation outcrop areas and associated soil horizons (RUD) were observed across most of the Site.

The Site is located within the outcrop area of the lower dolomitic member of the Kainer Formation, the base of the Edwards Group and the rock formations that make up the Edwards Aquifer. Outcrops of the Kainer Formation consist of chert-bearing crystalline dolomitic limestone. This unit lies beneath the evaporate member and is therefore not predisposed to karsting. Karst features observed in the dolomitic member are typically created by fracturing or enlargement along bedding planes. Outcrops of the Kainer Formation observed at the Site were predominantly found in localized areas along a low hill side. Other areas, mapped as Kainer sub-crop, are where boulders and concentrated limestone and chert rubble indicate in-place Kainer is likely just below the surface. Beneath the Kainer Formation lies the Glen Rose Formation. A stratigraphic column for the assessment area is presented in Attachment C.

Assessment Area Geology and Physiography

The assessment area is located in the Edwards Aquifer Recharge Zone. The entire assessment area is located on undeveloped property typical of the Edwards Plateau. In-place exposures are limited to relatively small outcrops of Kainer Formation dolomitic limestone along a hill side on the north side of the property. Sub-crop areas where in-place bedrock is indicated to be near the surface, occur across

the north and south side of the Site (Attachment E). The remainder of the Site is covered by Rumple soils of the Rumple-Comfort Association. The nature and appearance of the surface at the Site is very typical of Kainer Formation exposures.

The topography of the assessment area consists of a hill top which slopes gently to the west. Along the north side of the property, the hill top gently breaks to a north-northwest sloping hill side. There is no significant drainage feature in the assessment area. Surface runoff is via sheet flow or small areas of preferential flow. The elevation in the assessment area ranges from approximately 1076 feet above mean sea level (msl) near the southeast corner of the Site, to approximately 1037 feet above msl near the northwest corner.

Although ten features were identified in accordance with the requirements of the Edwards Aquifer Protection Plan guidance, none of these is considered sensitive as defined in the Geologic Assessment Table (Attachment A). A narrative summary of all features identified in the assessment area is provided in the final section of this Narrative Geologic Assessment.

Assessment Area Structure

Based on a review of regional geologic structural features, there is a regionally mapped north-trending fault associated with the Balcones Fault Zone, located less than one mile west of the Site. However, close traversing of the property, including an inspection for specific indications of faulting, found no evidence of faulting in the assessment area. Fracturing was observed in the exposures of the Kainer Formation; however, these fractures do not have a predominant trend, do not appear to be associated with faulting, and do not appear to be enlarged by solutioning, but rather appear to be related to natural weathering of the Kainer Formation. The observed fractures were typically filled with very low permeability clay. Additionally, during the site reconnaissance, evidence that rainwater sheet flows over and past these fractured outcrop areas was observed.

Karstic Characteristics

No karst or karst-related features were observed during the site reconnaissance. Since the dolomitic member of the Kainer Formation underlies the evaporatic member, and there is no faulting or significant fracturing to promote solutioning, the presence of karst features or future development of karst features within the assessment area, is considered unlikely.

Assessment Area Features

During site reconnaissance, ten features were identified. The locations of identified features were mapped using an aerial photograph base map. The latitude and longitude were determined using a hand held GPS unit, with an accuracy rating of less than 33 feet. Latitude and longitude information are provided in Attachment A. Photographs of the site features are presented in Attachment G. A description of each feature identified at the assessment area and listed on the Geologic Assessment Table, is provided below:

PR-1: Closed depression - approximately 6 feet in diameter and approximately 0.5 feet deep, beneath large oak tree in thick brush. Hand digging revealed approximately 0.5 feet of leaves and other decaying vegetation on top of hard packed clay soil in the bottom of the depression. PR-1 is located near the top of a hill with no indication of rapid infiltration.

PR-2: Shallow Opening – 1 foot by 1.5 feet and approximately 0.8 feet deep, filled with dead tree stump and leaves. Hand digging revealed hard packed clay soil at approximately 1-foot below ground surface. This is possibly an old animal burrow located near the top of a hill with no indication of rapid infiltration.

PR-3: Opening between boulders in low ledge stone - is approximately 0.8 feet by 0.8 feet and approximately one foot deep. Opening is clean at surface but base is filled with hard packed clay soil with no evidence that the feature receives rapid recharge or is open to the subsurface.

PR-4: Opening between boulders at base of low ledge stone - is approximately 0.5 feet by 0.8 feet and approximately 0.7 feet deep. Opening may have been created by animal activity and is filled with hard packed clay soil with no evidence that the feature receives rapid recharge or is open to the subsurface.

PR-5: Closed depression – approximately 6 feet by 4 feet and approximately 0.8 feet deep. The depression is at the base of a low ledge stone outcrop and is likely caused by erosion as rain water sheet flows over the outcrop. There is a small fracture in the ledge stone, but it is only approximately 0.5 feet deep and is filled with clay soil. The depression is filled with clay soil and cobbles (typical of Rumple Soils). Vegetation around the depression indicates water does not likely accumulate and stand for a prolonged period – likely on the upper end of low infiltration.

PR-6: Vuggy Ledge Stone – outcrop is approximately 15 feet long (broken and heavily weathered), three feet wide and the outcrop itself is approximately 1 foot thick. Vugs range in size from <0.5-inch to 3-inch diameter, and the majority are filled or the bottoms are filled with clay soil. Surface runoff is not focused to this feature and there is no evidence of rapid recharge.

PR-7: Closed depression – approximately 8 feet by 8 feet and approximately 0.8 feet deep. The depression is at the base of a low ledge stone outcrop and is likely caused by erosion as rain water sheet flows over the outcrop. The depression is filled with clay soil and cobbles (typical of Rumple Soils). Vegetation around the depression indicates water does not likely accumulate and stand for a prolonged period – likely on the upper end of low infiltration.

PR-8: Possible Animal Burrow – this is a small 6-inch triangular shaped opening in soil above the roots of a large oak tree. The opening to the subsurface is believed to be caused by upheaval of the tree roots, probing was unable to detect the bottom of the opening. The opening is on an elevated area of ground and does not receive significant runoff, and appears to be actively used by small animals.

PR-9: Low ledge stone with openings to the subsurface – the ledge stone is very heavily weathered, but has two primary openings to the subsurface. Both openings are roughly 0.7 foot in diameter. Probing and hand digging found the openings to narrow downward and the bottom of the openings to be approximately two feet below ground surface and filled with hard packed clay soil. Although the feature appears to be clean and maintained at the surface, there is no indication in the subsurface that this feature receives rapid infiltration. Additionally, its location on a hillside with no focused drainage to the feature, limits the amount runoff received. This feature appears to be and is interpreted as openings between boulders that are at or near the in-place outcrop, but have moved enough to create the above described openings. They are not solution cavities.

PR-10: Rock outcrop with openings to the subsurface – Primary opening is approximately 2 feet by 1 foot. Probing and hand digging found the opening to narrow downward and the bottom of the opening to be approximately one foot below ground surface and filled with hard packed clay soil. . At the surface the feature is clay-lined and partially filled with organic material (leaves and sticks) and some small cobbles. Sheet flow surface runoff is evident near the feature, but appears that most of the sheet flow goes around that feature, not toward it. This feature appears to be and is interpreted as openings between boulders that are at or near the in-place outcrop, but have moved enough to create the above described openings to the subsurface. They are not solution cavities.

Attachment E: Site Geologic Map
PEC - Purgatory Road Substation

ATTACHED

LEGEND

———	Site Boundary
PR-1 ●	Feature Identified on GA table
KeK	Cretaceous Edwards Kainer Fm
KeK Sub	Subcrop of Kainer Fm
RUD	Rumple–Comfort Soil Association
SB-1 ⊕	Plugged and Abandoned Soil Test Boring (Terracon, April 2014)

60 30 0 60

(APPROXIMATE SCALE IN FEET)

STATE OF TEXAS
TIMOTHY P. JENNINGS
GEOLOGY
LIC. NO. 1842
LICENSED
PROFESSIONAL GEOSCIENTIST

8/28/14

SOURCE:
GOOGLE MAPS PROVIDED THE AERIAL BACKGROUND, DATED 2-2013.

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

GEOLOGIC SITE ASSESSMENT
FEBRUARY 25, 2014

Eco-Southwest Environmental Corp.
TBPG Registration #50207

PROJECT: -	BY: K2P-RR	Figure No. 1
DATE: AUG. 2014	CHECKED: TPJ	

Plot Date: 08/22/14 - 9:32am, Plotted by: roodrj
Drawing Path: K:\ACAD\clients\Eco-Southwest\Purgatory Rd\, Drawing Name: GEO-MAP.dwg

Attachment F: Method of Location Data Collection
PEC - Purgatory Road Substation

Latitude and Longitude Data:

Datum: WGS84

Method: Hand Held GPS

Date of Data Collection: February 25, 2014

Horizontal Accuracy: Horizontal Accuracy of 10 meters (33 feet)

Measurements Made By: Timothy P. Jennings P.G.

Mapped Location:

Mapped locations, as shown on the Site Geology Map, were placed using high resolution aerial photography supported by the GPS data.

ATTACHED

Photograph No. 1 – (PR-1) closed depression after hand digging partially filled with organic material and has a clay soil bottom.

Photograph No. 2 – (PR-2) shallow opening – 1 foot by 1.5 feet and approximately 0.8 feet deep, filled with dead tree stump and leaves. Hand digging revealed hard packed clay soil at approximately 1-foot.

Photograph No. 3 – (PR-3) Opening between boulders in low ledge stone - opening is clean at surface but base is filled with hard packed clay soil with no evidence that the feature receives rapid recharge or is open to the subsurface.

Photograph No. 4 – (PR-4) opening between boulders at base of low ledge stone - may have been created by animal activity and is filled with hard packed clay soil with no evidence that the feature receives rapid recharge or is open to the subsurface..

Photograph No. 5 – (PR-5) closed depression – approximately 6 feet by 4 feet and approximately 0.8 feet deep. The depression is at the base of a low ledge stone outcrop. A small fracture in the ledge stone is only approximately 0.5 feet deep and is filled with clay soil. The depression is filled with clay soil and cobbles (typical of Rumple Soils).

Photograph No. 6 – (PR-6) vuggy ledge stone outcrop is broken and heavily weathered, Vugs are mostly filled with clay soil. Surface runoff is not focused to this feature and there is no evidence of rapid recharge.

Photograph No. 7 – (PR-7) closed depression at the base of a low ledge stone outcrop - likely caused by erosion as rain water sheet flows over the outcrop.

Photograph No. 8 – (PR-8) Possible Animal Burrow – this is a small 6-inch triangular shaped opening in soil above the roots of a large oak tree. The opening to the subsurface is believed to be caused by upheaval of the tree roots, probing was unable to detect the bottom of the opening. The opening is on an elevated area of ground and does not receive significant runoff, and appears to be actively used by small animals.

Photograph No. 9 – (PR-9) Low ledge stone with openings to the subsurface – located on a hillside with no focused drainage to the feature, limits the amount runoff received. This feature appears to be and is interpreted as openings between boulders that are at or near the in-place outcrop. Not solution cavities.

Photograph No. 10 – (PR-10) Rock outcrop with openings to the subsurface At the surface the feature is clay-lined and partially filled with organic material (leaves and sticks) and some small cobbles. These are not solution cavities.

Form 0584

Water Pollution Abatement Plan Application

Water Pollution Abatement Plan Application
for Regulated Activities
on the Edwards Aquifer Recharge Zone
and Relating to 30 TAC §213.5(b), Effective June 1, 1999

REGULATED ENTITY NAME: Pedernales Electric Cooperative, Inc (PEC)

REGULATED ENTITY INFORMATION

1. The type of project is:
   - ___ Residential: # of Lots: _____
   - ___ Residential: # of Living Unit Equivalents: _____
   - ___ Commercial
   - X Industrial
   - X Other: electric substation

2. Total site acreage (size of property): 5.06

3. Projected population: none

4. The amount and type of impervious cover expected after construction are shown below:

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	26,049	÷ 43,560 =	.598
Parking	0	÷ 43,560 =	0
Other paved surfaces	63,162	÷ 43,560 =	1.45
Total Impervious Cover	89211	÷ 43,560 =	2.05
Total Impervious Cover ÷ Total Acreage x 100 = 40.5 %			

5. X **ATTACHMENT A - Factors Affecting Water Quality.** A description of any factors that could affect surface water and groundwater quality is provided at the end of this form.

6. X Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

FOR ROAD PROJECTS ONLY

Complete questions 7-12 if this application is exclusively for a road project.

7. Type of project:
   - ___ TXDOT road project.
   - ___ County road or roads built to county specifications.
   - ___ City thoroughfare or roads to be dedicated to a municipality.
   - ___ Street or road providing access to private driveways.

8. Type of pavement or road surface to be used:
   - ___ Concrete
   - ___ Asphaltic concrete pavement
   - ___ Other: _____

9. Length of Right of Way (R.O.W.): ____ feet.
Width of R.O.W.: ____ feet.
L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = ____ acres.

10. Length of pavement area: ____ feet.
Width of pavement area: ____ feet.
L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = ____ acres.
Pavement area ____ acres ÷ R.O.W. area ____ acres x 100 = ___% impervious cover.

11. __ A rest stop will be included in this project.
__ A rest stop will **not** be included in this project.

12. __ Maintenance and repair of existing roadways that do not require approval from the TCEQ Executive Director. Modifications to existing roadways such as widening roads/adding shoulders totaling more than one-half (1/2) the width of one (1) existing lane require prior approval from the TCEQ.

STORMWATER TO BE GENERATED BY THE PROPOSED PROJECT

13. _X_ **ATTACHMENT B - Volume and Character of Stormwater.** A description of the volume and character (quality) of the stormwater runoff which is expected to occur from the proposed project is provided at the end of this form. The estimates of stormwater runoff quality and quantity should be based on area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

WASTEWATER TO BE GENERATED BY THE PROPOSED PROJECT

14. The character and volume of wastewater is shown below:

__% Domestic	0 gallons/day
__% Industrial	0 gallons/day
__% Commingled	0 gallons/day
TOTAL	0 gallons/day

15. Wastewater will be disposed of by:
_N/A_ **On-Site** Sewage Facility (OSSF/Septic Tank):
__ **ATTACHMENT C - Suitability Letter from Authorized Agent.** An on-site sewage facility will be used to treat and dispose of the wastewater. The appropriate licensing authority's (authorized agent) written approval is provided at the end of this form. It states that the land is suitable for the use of an on-site sewage facility or identifies areas that are not suitable.
__ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

__ Sewage Collection System (Sewer Lines):
__ Private service laterals from the wastewater generating facilities will be connected to an existing SCS.
__ Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.
__ The SCS was previously submitted on _____.

__ The SCS was submitted with this application.
__ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

The sewage collection system will convey the wastewater to the _____ (name) Treatment Plant. The treatment facility is:
__ existing.
__ proposed.

16. __ All private service laterals will be inspected as required in 30 TAC §213.5.

SITE PLAN REQUIREMENTS

Items 17 through 27 must be included on the Site Plan.

17. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = 60 '.

18. 100-year floodplain boundaries
__ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
X No part of the project site is located within the 100-year floodplain.

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s):
FEMA FIRM for Comal County, Texas, Map No. 480901C0280F

19. X The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Show lots, recreation centers, buildings, roads, etc.
__ The layout of the development is shown with existing contours. Finished topographic contours will not differ from the existing topographic configuration and are not shown.

20. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):
X There are 2 (#) wells (**test holes)** present on the project site and the locations are shown and labeled. (Check all of the following that apply)
__ The wells are not in use and have been properly abandoned.
X The wells (**test hole**s)are not in use and will be properly abandoned.
__ The wells are in use and comply with 16 TAC §76.
__ There are no wells or test holes of any kind known to exist on the project site.
THERE ARE TWO PROPERLY ABANDONNED TEST HOLES ON THE SITE, LOCATIONS ARE SHOWN

21. Geologic or manmade features which are on the site:
__ All **sensitive** geologic or manmade features identified in the Geologic Assessment are shown and labeled.
X No **sensitive** geologic or manmade features were identified in the Geologic Assessment.
__ **ATTACHMENT D - Exception to the Required Geologic Assessment.** An exception to the Geologic Assessment requirement is requested and explained at the end of this form.

22. X The drainage patterns and approximate slopes anticipated after major grading activities.

23. _X_ Areas of soil disturbance and areas which will not be disturbed.

24. _X_ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.

25. _X_ Locations where soil stabilization practices are expected to occur.

26. _N/A_ Surface waters (including wetlands).

27. _X_ Locations where stormwater discharges to surface water or sensitive features.
__ There will be no discharges to surface water or sensitive features.

ADMINISTRATIVE INFORMATION

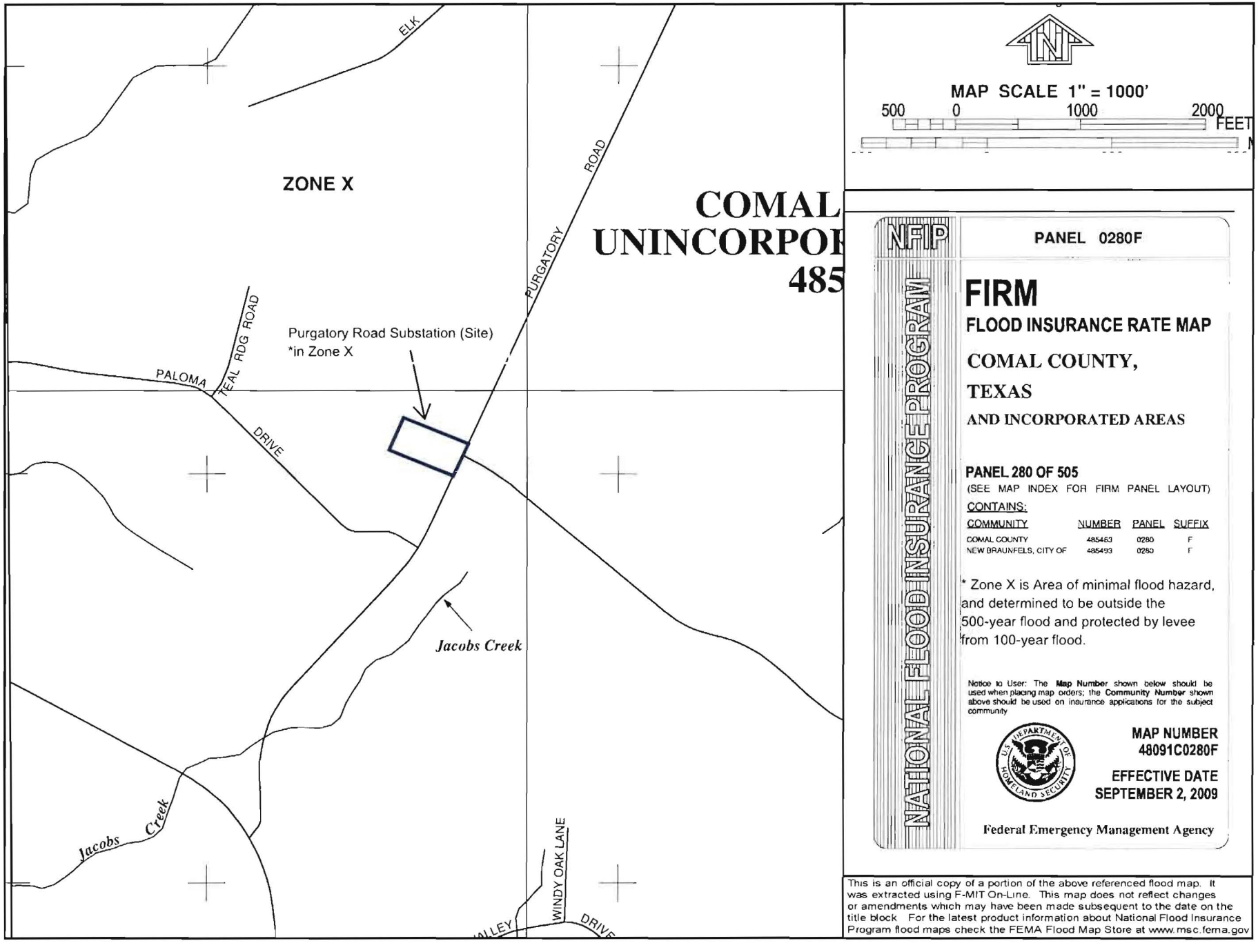
28. _X_ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

29. _X_ Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **WATER POLLUTION ABATEMENT PLAN APPLICATION FORM** is hereby submitted for TCEQ review and Executive Director approval. The form was prepared by:

Brock Langley, P.E.
Print Name of Customer/Agent

R. Brock Langley 9/3/2014
Signature of Customer/Agent Date



This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Water Pollution Abatement Plan Application Form 0584
ATTACHMENT A: Factors Affecting Water Quality
Pedernales Electric Cooperative, Inc – Purgatory Road Substation

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The primary factor having the potential to affect surface water quality will be soil erosion resulting in transport of fine solids suspended in storm water runoff. Other factors affecting the quality of stormwater runoff associated with this development include potential leaks from oil-filled transformers and other substation equipment, spills of fuels and lubricants from vehicles and equipment, construction-related erosion and sediment transport, sanitary wastes (during construction phase only), and site trash/debris.

Temporary and permanent Best Management Practices (BMPs) will be implemented at the site to mitigate these factors, as described in detail in Sections 0600 and 0602. Earthen diversion berm(s), silt fence, other temporary storm water BMPs will be installed prior to disturbance of land to control the flow of storm water and to capture sediment. A rock berm will also be constructed where shown on the drawings and remain in place post construction. A permanent sand filtration basin will be constructed to capture all stormwater runoff generated from the substation. Any spills or leaks will be cleaned up in a timely manner and the resulting wastes will be disposed of properly. Trash receptacles and portable toilet facilities will be placed on site for use by site personnel, when present. PEC personnel will only be present at the site periodically; the site will be unmanned most of the time.

Water Pollution Abatement Plan Application Form 0584
ATTACHMENT B: Volume and Character of Stormwater
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

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The total area of the subject property is approximately 5.06 acres, and most of the land is currently undeveloped. An existing PEC power transmission line corridor traverses the site in a northeast to southwest alignment; this area is clear of trees and other large woody vegetation but has well-established vegetative cover consisting of native grasses, shrubs, and cactus. The other areas of the Site are characterized by well-established native grasses, trees, and cactus, with some rock outcrop and loose rock fragments and cobbles on the ground surface. The Site soils consist of the Rumple Series, part of the Rumple-Comfort Association. Rumple soils area described as very gravelly clay loam and gravelly clay loam, and are classified as Hydrologic Soil Group C. Depth to bedrock, which is indurated limestone, is up to 2 feet but typically less than 1 foot, with slopes ranging from 2.6 percent in the southeastern portion of the Site to more than 12 percent in the north and northwestern portions of the Site.

The runoff coefficient as would be used in Rational Method calculation of peak flows for these areas is estimated to be 0.37 in the existing pre-development condition. Existing pre-development drainage areas and runoff flow patterns are shown on Sheet 0600-F-2.

The proposed electrical substation will result in a net increase in impervious cover on the project site. The total area within the walls of the proposed substation is 1.82 acres, located in the east-central part of the property (see Sheet 0600 F-3). The proposed development, including the substation, driveways, and riprap-covered embankment on the north side of the substation, will increase the impervious cover within the affected drainage areas to a total of 2.05 acres. The interior area of the substation will have a finished grade of 1.0 percent, sloping from east to west, and the surface will consist of a 3-inch layer of coarse gravel over compacted crushed limestone flexible base material. The Rational Method runoff coefficient for the substation in the developed condition is estimated to be 0.55. Fill embankments along the northern perimeter of the substation, and separated from the interior area by a decorative concrete wall, will be sloped at 3:1 (horizontal to vertical). The embankments will be covered with rock riprap. The driveways will have the same gravel cover over flexible base as the substation interior, except for an asphalt-paved section where the main entrance drive meets Purgatory Road on the east side of the Site. The post-development drainage areas and runoff flow patterns are shown on Sheet 0600-F-3.

Stormwater runoff from developed areas of the Site may carry an increased level of total suspended solids (TSS) compared to runoff from the Site in the predevelopment condition; however, a sand filtration/sedimentation basin will intercept and capture/treat all of the runoff from within the substation, which comprises 89 percent of the new impervious cover at the Site.

Runoff calculations were performed using Soil Conservation Service (SCS; now the Natural Resource Conservation Service) methods described in the U.S. Department of

Agriculture publication, *TR-55 - Urban Hydrology for Small Watersheds* (June 1986) ("TR-55"), and the U.S. Army Corps of Engineers computer model HEC-HMS. The SCS Curve Number Method was used in the HEC-HMS model to calculate peak discharge and velocity values for both pre-developed and proposed post-developed conditions. Curve numbers (CNs) were developed for the pre- and post-development runoff calculations using the methods and values published in TR-55. The CN values used in the HEC-HMS model are summarized in the following table.

Existing Pre-Development Conditions

Catchment Area	CN
1	74
2	77
3	77
4	75

Post-development Conditions

Catchment Area	CN
A1	79
A2	75
B1	91
B2	84
C1	81
C2a	86
C2b	82

Peak runoff discharge rates developed using the HEC-HMS model for the pre- and post-development conditions are summarized in the following table.

Existing Pre-Development Conditions

Catchment Area	Q25 year (cfs)	Q100 year (cfs)
1	3.5	5.3
2	4.8	7.0
3	4.3	6.3
4	1.3	1.9

Post-development Conditions

Catchment Area	Q25 year (cfs)	Q100 year (cfs)
A1	3.6	5.3
A2	4.3	6.3
B1& B2 (combined)	1.8	5.4
C1	1.9	2.7
C2a	.79	1.1
C2b	.34	.48

Water Pollution Abatement Plan Application Form 0584
ATTACHMENT C: Suitability Letter from Authorized Agent
Pedernales Electric Cooperative, Inc – Purgatory Road

Not Applicable.

Water Pollution Abatement Plan Application Form 0584
ATTACHMENT D: Exception to the Required Geologic Assessment
Pedernales Electric Cooperative, Inc – Purgatory Road

Not Applicable.

Form 0602

Temporary Stormwater Section

Temporary Stormwater Section
for Regulated Activities
on the Edwards Aquifer Recharge Zone
and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

REGULATED ENTITY NAME: Pedernales Electric Cooperative, Inc

POTENTIAL SOURCES OF CONTAMINATION

Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

   ___ Aboveground storage tanks with a cumulative storage capacity of less that 250 gallons will be stored on the site for less than one (1) year.

   ___ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.

   ___ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An **Aboveground Storage Tank Facility Plan** application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

   _x_ Fuels and hazardous substances will not be stored on-site.

2. _x_ **ATTACHMENT A - Spill Response Actions**. A description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is provided at the end of this form.

3. _n/a_ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature. **No temporary ASTs of ≥250 gal will be used on the project.**

4. _x_ **ATTACHMENT B - Potential Sources of Contamination.** Describe in an attachment at the end of this form any other activities or processes which may be a potential source of contamination.

   ___ There are no other potential sources of contamination.

SEQUENCE OF CONSTRUCTION

5. _x_ **ATTACHMENT C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is provided at the end of this form. For each activity described, an estimate of the total area of the site to be disturbed by each activity is given.

6. _x_ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: **Cordova Hollow to Guadalupe River**

TEMPORARY BEST MANAGEMENT PRACTICES (TBMPs)

Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. **All structural BMPs must be shown on the site plan.**

7. _x_ **ATTACHMENT D - Temporary Best Management Practices and Measures.** A description of the TBMPs and measures that will be used during and after construction are provided at the end of this form. For each activity listed in the sequence of construction, include appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

_x_ TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information has been provided in the attachment at the end of this form

a. A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

b. A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

c. A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

d. A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

___ **ATTACHMENT E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is provided at the end of this form. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

_x_ There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. _x_ **ATTACHMENT F - Structural Practices.** Describe the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains has been avoided.

10. X **ATTACHMENT G - Drainage Area Map**. A drainage area map is provided at the end of this form to support the following requirements.

__ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

__ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

__ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

x There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

11. N/A **ATTACHMENT H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure has been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are provided as at the end of this form.

12. X **ATTACHMENT I - Inspection and Maintenance for BMPs.** A plan for the inspection of temporary BMPs and measures and for their timely maintenance, repair, and, if necessary, retrofit is provided at the end of this form. A description of documentation procedures and recordkeeping practices is included in the plan.

13. X All control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicates a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. X If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. X Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. X Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

SOIL STABILIZATION PRACTICES

Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

17. X **ATTACHMENT J - Schedule of Interim and Permanent Soil Stabilization Practices.** A schedule of the interim and permanent soil stabilization practices for the site is attached at the end of this form.

18. X Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. X Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

ADMINISTRATIVE INFORMATION

20. X All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

21. X If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

22. X Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **TEMPORARY STORMWATER SECTION** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Brock Langley, P.E.
Print Name of Customer/Agent

R. Brock Langley
Signature of Customer/Agent

9/3/2014
Date

Temporary Stormwater Section 0602
ATTACHMENT A: Spill Response Actions
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

PEC has developed the following Spill Response Actions Plan which outlines general procedures regarding spill prevention, employee training, and response actions.

- Determine the cause of the spill or leak and stop it if possible.
- Initiate spill containment action with the required and appropriate measures including employee personnel, equipment, and materials.
- Identify and lessen fire, explosion, and vapor hazards.
- Do not permit smoking in the spill area.
- In the event of a potential fire or explosion hazard, notify the fire department, evacuate all personnel to a safe location and secure the area.
- If spilled oil or other potentially harmful liquid has the potential to flow into the sedimentation/filtration basin, close the gate valve located upstream of the final discharge point from the basin underdrain piping.
- Visually inspect all spills or exposed areas and prevent further migration of the spill.
- Estimate the quantity of material spilled, and determine whether the amount of spilled material exceeds a Reportable Quantity (RQ). Alert all adjacent property owners if personal danger is possible or if any part of the discharge is going to leave the property or premises.
- Initiate cleanup and removal operation in accordance with state and federal guidelines.
- Remedy all hazards posed by the contaminated soils and the excavated area.

Certain of these procedures will be applicable, or not, depending on the size and severity of the spill. In most anticipated cases for this Site, spills will be small and easily controlled. The largest single quantity of oil present in a single container will be in the transformers, which will be located within concrete secondary containment structures sized to capture more than the quantity of oil inside the transformers. In the case of a major spill event, such as might occur during maintenance or as a result of an accident involving a transformer, most of the oil would be absorbed within the yard stone within the substation. If such a spill were to occur during a heavy rain event, the oil could reach the sedimentation/filtration pond. A gate valve will be installed upstream of the final outfall from the sand filter underdrain piping. In the unlikely event that spilled oil reaches the sand filter, the gate valve can be closed manually to prevent oil from passing through the sand filter and discharging via the underdrain system.

Physical Spill Cleanup:

The most likely source of spills during the construction phase would be fluids leaking from construction equipment, or accidental damage to a transformer or other equipment containing oil. Spill kits (absorbent booms, pads, and other appropriate items) will be

available on the site throughout the construction phase. A kit will be brought to a specific area during construction activities so that it can be used to assist in spill control, if needed. In the case of a spill, soil/material will be collected and contained in steel drums or other appropriate weather-proof and leak-proof container pending characterization and disposal.

Recordkeeping and Reporting:

- The PEC Site Manager must be notified immediately of any spills that occur so that he may determine if reporting is necessary and report the release to the appropriate agency in the required period of time (per Title 30 Texas Administrative Code [30 TAC] §327.3). The Texas Commission on Environmental Quality (TCEQ) will be notified of any "reportable spills" within 24 hours of the spill or discharge. The RQ for oil spills to land in Texas is 210 gallons.

Emergency Response Telephone Numbers:
TCEQ San Antonio Regional Office: 210-490-3096
Spill Reporting Hotline: 1-800-932-8224

In the event of an oil spill, the facility, date, time, location of spill, type and amount of product spilled, cause of spill, company personnel notified and time, regulatory agencies notified (including comments, names and time) corrective action, comments, and the name of the environmental coordinator will be recorded for reporting and recordkeeping purposes.

Temporary Stormwater Section 0602
ATTACHMENT B: Potential Sources of Contamination
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

The following potential sources of contamination of surface water and groundwater are anticipated on this project:

- fine solids (including dust and water-borne suspended solids) generated by site preparation activities such as, clearing of vegetation, removal of soil, excavating rock, and other site construction activities;
- diesel fuel, hydraulic fluid, and lube oils used in construction equipment;
- domestic waste from construction workers; and
- trash/debris.

Mobile equipment (e.g., trucks, bulldozers) will be fueled on site using small (<250 gallon) portable truck- or trailer-mounted fuel tanks. All fueling of mobile equipment will be conducted in the bermed fueling pad area.

Truck or trailer-mounted diesel fuel transfer tanks will be refilled off site.

Temporary Stormwater Section 0602
ATTACHMENT C: Sequence of Major Activities
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

General sequence of construction activities and estimated areas of soil disturbance:

1. **Install Temporary Stormwater BMPs** – Install perimeter silt fencing, rock berms, interceptor/diversion dikes, construction staging area, and stabilized construction exit prior to commencing other construction activities.

   Estimated area of soil disturbance for this activity: 1.0 acre.

2. **Perform Initial Site Preparation Work** - Construct site access driveway; remove selected trees and clear the substation and stormwater pond areas.

   Estimated area of soil disturbance for this activity: 3 acres.

3. **Excavate stormwater pond** – excavate pond to full depth; construct berms around pond.

   Estimated area of soil disturbance for this activity: 1.0 acre.

4. **Substation earthwork** – cut and fill; build substation pad.

   Estimated area of soil disturbance for this activity: 2.5 acres.

5. **Construct substation and filtration/sedimentation basin**.

   Estimated area of soil disturbance for this activity: 3.0 acres.

6. **Restore/stabilize remaining areas of disturbed soil** - Prepare remaining disturbed soil surfaces and seed with permanent grasses.

   Estimated area of soil disturbance for this activity: 3 acres.

7. **Maintain Permanent Stormwater BMPs** – Perform maintenance as needed on BMPs installed as both temporary and permanent (selected rock berms and diversion dikes, areas seeded for erosion control).

Temporary Stormwater Section 0602
ATTACHMENT D: Temporary Best Management Practices and Measures
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Temporary BMPs for the site construction will consist of installing the following controls:

- silt fencing,
- earthen interceptor/diversion dikes,
- rock berms, and
- stabilized construction entrance.

Silt fencing will be installed along the downslope side of all areas of disturbance prior to initiation of any soil disturbing activities in those areas. The purpose of the silt fencing is to detain sheet flow runoff from disturbed areas to allow settlement of solids entrained in the water, and to filter the water as it flows through the fence fabric, before discharging from the site.

Earthen interceptor/diversion berms will be constructed in the locations shown on the attached site plans (Sheet 0600 F-4) to divert run-on stormwater from off-site, upgradient areas. Earthen diversion dikes and rock berms will be constructed as temporary BMPs and, in the locations indicated on the plans, left in place as permanent BMPs.

An entrance driveway paved with compacted crushed limestone road base material and topped with gravel will be constructed to serve as the main access way for incoming and outgoing vehicles. A stabilized construction entrance will be installed at the site entrance at Purgatory Road for the construction phase. The purpose of the construction entrance is to provide a stable, all-weather surface at this high-traffic location. The construction entrance also facilitates removal of soil attached to tires of construction vehicles before they exit the site, reducing tracking of soils onto the public roads.

Rock berms will be installed where indicated on the plans, at locations of concentrated flow where silt fencing may not perform adequately. The purpose of the rock berms is to reduce the velocity of runoff in sheet flow and shallow concentrated flow, and to detain the water, facilitating settlement of solids entrained in the water before discharging from the site.

All of the described temporary BMPs will be constructed in accordance with the details shown on the attached plans (Sheets 0600 F-7 and F-8).

Temporary Stormwater Section 0602
ATTACHMENT E: Request to Temporarily Seal a Feature
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Not applicable. There are no current requests to temporarily seal a feature with regard to the PEC Purgatory Road Substation Site.

Temporary Stormwater Section 0602
ATTACHMENT F: Structural Practices
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Structural practices for this project will consist of the installation of earthen interceptor/diversion dikes, silt fences, rock berms, and a stabilized construction entrance as described in Attachment D and shown on the plans (Sheet 0600 F-4).

Temporary Stormwater Section 0602
ATTACHMENT G: Drainage Area Map
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

A drainage area map for post-construction on Sheet 0600 F-3 and for existing conditions on Sheet 0600 F-4. These maps are included as attachments to the Permanent Stormwater Section – 0600.

Temporary Stormwater Section 0602
ATTACHMENT H: Temporary Sediment Pond(s) Plans and Calculations
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

No temporary sediment ponds are proposed for the PEC Purgatory Road Site. The total area of soil disturbance will be less than 10 acres. The estimated total area of disturbance is 4 acres.

Temporary Stormwater Section 0602
ATTACHMENT I: Inspection and Maintenance for BMPs
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Silt Fence

Silt fencing will be inspected weekly and after any significant rainfall. Sediment will be removed from behind the silt fence when buildup reaches 6 inches. If a section of silt fence becomes torn and cannot be repaired in such as a manner as to maintain the effectiveness of the silt fence, a second line of silt fence will be installed behind and parallel to the torn section. If a section of the fence becomes crushed or collapses and cannot be repaired, reinforced with new T-posts and repositioned, it will be immediately replaced (see Sheet 0600 F-8).

Interceptor/Diversion Dikes

Interceptor and diversion dikes will serve as both temporary and permanent BMPs.
Inspection – inspections during substation construction will be conducted weekly and after each rainfall event for erosion, slumping, deposition of silt along the up-slope toe of the dikes, or damage to vegetation. Significant silt accumulations will be removed and disposed (see Sheet 0600 F-7).

Routine Maintenance – Prompt repair of eroded areas will be conducted during routine maintenance.

Non-routine Maintenance – non-routine maintenance, such as regrading and restoring significant erosional areas or breaches of the dikes, will be conducted as needed to maintain the function and integrity of the dikes. If bare areas develop, the bare portions of the dike will be revegetated in accordance with the seeding specifications.

Rock Berms

The rock berms will serve as both temporary and permanent BMPs.
Inspection – rock berms will be inspected weekly and after each rainfall during substation operations for accumulations of silt or debris, erosion, slumping, or flow undercutting or going around the berms.

Routine Maintenance – the following routine maintenance will be conducted for the rock berms:

- removal of sediment and other debris when buildup reaches one third the height of the berm or 6 inches, whichever is greater, and disposal of the removed material in an approved manner that will not cause additional siltation;
- repair of erosion at berm ends or undercuts;
- repair of any loose wire sheathing; and
- reshaping of the berm as needed.

Non-routine Maintenance – non-routine maintenance will include major repairs or replacement of the rock berms as needed to maintain the function of the structures. Such repairs or replacement will be completed as soon as practicable after an inspection to prevent untreated runoff from substation operations from flowing to other existing downstream BMPs located between the rock berm and the ultimate site outfall.

Inspections and maintenance of BMPs will be documented on forms included in the facility's Storm Water Pollution Prevention Plan (SWP3). Records of the inspections and any maintenance or retrofits will be maintained in the facility's files for at least three years after the date of the activity.

Temporary Stormwater Section 0602
ATTACHMENT J: Schedule of Interim and Permanent Soil Stabilization Practice
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Interim stabilization of disturbed soil areas will be conducted according to the criteria specified in the TPDES Construction Stormwater Discharge Permit (No. TXR150000). Interim soil stabilization will consist of seeding disturbed areas with TCEQ-approved native grasses and providing mulch, fertilizer and watering as needed to prevent erosion and to promote rapid establishment of temporary vegetative cover.

Permanent soil stabilization shall occur after the installation of structures is completed. Permanent soil stabilization will consist of seeding disturbed areas with TCEQ-approved native grasses and providing mulch, fertilizer and watering as needed to prevent erosion and to promote establishment of permanent vegetative cover.

If a previously undisturbed area has been disturbed by the construction and will not be permanently stabilized within 21 days, PEC will provide temporary stabilization of the area in accordance with the TCEQ Technical Guidance Manual.

Form 0600

Permanent Stormwater Section

Permanent Stormwater Section
for Regulated Activities
on the Edwards Aquifer Recharge Zone
and Relating to 30 TAC §213.5(b)(4)(C), (D)(Ii), (E), and (5), Effective June 1, 1999

REGULATED ENTITY NAME: Pedernales Electric Cooperative, Inc (PEC)
Permanent best management practices (BMPs) and measures that will be used during and after construction is completed.

1. x Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.

2. x These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.

   x The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.
   __ A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is provided below

3. x Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.

4. N/A Where a site is used for low density single-family residential development and has 20% or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

   __ This site will be used for low density single-family residential development and has 20% or less impervious cover.
   __ This site will be used for low density single-family residential development but has more than 20% impervious cover.
   x This site will not be used for low density single-family residential development.

5. N/A The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g)

(relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

___ **ATTACHMENT A - 20% or Less Impervious Cover Waiver.** This site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is found at the end of this form.

___ This site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.

_x_ This site will not be used for multi-family residential developments, schools, or small business sites.

6. **ATTACHMENT B - BMPs for Upgradient Stormwater.**

_x_ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is identified as **ATTACHMENT B** at the end of this form.

___ If no surface water, groundwater or stormwater originates upgradient from the site and flows across the site, an explanation is provided as **ATTACHMENT B** at the end of this form.

___ If permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, an explanation is provided as **ATTACHMENT B** at the end of this form.

7. **ATTACHMENT C - BMPs for On-site Stormwater.**

_x_ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is identified as **ATTACHMENT C** at the end of this form.

___ If permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, an explanation is provided as **ATTACHMENT C** at the end of this form.

8. _x_ **ATTACHMENT D - BMPs for Surface Streams.** A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is provided at the end of this form. Each feature identified in the Geologic Assessment as "sensitive" or "possibly sensitive" has been addressed.

9. _x_ The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.

_x_ The permanent sealing of or diversion of flow from a naturally-occurring "sensitive" or "possibly sensitive" feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed for any naturally-occurring "sensitive" or "possibly sensitive" features on this site.

N/A **ATTACHMENT E - Request to Seal Features.** A request to seal a naturally-occurring "sensitive" or "possibly sensitive" feature, that includes a justification as to why no reasonable and practicable alternative exists, is found at the end of this form. A request and justification has been provided for each feature.

10. x **ATTACHMENT F - Construction Plans.** Construction plans and design calculations for the proposed permanent BMPs and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information have been signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed permanent BMPs and measures are provided at the end of this form. Design Calculations, TCEQ Construction Notes, all man-made or naturally occurring geologic features, all proposed structural measures, and appropriate details must be shown on the construction plans.

11. x **ATTACHMENT G - Inspection, Maintenance, Repair and Retrofit Plan.** A plan for the inspection, maintenance, repair, and, if necessary, retrofit of the permanent BMPs and measures is provided at the end of this form. The plan has been prepared and certified by the engineer designing the permanent BMPs and measures. The plan has been signed by the owner or responsible party. The plan includes procedures for documenting inspections, maintenance, repairs, and, if necessary, retrofits as well as a discussion of record keeping procedures.

12. x The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

— Pilot-scale field testing (including water quality monitoring) may be required for BMPs that are not contained in technical guidance recognized by or prepared by the executive director.

N/A **ATTACHMENT H - Pilot-Scale Field Testing Plan.** A plan for pilot-scale field testing is provided at the end of this form.

13. x **ATTACHMENT I -Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is provided at the end of this form. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity which increase erosion that results in water quality degradation.

Responsibility for maintenance of permanent BMPs and measures after construction is complete.

14. x The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.

15. x A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development,

or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **PERMANENT STORMWATER SECTION** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Brock Langley, P.E.
Print Name of Customer/Agent

R. Brock Langley
Signature of Customer/Agent

9/3/2014
Date

Permanent Stormwater Section 0600
ATTACHMENT A: 20% or Less Impervious Cover Waiver
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Not applicable. The site will not be used for multi-family residential developments, schools, or small business sites.

Permanent Stormwater Section 0600
ATTACHMENT B: BMPs for Upgradient Stormwater
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

The majority of the 1.26-acre Catchment Area A1 is located off site and upslope of the site on the south side. Stormwater runoff from this area will flow onto the project site upgradient of the planned substation area. Most of the stormwater runoff from off-site contributing areas will be diverted around the substation and allowed to flow north and west, with only minor changes in the flow regimes and directions.

Stormwater approaching the site from the single-family residential lot located to the south and from a small area within the Purgatory Road Right-of-Way (ROW) will be diverted around the substation to the west by the substation perimeter wall. Rock riprap will be placed along the exterior of the south substation wall, covering the ground between the wall and the existing privacy fence along the south property line. The purpose of the rock riprap is to reduce flow velocities and prevent erosion. A permanent earthen berm will be installed west of the southwest corner of the substation to convey the runoff past the area upslope of the sand filtration/sedimentation pond. Rock ripap will be placed at the western end of the earthen berm, where the diverted runoff will be released to overland flow.

Another permanent earthen berm will be constructed along most of the east property line, to reduce the amount of off-site run-on from the Purgatory Road ROW.

Permanent Stormwater Section 0600
ATTACHMENT C: BMPs for On-site Stormwater
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Permanent BMPs are proposed at the Purgatory Road substation site to remove suspended solids and other pollutants from stormwater runoff generated in areas where regulated activities will occur. The permanent BMPs described herein and shown on the attached construction plans are designed to control runoff and manage sediment transport at the site. The purpose of the BMPs is to prevent or reduce pollution of water in the state, including the Edwards Aquifer and surface waters that may be in hydraulic communication with the Edwards Aquifer.

PEC proposes to construct a sand filtration/sedimentation pond system for treatment of runoff from the entire area within the substation perimeter wall (see Sheets 0600 F-3 and F-5 of the Construction Plans, Attachment F). The 1.82-acre substation area will comprise the majority of new impervious cover at the site, which will total 2.05 acres. The sand filtration/sedimentation pond will be constructed by cutting and removing limestone during the initial stage of construction of the substation. The pond liner will be compacted clay. The pond will be constructed according to the details provided in the attached Construction Plans.

During the active construction phase at the site, stormwater collected in the pond excavation will be pumped out and used for dust control on the site, and for site irrigation. Excess water not needed for these beneficial uses will be pumped from the pond and discharged to the ground surface in a stable and well-vegetated area of the site that has silt fence installed downslope. Stormwater that accumulates in the pond will be allowed time for visible suspended solids to settle before the water is pumped out, and care will be taken not to pump turbid water or mud out to the discharge area. Discharge of the collected water will be in accordance with the requirements of the operator's TPDES Construction Stormwater Discharge Permit (No. TXR150000).

Pursuant to 30 TAC § 213.5(b)(4)(D)(ii)(I), permanent BMPs and measures must be designed, constructed, operated, and maintained to ensure removal of at least 80 percent of the incremental increase in the annual mass loading of TSS from the site caused by the regulated activity. As permanent BMPs, they must control the discharge of pollutants from regulated activities after completion of construction. Table 3-1 of the TCEQ publication "Edwards Aquifer Technical Guidance Manual" (RG-348), dated June 20, 2005, provides the TSS removal efficiencies for several permanent structural BMPs. To ensure that the proposed development meets the 80 percent TSS removal requirement, PEC has chosen to provide a sand filtration pond with an upstream sedimentation basin. According to RG-348, sand filters are assumed to have TSS removal efficiency of 89 percent. The filtration/sedimentation pond will be located downslope and to the west of the substation. The pond is designed to capture and treat, at minimum, the calculated Water Quality Volume (WQV), plus an additional 20 percent of WQV to account for accumulation of sediment in the pond. The Total Capture Volume of the pond system is

120 percent of the WQV, as calculated using the TCEQ's spreadsheet calculator for TSS loading and BMP design.

In addition to the sand filtration/sedimentation pond, PEC will employ vegetative filter strips downslope of a portion of the rock riprap covered fill embankments outside the north substation wall. A combination of engineered and natural vegetated filter strips will be used in this area, based on the ground slopes and minimum width requirements for the two types of filter strips. The areas proposed for the filter strips are shown on Sheet 0600 F-3.

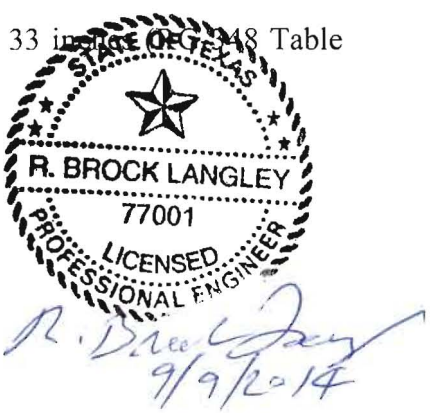
80 Percent TSS Removal Calculations

The Edwards Aquifer Rules require that the increase in TSS load resulting from the proposed activities be reduced by 80 percent. Accordingly, PEC has followed the guidelines set forth in RG-348 to determine the amount of TSS that relates to 80 percent of the incremental increase in the annual mass loading of TSS from the site caused by the regulated activity. The following equation, which is based on monitoring data from the City of Austin (presented on page 3-29 of RG-348), asserts that over the Edwards Aquifer the typical average TSS concentration from undeveloped land is 80 milligrams per liter (mg/L), and that this value increases to 170 mg/L when an area is paved or otherwise modified to increase impervious cover. Although the substation floor will be covered with a 3-inch layer of coarse gravel, PEC assumed that the entire substation area would be considered as impervious cover for the TSS loading calculation. A runoff coefficient of 0.90 (for impervious areas, per TCEQ Guidance RG-348, Section 3.3.2, Sizing Calculations) was used in the following calculations.

According to RG-348, the calculations provided to demonstrate a removal efficiency of at least 80 percent of the increase in annual mass loading of TSS from the regulated activity are to be carried out using the average annual rainfall for the county in which the project site is located. For the subject site, which is located in Comal County, the average annual rainfall total is 33 inches (RG-348 Table 3-3, *Average Annual Rainfall by County*). Accordingly, the following calculations were performed using an average annual rainfall total of 33 inches.

Equation 3.2 $L_M = (0.8 \times 0.226)(A_N \times P \times 0.9 \times 170 - A_N \times P \times 0.03 \times 80)$
Where:

- L_M = Required annual TSS removal (pounds)
- A_N = Net increase in impervious area (acres)
- P = Average annual precipitation (inches)
- The PEC substation operation consists of 5.06 acres.
- The average annual precipitation for Comal County is 33 inches (RG-348 Table 3-3).
- 0.8 = 80 percent removal requirement
- 0.226 = units conversion factor
- 0.9 = runoff coefficient for impervious areas



- 170 mg/L = TCEQ value for TSS load in runoff from impervious areas
- 0.03 = runoff coefficient for natural areas
- 80 mg/L = TCEQ value for TSS load in runoff from natural areas

As stated in Section 3.3.2 of RG-348, Equation 3.2 simplifies to:

Equation 3.3 $L_M = 27.2(A_N \times P)$

As a result, the following equations represent the minimum required annual TSS removal, in pounds, for the entire site (includes the substation plus other smaller areas of new impervious cover outside the substation wall):

$L_M = 27.2(2.05 \times 33) =$ **1,840 pounds**

The above calculations present the number of pounds of suspended solids required to be captured and treated annually on average rainfall years to meet the 80% TSS removal efficiency criteria.

TSS Load Removed by the Sand Filtration/Sedimentation Pond:

Equation 3.8 from RG-348 was used by PEC to calculate the TSS load that will be removed annually by the selected sand filtration/sedimentation pond BMP. Equation 3.8 is presented as follows:

Equation 3.8 $L_R = (BMP\ efficiency) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

Where:

- L_R = actual TSS load (pounds per year) that will be removed by the BMP
- *BMP efficiency (for a filtration/sedimentation sand filter, efficiency* = 89 percent)
- P = Average annual precipitation (inches); 33 inches
- A_I = impervious tributary area to the BMP (acres)
- A_P = pervious tributary area to the BMP (acres); *conservatively assumed to be zero*

The area within the PEC substation, A_I is 1.82 acres.

The following equation represents the annual TSS load, in pounds, removed by the sand filtration/sedimentation pond for Basin B1 (substation):

$L_R = (.89) \times 33 \times (1.82 \times 34.6 + 0 \times 0.54) =$ 1,849 pounds per year

This result (performed consistent with TCEQ's technical guidance for an average rainfall year) shows the amount of TSS that would be removed annually, on average, from the drainage area B1. Because the Edwards Aquifer Rules require removal of 80 percent,

rather than 100 percent, of the increased TSS load, only a fraction of the annual average rainfall runoff must be captured and treated in the pond. The fraction of annual runoff to be captured by the pond is calculated in the following section.

Fraction of Annual Runoff Treated by the Sand Filtration/Sedimentation Pond:

Pursuant to TCEQ guidance in RG-348, PEC calculated the fraction of annual average runoff to be treated as follows. This calculation is based on the load reduction calculated above for each of the proposed filtration/sedimentation pond and the required load reduction. Consistent with TCEQ guidance in RG-348, the following calculation assumes a constant concentration of TSS in the runoff:

Equation 3.9 $F = L_M / L_R$

Where:

F = Fraction of the annual rainfall treated by the BMP
L_R = Load removed for each BMP (from Equation 3.8, above)
L_M = Required load reduction (from Equation 3.3, above)

The following equations represent the fraction of annual rainfall treated by the substation filtration/sedimentation pond:

F = 1,840 pounds / 1,849 pounds = 0.99 or ~ 99 %

Therefore, the filtration/sedimentation pond must be designed to capture the volume of runoff that occurs from storms the maximum size of which provides 99 percent of the annual rainfall. In other words, statistically, per TCEQ Guidance RG-348, 99 percent of the annual rainfall occurs during storms in which the rainfall is 3.66 inches or less. Therefore, using these calculated values, the filtration/sedimentation pond would need to be designed with a volume equal to (3.66 inches) x (Area) x (Runoff Coefficient) to meet the 80 percent TSS removal rate.

Required Capture Volumes (Water Quality Volumes) for the Sand Filtration/Sedimentation Pond:

Per RG-348 Table 3-5 "Relationship between Fraction of Annual Rainfall and Rainfall Depth (inches)," the rainfall depth that must be treated for F = 0.99 is 3.66 inches (0.305 feet). Therefore, per RG-348 Equation 3.10, the required Water Quality Volumes (***"WQV"***) for the filtration/sedimentation pond were calculated by PEC as follows:

Equation 3.11 Runoff Coefficient = $1.72(IC)^3 - 1.97(IC)^2 + 1.23(IC) + 0.02$

Where: IC = fraction of impervious cover = 1.0 for the substation

The runoff coefficient is then calculated as follows:

Runoff coefficient = $1.72\ (1)^3 - 1.97(1)^2 + 1.23(1) + 0.02$
$= 1.0$

The equation for the sand filtration/sedimentation pond is:

WQV = 0.305 feet x 1.0 x 1.82 acres = 24,180 cubic feet

The calculations described above were performed using the TCEQ's spreadsheet for calculating TSS loading and removal and sizing BMPs. Given the sizeable WQV determined by these calculations, and the need to limit the area of the filtration/sedimentation basin due space constraints, a desired L_M was manually entered under Section 5 of the spreadsheet to reduce the size of the WQV while still capturing enough runoff volume to treat 76.5 percent of the required TSS loading from the site. Using a Desired L_M of 1760 lbs TSS, the revised calculation for the fraction of annual runoff treated is as follows:

$F = L_{M\text{-}DESIRED} / L_R$

F = 1,760 pounds / 1,849 pounds = 0.95 or ~ 95 %

Per RG-348 Table 3-5 the rainfall depth that must be treated for F = 0.95 is 2.60 inches (0.2167 feet). In addition, the post-development runoff coefficient was reduced to 0.82 in the TCEQ spreadsheet. This resulted in a reduction of the WQV, calculated as follows:

WQV = 0.2167 feet x .82 x 1.82 acres = 14,087 cubic feet

The reduced WQV provided for a reduction in the size and space requirements for the filtration/sedimentation pond, which is designed to ca volumes calculated above are necessary for each pond to remove 80 percent of the increase in annual TSS loading due to the regulated activity on site during an average rainfall year, based on the TCEQ's criteria. Per TCEQ requirements, the actual filtration/sedimentation pond volumes must be increased by 20 percent to provide additional volume for sediment storage. The following table presents a summary of calculations for the required pond capture volume and actual proposed capture volume that correlate to the pond dimensions specified in the attached Construction Plans:

Filtration/sedimentation	WQV (ft^3)	20% required Volume Increase	Required Total Capture Volume (ft^3)	Proposed Filtration/sedimentation Pond Volume (ft^3)
	14,087	x 1.2	16,904	17,277

A comparison of the required Total Capture Volume and the proposed pond volume in the last two columns of the table indicates that the proposed filtration/sedimentation pond volume will exceed the required TCV to achieve the selected removal of 76.5 percent of the increase in TSS load from the proposed development. PEC then developed additional permanent BMPs for areas outside of the substation walls to remove the remaining 3.5 percent and achieve a total removal of 80 percent of the total site increase in TSS loading.

TSS Load Removed by the Vegetative Filter Strips:

Vegetated filter strips are proposed for treatment of a portion of the runoff from the rock riprap-covered fill embankments on the north side of the substation, in Catchment Areas B2 and C2a, as shown on Sheet 0600 F-3. According to RG-348, vegetated filter strips are assumed to have TSS removal efficiency of 85 percent. The TSS removal calculations for the proposed filter strips in Areas B1 and C2a follow:

Area B2 – Engineered Vegetative Filter Strip

Equation 3.8 $L_{R,\,B2} = (.85)\ x\ \ 33\ x\ (0.05\ \ x\ 34.6 + 0.18\ x\ 0.54)$

$L_{R,\,B2} =$ **51 pounds**

$L_{R,,C2a} = (.85)\ x\ \ 33\ x\ (0.05\ \ x\ 34.6 + 0.14\ x\ 0.54)$

$L_{R,\,C2a} =$ **51 pounds**

Total TSS load removed by vegetated filter strips = 51 + 51 = 102 pounds

Summary of Required and Actual TSS Load removal:

Total required removal for the Site	**= 1840 pounds**
Calculated removal by sand filtration/sedimentation pond	= 1760 pounds
Calculated removal by vegetated filter strips	= 102 pounds
Total TSS Load removal	**= 1862 pounds**

These calculations indicate that the combination of the proposed sand filtration/sedimentation pond system and the vegetated filter strips are sufficient to remove more that 80 percent of the annual increase in TSS loading resulting from the proposed development.

Permanent Stormwater Section 0600
ATTACHMENT D: BMPs for Surface Streams and Sensitive Features
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Not applicable. No surface streams or sensitive features are present on the Site.

Permanent Stormwater Section 0600
ATTACHMENT E: Request to Temporarily Seal a Feature
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Not applicable. There are no current requests to temporarily seal a feature with regard to the Pedernales Electric Cooperative Purgatory Road Substation near New Braunfels, Texas.

The Construction Plans are attached.

Edwards Aquifer WPAP

PEC Purgatory Road Substation
Intersection of Purgatory Road and Wegner Road
Comal County, Texas

RECEIVED
SEP 18 2014
COUNTY ENGINEER

September 2014

Texas Commission on Environmental Quality
Water Pollution Abatement Plan General Construction Notes

1. Written construction notification must be given to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. Information must include the date on which the regulated activity will commence, the name of the approved plan for the regulated activity, and the name of the prime contractor and the name and telephone number of the contact person.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.

3. If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive feature may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.

4. No temporary aboveground hydrocarbon and hazardous substance storage tank system is installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

5. Prior to commencement of construction, all temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.

6. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

7. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

11. The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.

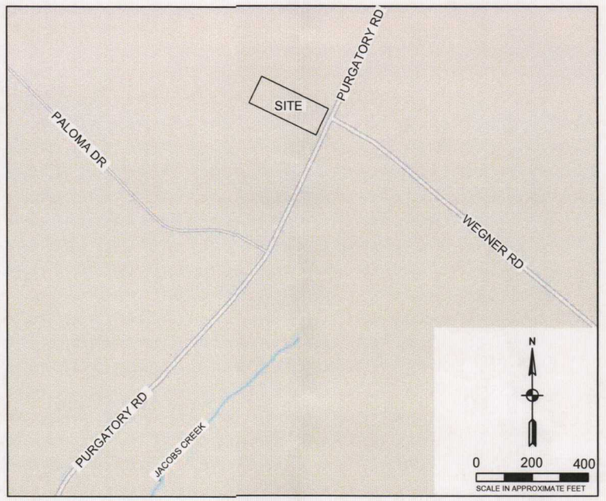
12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;

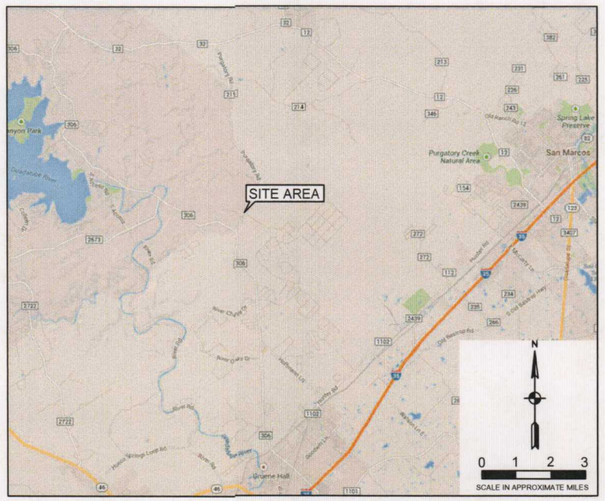
B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;

C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

Texas Commission on Environmental Quality
San Antonio Regional Office
14250 Judson Road
San Antonio, Texas 78233
Phone(210) 490-3096
Fax (210) 545-4329



SITE LOCATION MAP



AREA MAP

DRAWING INDEX:

APPROVED BY:

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER

R. Brock Langley 9-8-2014

BROCK LANGLEY, P.E.
AMEC ENVIRONMENT & INFRASTRUCTURE
DATE:

NO.	DATE	REVISION	APPRVD BY

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

SITE LOCATION MAP AND CONSTRUCTION NOTES

Comal County, Texas

By: RJR-K2 | Date: 9-8-2014 | Project No. -

amec

Sheet 0600 F-1

Plot Date: 09/09/14 - 11:01 am, Plotted by: roodr
Drawing Path: K:\CORP\Retail\AMEC\Purgatory Rd Geo Assessment\...Drawing Name: Purgatory_SS_WPAP_Cover.dwg

ALL SITE RUNOFF FLOWS TO UNNAMED TRIBUTARY OF CORDOYA HOLLOW, THEN TO GUADALUPE RIVER.

Q_{25} = 4.8 cfs
Q_{100} = 7.0 cfs

Q_{25} = 3.5 cfs
Q_{100} = 5.3 cfs

Q_{25} = 4.3 cfs
Q_{100} = 6.3 cfs

S 65°43'15" E 750.17'
(S 65°35'00" E 750.19')

N 24°15'34" E 293.77'
(N 24°23'48" E 293.81')

(S 24°24'49" W 293.36')
S 24°16'38" W 293.34'

(N 65°32'03" W 750.11')
N 65°45'13" W 750.08'

T-531

PURGATORY ROAD
(80' R.O.W.)

WEGNER ROAD

TREE CANOPY 30' PEAK
TREE CANOPY 45' PEAK
TREE CANOPY 40' PEAK
TREE CANOPY 21' PEAK
TREE CANOPY 35' PEAK
TREE CANOPY 40+' PEAK
TREE CANOPY 24' PEAK
TREE CANOPY 25' PEAK

1
1.72 ACRES

2
1.95 ACRES

3
1.95 ACRES

4
0.41 ACRES

LOT 57
EDEN RANCH, SECTION 2
5.056 ACRES
VOL. 9 PG. 120–124
MAP AND PLAT RECORDS
COMAL COUNTY, TEXAS

Q_{25} = 1.3 cfs
Q_{100} = 5.3 cfs

0.84 ACRES
OFF-SITE CONTRIBUTION AREA

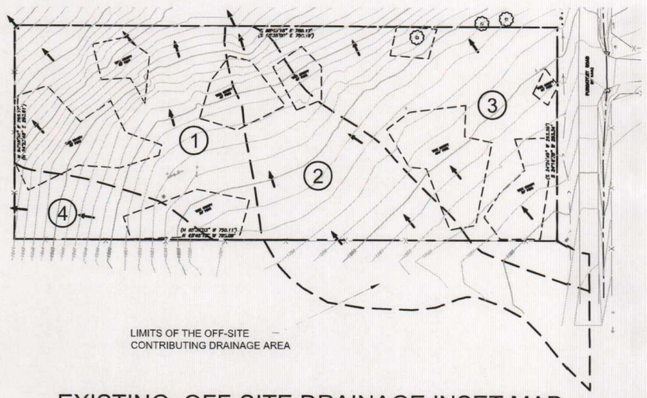
0.14 ACRES OFF-SITE
CONTRIBUTION AREA

30 15 0 30
(SCALE IN FEET)

HORIZONTAL DATUM: NAD83/NSRS 2007
VERTICAL DATUM: NAVD 88
COMBINED SCALE FACTOR: 1.00002990
BEARING BASIS: TX. LAMBERT GRID CENTRAL ZONE
DISTANCES SHOWN ARE SURFACE VALUES

LEGEND

- PK NAIL FOUND
- 1/2" IRON ROD FOUND W/ ALUMINUM CAP (UNLESS OTHERWISE NOTED)
- 5/8" IRON ROD W/ ALUMINUM CAP STAMPED "LCRA" SET
- OLD POWER POLE
- REA POLE
- H–FRAME
- GUY ANCHOR
- FENCE
- EXISTING CONTOUR – 1 FT INTERVAL
- EXISTING CONTOUR – 5 FT INTERVAL
- SURFACE RUNOFF FLOW DIRECTION
- DRAINAGE CATCHMENT BOUNDARY
- Q_{25} 25–YEAR PEAK DISCHARGE IN CUBIC FEET PER SECOND (cfs)



LIMITS OF THE OFF-SITE CONTRIBUTING DRAINAGE AREA

EXISTING OFF-SITE DRAINAGE INSET MAP

DRAINAGE AREAS

Catchment Area	Total Area (Ac)	On-Site	Off-Site
1	1.72	1.72	0
2	1.95	1.10	0.85
3	1.95	1.81	0.14
4	0.41	0.41	0
Total Catchment Area	6.03 Acres		

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER

9-8-2014

NOTE: BASE MAP AND TOPOGRAPHIC DATA PROVIDED BY L.C.R.A.

NO.	DATE	REVISION	APPRVD BY

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

EXISTING CONDITIONS DRAINAGE MAP

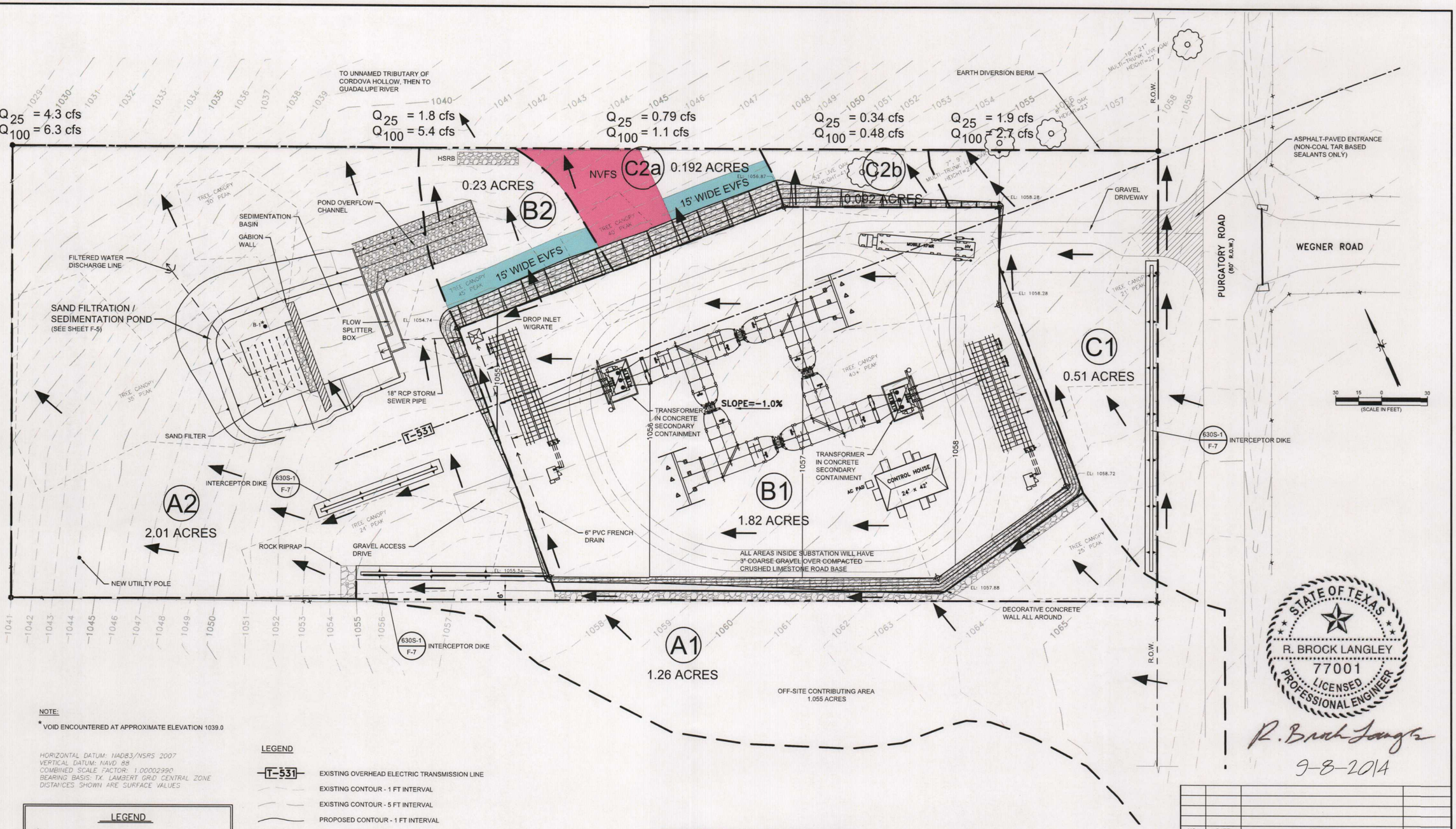
Comal County, Texas

By: RJR-K2 | Date: 9-8-2014 | Project No. -

amec

Sheet 0600 F-2

Plot Date: 09/09/14 - 10:35am, Plotted by: roodrj
Drawing Path: K:\ACAD\clients\AMEC\Purgatory Rd Geo Assessment\, Drawing Name: C-ST-PL101.dwg



NOTE:

* VOID ENCOUNTERED AT APPROXIMATE ELEVATION 1039.0

HORIZONTAL DATUM: NAD83/NSRS 2007
VERTICAL DATUM: NAVD 88
COMBINED SCALE FACTOR: 1.00002990
BEARING BASIS: TX. LAMBERT GRID CENTRAL ZONE
DISTANCES SHOWN ARE SURFACE VALUES

LEGEND

- PK NAIL FOUND
- 1/2" IRON ROD FOUND W/ ALUMINUM CAP (UNLESS OTHERWISE NOTED)
- 5/8" IRON ROD W/ ALUMINUM CAP STAMPED "LCRA" SET
- OLD POWER POLE
- REA POLE
- H-FRAME
- GUY ANCHOR
- FENCE

LEGEND

- T-531 — EXISTING OVERHEAD ELECTRIC TRANSMISSION LINE
- EXISTING CONTOUR - 1 FT INTERVAL
- EXISTING CONTOUR - 5 FT INTERVAL
- PROPOSED CONTOUR - 1 FT INTERVAL
- PROPOSED CONTOUR - 5 FT INTERVAL
- DRAINAGE CATCHMENT BOUNDARY - PROPOSED
- PROPERTY LINE
- HSRB — HIGH SERVICE ROCK BERM
- RB — ROCK RIPRAP
- STORM WATER FLOW DIRECTION
- NVFS — NATURAL VEGETATED FILTER STRIP
- EVFS — ENGINEERED VEGETATED FILTER STRIP
- Q_{25} — 25-YEAR PEAK DISCHARGE IN CUBIC FEET PER SECOND (cfs)

DRAINAGE AREAS AND IMPERVIOUS COVER

Catchment Area	Total Area (Ac)	On-Site	Off-Site	Impervious Cover (Ac) On-Site	Off-Site
A1	1.26	0.205	1.055	0.049	0.059
A2	2.01			0.018	
B1	1.821			1.821	
B2	0.23			0.04	
C1	0.51			0.048	
C2a	0.192			0.048	
C2b	0.092			0.025	
Total Catchment Area	6.115 Acres		TOTAL ON-SITE IC =	2.049 Acres	

NOTES:

1. BASE MAP AND TOPOGRAPHIC DATA PROVIDED BY L.C.R.A.
2. NO PORTION OF THIS SITE LIES WITHIN A 100-YEAR FLOODPLAIN (SOURCE: FEMA FIRM FOR COMAL COUNTY, TEXAS, MAP No. 48091C0280F, 2009).

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER

R. Brock Langley
9-8-2014

NO.	DATE	REVISION	APPRVD BY

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

SITE PLAN, DRAINAGE AND PERMANENT BMPs

Comal County, Texas

By: RJR-K2 | Date: 9-8-2014 | Project No. -

amec

Sheet 0600 F-3

Plot Date: 09/09/14 - 10:43am, Plotted by: roodj
Drawing Path: K:\ACAD\Clients\AMEC\Purgatory Rd Geo Assessment\ Drawing Name: Exhibit 2a ultimate rev2.dwg

"J" HOOK SILT FENCE EVERY 50'

"J" HOOK SILT FENCE EVERY 100'

TO UNNAMED TRIBUTARY OF CORDOVA HOLLOW, THEN TO GUADALUPE RIVER

639S-1 / F-7 ROCK BERM

642S-1 / F-7 SILT FENCE

HSRB

POND OVERFLOW CHANNEL, 12"x18" ROCK (4:1 SIDE SLOPES)

T-531

1
2.13 ACRES

2
1.95 ACRES

3
1.95 ACRES

RB

NEW UTIILTY POLE

0.846 ACRES
OFF-SITE CONTRIBUTION AREA

0.141 ACRES OFF-SITE
CONTRIBUTION AREA

641S-1 / F-7 STABILIZED CONSTRUCTION ENTRANCE

PURGATORY ROAD
(80' R.O.W.)

WEGNER ROAD

CONSTRUCTION STAGING / PARKING

C / F-8 TEMPORARY FUELING PAD W/BERM

30 15 0 30
(SCALE IN FEET)

HORIZONTAL DATUM: NAD83/NSRS 2007
VERTICAL DATUM: NAVD 88
COMBINED SCALE FACTOR: 1.00002990
BEARING BASIS: TX. LAMBERT GRID CENTRAL ZONE
DISTANCES SHOWN ARE SURFACE VALUES

LEGEND

- PK NAIL FOUND
- 1/2" IRON ROD FOUND W/ ALUMINUM CAP (UNLESS OTHERWISE NOTED)
- 5/8" IRON ROD W/ ALUMINUM CAP STAMPED "LCRA" SET
- OLD POWER POLE
- REA POLE
- H-FRAME
- GUY ANCHOR
- FENCE

LEGEND

- T-531 EXISTING OVERHEAD ELECTRIC TRANSMISSION LINE
- EXISTING CONTOUR - 1 FT INTERVAL
- EXISTING CONTOUR - 5 FT INTERVAL
- PROPOSED CONTOUR - 1 FT INTERVAL
- PROPOSED CONTOUR - 5 FT INTERVAL
- DRAINAGE CATCHMENT BOUNDARY
- PROPERTY LINE
- APPROXIMATE LIMITS OF SOIL DISTURBANCE AND SOIL STABILIZATION, CONSTRUCTION PHASE
- SF SILT FENCE
- ID INTERCEPTOR DIKE
- HSRB HIGH SERVICE ROCK BERM
- RB ROCK BERM
- STORM WATER FLOW DIRECTION
- CONSTRUCTION STAGING / PARKING

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER

R. Brock Langley

9-8-2014

NOTE: BASE MAP AND TOPOGRAPHIC DATA PROVIDED BY L.C.R.A.

NO.	DATE	REVISION	APPRVD BY

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

TEMPORARY STORM WATER BMPs PLAN

Comal County, Texas

By: RJR-K2	Date: 9-8-2014	Project No. -

amec

Sheet 0600 F-4

Plot Date: 09/09/14 - 10:44am Plotted by: roodl
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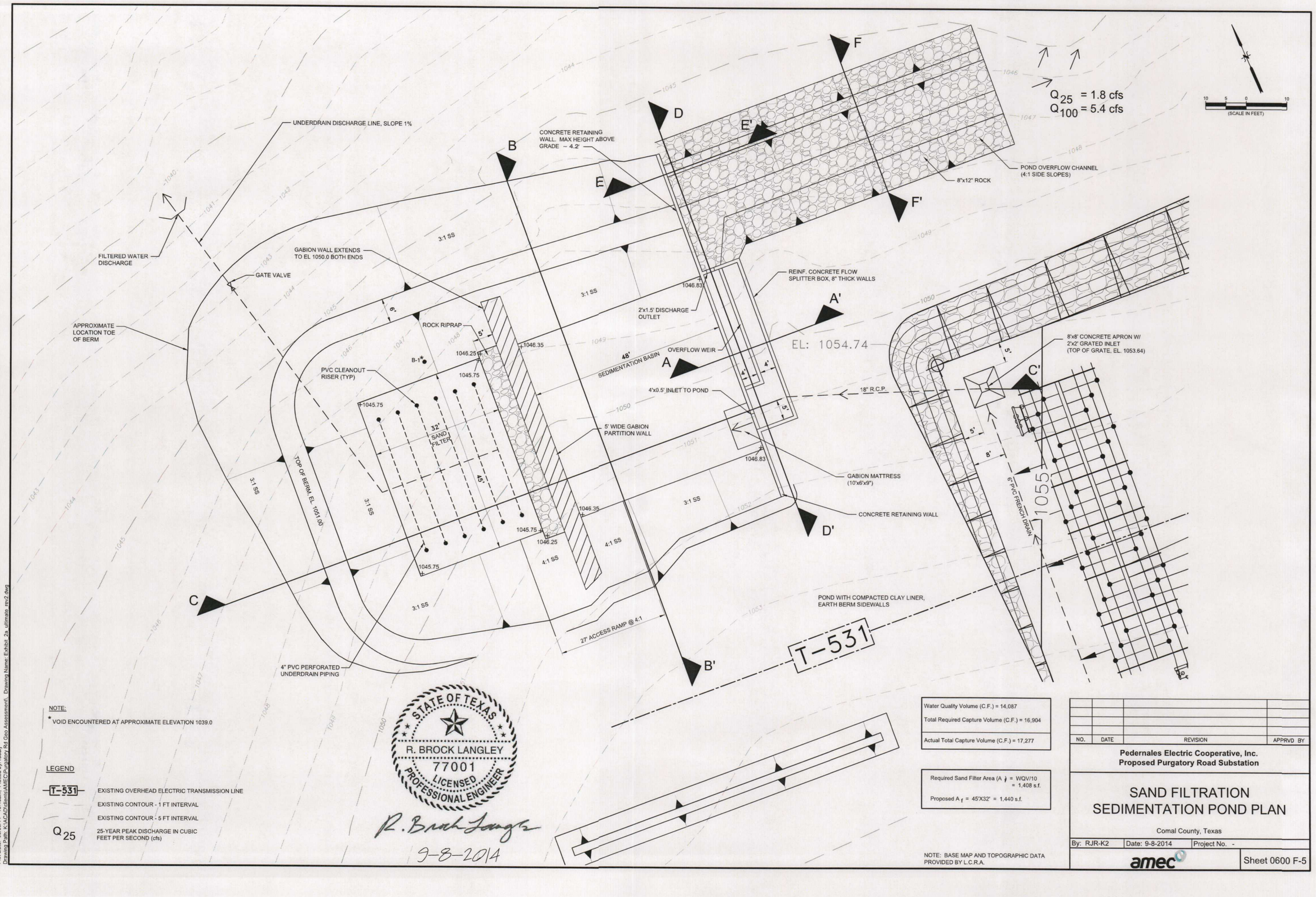

NOTE:

* VOID ENCOUNTERED AT APPROXIMATE ELEVATION 1039.0

LEGEND

T-531	EXISTING OVERHEAD ELECTRIC TRANSMISSION LINE
	EXISTING CONTOUR - 1 FT INTERVAL
	EXISTING CONTOUR - 5 FT INTERVAL
Q_{25}	25-YEAR PEAK DISCHARGE IN CUBIC FEET PER SECOND (cfs)

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R. Brock Langley

9-8-2014

Water Quality Volume (C.F.) =	14,087
Total Required Capture Volume (C.F.) =	16,904
Actual Total Capture Volume (C.F.) =	17,277

Required Sand Filter Area (A_f) = WQV/10 = 1,408 s.f.

Proposed A_f = 45'X32' = 1,440 s.f.

NOTE: BASE MAP AND TOPOGRAPHIC DATA PROVIDED BY L.C.R.A.

NO.	DATE	REVISION	APPRVD BY

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

SAND FILTRATION SEDIMENTATION POND PLAN

Comal County, Texas

By: RJR-K2	Date: 9-8-2014	Project No. -

amec

Sheet 0600 F-5

Plot Date: 09/09/14 - 10:45am, Plotted by: roodj
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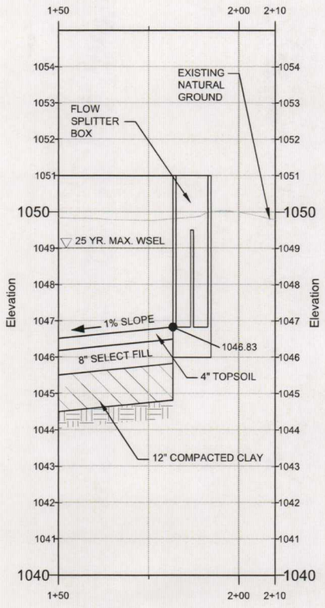
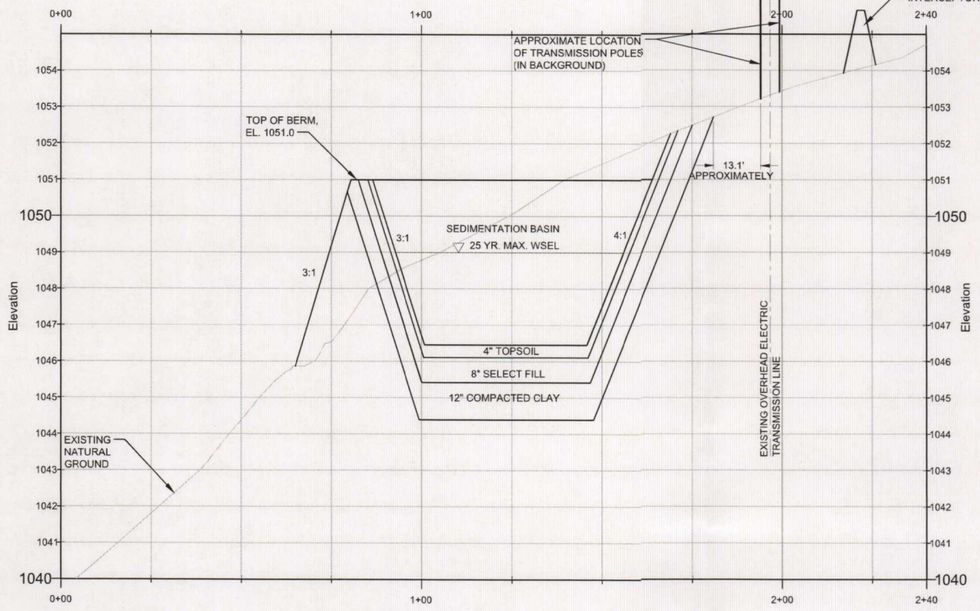


SECTION A-A'
SCALE: 1"=20' (H)
1"=2'(V)



SECTION B-B'
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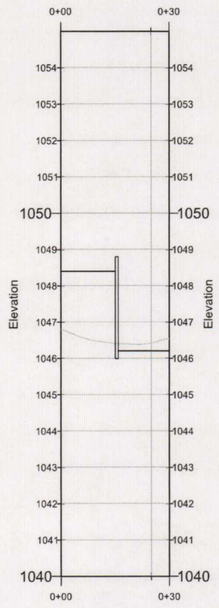

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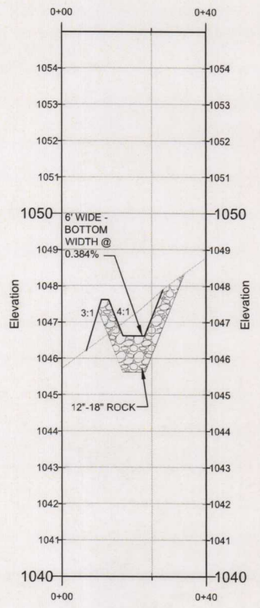

SECTION F-F'
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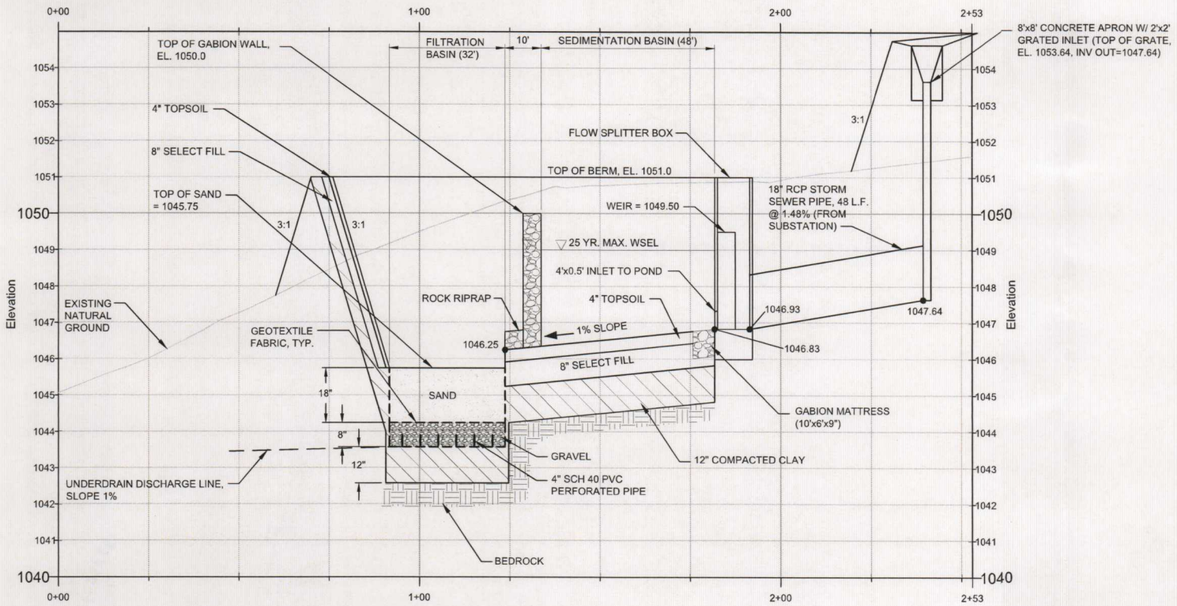

SECTION C-C'
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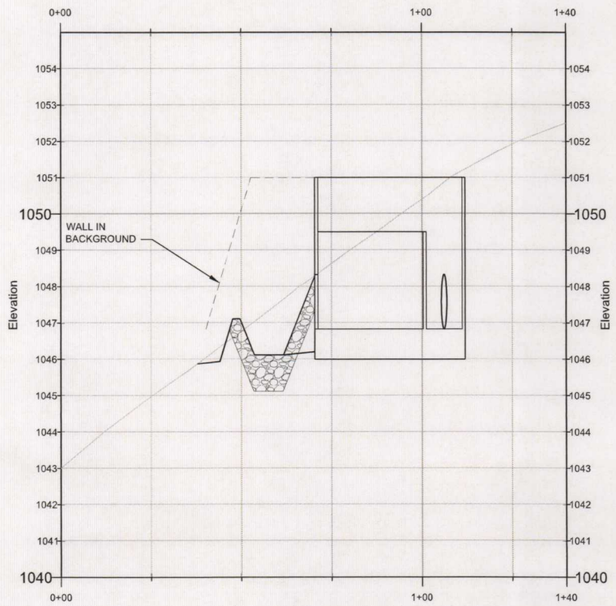

SECTION D-D'
SCALE: 1"=20' (H)
1"=2'(V)

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R. Brock Langley
9-8-2014

NO.	DATE	REVISION	APPRVD BY

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Proposed Purgatory Road Substation

FILTRATION AND SEDIMENTATION POND SECTIONS

Comal County, Texas

By: RJR-K2	Date: 9-8-2014	Project No. -

amec

Sheet 0600 F-6

Plot Date: 09/09/14 - 10:46am, Plotted by: roodj
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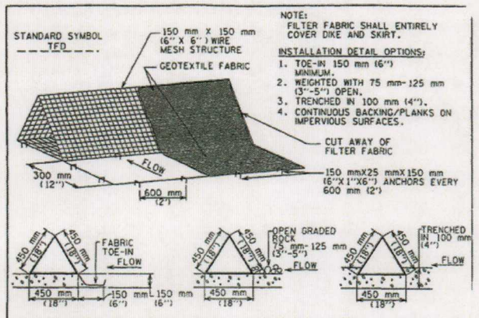
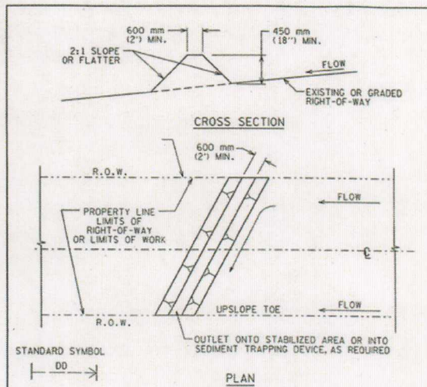


NOTE:
FILTER FABRIC SHALL ENTIRELY COVER DIKE AND SKIRT.

INSTALLATION DETAIL OPTIONS:
1. TOE-IN 150 mm (6") MINIMUM.
2. WEIGHTED WITH 75 mm-125 mm (3"-5") OPEN.
3. TRENCHED IN 100 mm (4").
4. CONTINUOUS BACKING/PLANKS ON IMPERVIOUS SURFACES.

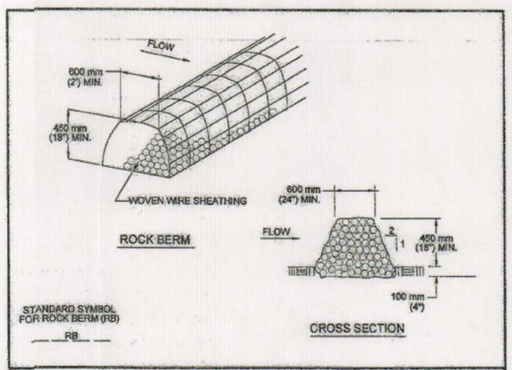
GENERAL NOTES
1. DIKES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT DIKE.
2. THE FABRIC COVER AND SKIRT SHALL BE A CONTINUOUS WRAPPING OF GEOTEXTILE. THE SKIRT SHALL BE A CONTINUOUS EXTENSION OF THE FABRIC ON THE UPSTREAM FACE.
3. THE SKIRT SHALL BE WEIGHTED WITH A CONTINUOUS LAYER OF 75-125 mm (3-5") OPEN GRADED ROCK OR TOED-IN 150 mm (6") WITH MECHANICALLY COMPACTED MATERIAL. OTHERWISE, THE ENTIRE STRUCTURE SHALL BE TRENCHED IN 100 mm (4").
4. DIKES AND SKIRT SHALL BE SECURELY ANCHORED IN PLACE USING 150 mm (6") WIRE STAPLES ON 600 mm (2') CENTERS ON BOTH EDGES AND SKIRT, OR STAKE USING 10M 19½") DIAMETER RE-BAR WITH TEE ENDS.
5. FILTER MATERIAL SHALL BE LAPPED OVER ENDS 150 mm (6") TO COVER DIKE TO DIKE JOINTS. JOINTS SHALL BE FASTENED WITH GALVANIZED SHOAT RINGS.
6. THE DIKE STRUCTURE SHALL BE MW40-150 mmX 150 mm (6 GA. 6"X6") WIRE MESH, 450 mm (18") ON A SIDE.
7. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
8. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150 mm (6") AND DISPOSED OF IN A MANNER WHICH WILL NOT CAUSE ADDITIONAL SILTATION.
9. AFTER THE DEVELOPMENT SITE IS COMPLETLY STABILIZED, THE DIKES AND ANY REMAINING SILT SHALL BE REMOVED. SILT SHALL BE DISPOSED OF AS INDICATED IN GENERAL NOTE 8 ABOVE.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	TRIANGULAR SEDIMENT FILTER DIKE	
ADOPTED 3-27-00	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 628S



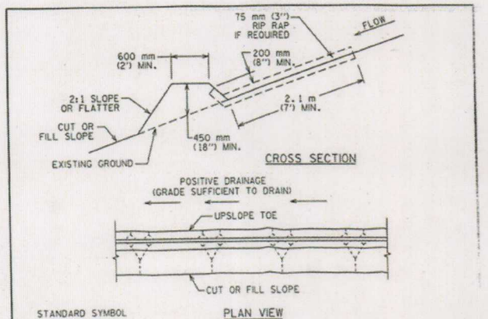
GENERAL NOTES :
1. ALL DIKES SHALL BE MACHINE COMPACTED.
2. ALL DIVERSION DIKES SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
3. a. DIVERTED RUNOFF FROM A PROTECTED OR STABILIZED AREA SHALL HAVE ITS OUTLET FLOW DIRECTED TO AN UNDISTURBED STABILIZED AREA OR INTO A LEVEL SPREADER OR GRADE STABILIZATION STRUCTURE.
   b. DIVERTED RUNOFF FROM A DISTURBED OR EXPOSED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE, SUCH AS A ROCK BERM, BRUSH BERM, STONE OUTLET STRUCTURE, SEDIMENT TRAP OR SEDIMENT BASIN OR TO AN AREA PROTECTED BY ANY OF THESE PRACTICES.
4. UNLESS OTHERWISE SPECIFIED, EROSION STABILIZATION SHALL BE OPEN GRADED ROCK 75-125 mm (3-5") IN DIAMETER PLACED IN A 75 mm (3") THICK LAYER AND EMBEDDED INTO THE SOIL.
5. INSPECTION SHALL BE CONDUCTED WEEKLY OR AFTER EACH RAINFALL EVENT.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	INTERCEPTOR DIKE	
ADOPTED 3-27-00	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 630S-1



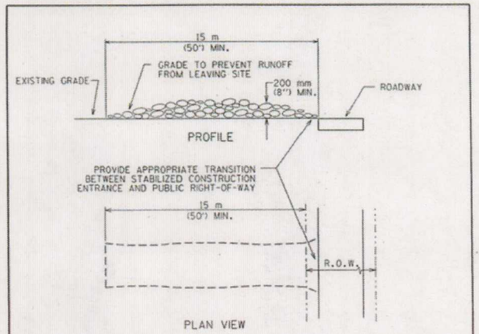
NOTES:
1. USE ONLY OPEN GRADED ROCK 75 to 125 mm (3 to 5") DIAMETER FOR ALL CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 25 mm (1") OPENING AND MINIMUM WIRE DIAMETER OF 12.9 mm (20 GAUGE).
3. THE ROCK BERM SHALL BE INSPECTED DAILY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE/WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SEDIMENT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. IF SEDIMENT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR 150 mm (6"), WHICHEVER IS LESS, THE SEDIMENT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SEDIMENTION PROBLEM.
5. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	ROCK BERM	
Diane B. Kazen P.E. 8/24/2010 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 639S-1



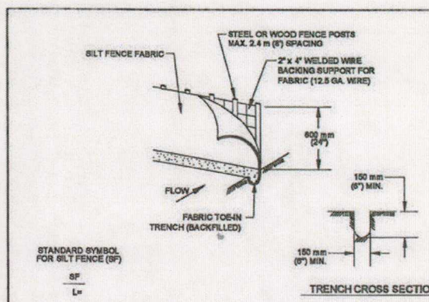
GENERAL NOTES :
1. ALL DIKES SHALL BE MACHINE COMPACTED.
2. ALL DIVERSION DIKES SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
3. a. DIVERTED RUNOFF FROM A PROTECTED OR STABILIZED AREA SHALL HAVE ITS OUTLET FLOW DIRECTED TO AN UNDISTURBED STABILIZED AREA OR INTO A LEVEL SPREADER OR GRADE STABILIZATION STRUCTURE.
   b. DIVERTED RUNOFF FROM A DISTURBED OR EXPOSED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE, SUCH AS A ROCK BERM, BRUSH BERM, STONE OUTLET STRUCTURE, SEDIMENT TRAP OR SEDIMENT BASIN OR TO AN AREA PROTECTED BY ANY OF THESE PRACTICES.
4. UNLESS OTHERWISE SPECIFIED, EROSION STABILIZATION SHALL BE OPEN GRADED ROCK 75 TO 125 mm (3 TO 5 Inches) IN DIAMETER EMBEDDED IN SOIL SURFACE.
5. INSPECTION SHALL BE CONDUCTED WEEKLY OR AFTER EACH RAINFALL EVENT.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	DIVERSION DIKE	
ADOPTED 3-27-00	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 622S-1



NOTES:
1. STONE SIZE: 75-125 mm (3-5") OPEN GRADED ROCK.
2. LENGTH: AS EFFECTIVE BUT NOT LESS THAN 15 m (50').
3. THICKNESS: NOT LESS THAN 200 mm (8").
4. WIDTH: NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS/EGRESS.
5. WASHING: WHEN NECESSARY, VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE AND DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
6. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AS WELL AS REPAIR AND CLEAN OUT OF ANY MEASURE DEVICES USED TO TRAP SEDIMENT. ALL SEDIMENTS THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
7. DRAINAGE: ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	STABILIZED CONSTRUCTION ENTRANCE	
ADOPTED 5/23/00	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 641S-1



1. STEEL OR WOOD POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 300 mm (12 INCHES). IF WOOD POSTS CANNOT ACHIEVE 300 mm (12 Inches) DEPTH, USE STEEL POSTS.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH MUST BE A MINIMUM OF 150 mm (6 Inches) DEEP AND 150 mm (6 Inches) WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE FABRIC SHOULD BE SECURELY FASTENED TO EACH STEEL OR WOOD SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL OR WOOD FENCE POST.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150 mm (6 Inches). THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	SILT FENCE	
ADOPTED 9/1/2011	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S-1

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER

R. Brock Langley
9-8-2014

NO.	DATE	REVISION	APPRVD BY

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

CONSTRUCTION DETAILS - TEMPORARY STORM WATER BMPs

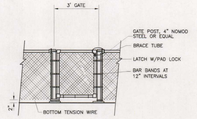
Comal County, Texas

By: RJR-K2	Date: 9-8-2014	Project No. -

amec

Sheet 0600 F-7

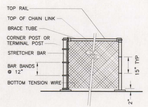
Plot Date: 09/09/14 - 10:48am, Plotted by: roodfj
Drawing Path: K:\ACAD\clients\AMEC\Purgatory Rd Geo Assessment\ Drawing Name: C-ZD-DT101.dwg



CHAIN LINK FENCE GATE

DETAIL A

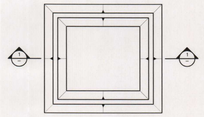
NTS



CHAIN LINK FENCE

DETAIL B

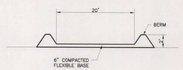
NTS



TEMPORARY FUELING PAD WITH BERM

DETAIL C

NTS



TEMPORARY FUELING PAD WITH BERM

SECTION 1

NTS

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER

R. Brock Langley

9-8-2014

NO.	DATE	REVISION	APPRVD BY

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

CONSTRUCTION DETAILS

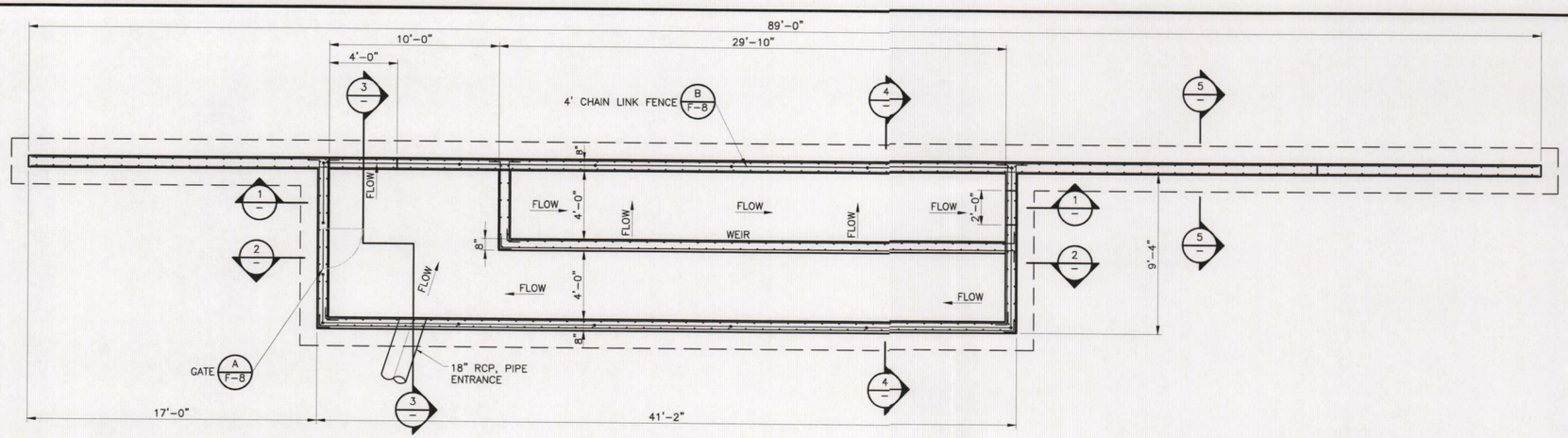
Comal County, Texas

By: RJR-K2 | Date: 9-8-2014 | Project No. -

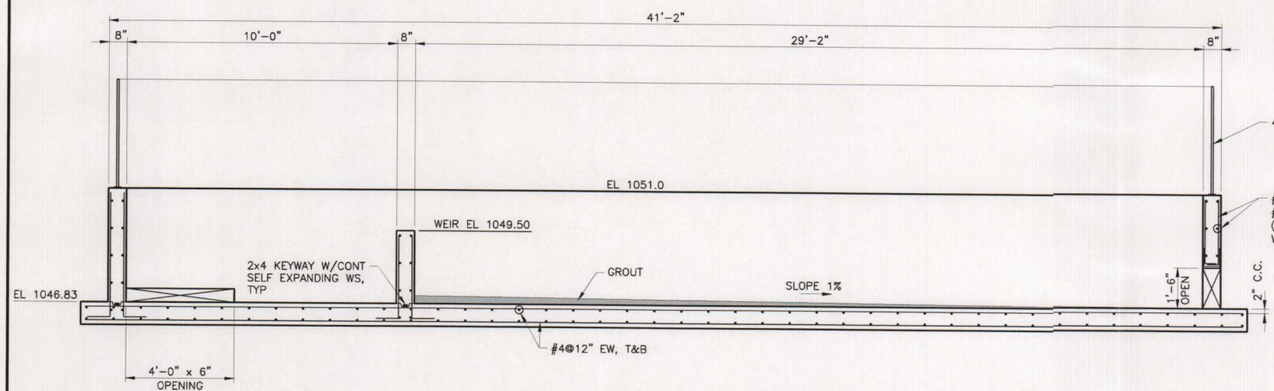
amec

Sheet 0600 F-8

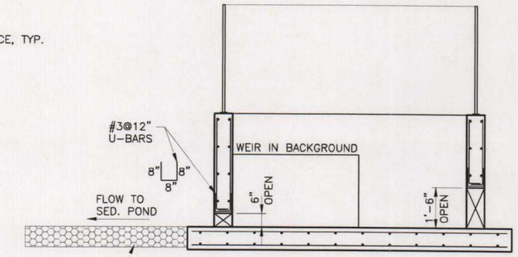
Plot Date: 09/08/14 - 10:45am - Plotted by: user
File Name: K:\PROJECTS\Pedernales\PEC Gas Assessment - Purgatory\Drawings\Purgatory Substation\Construction Details\Purgatory Substation Construction Details.dwg



SPLITTER BOX
PLAN
1/4" = 1'-0"

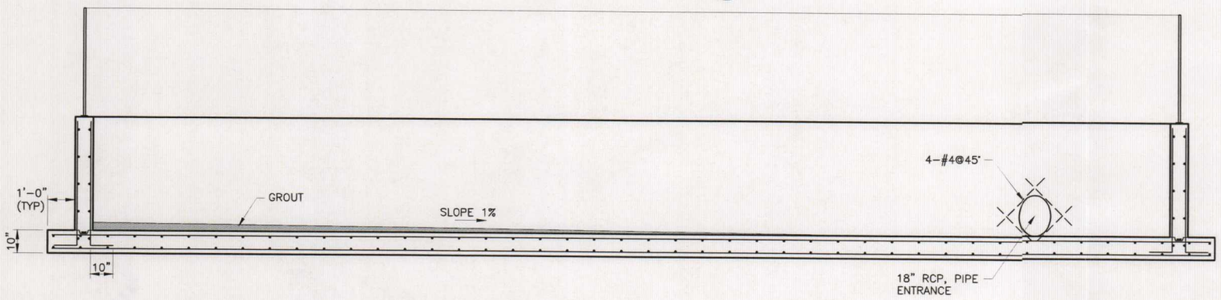


SECTION 1
3/8" = 1'-0"

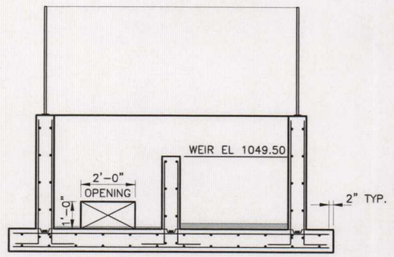


SECTION 3
3/8" = 1'-0"

SECTION 5
3/8" = 1'-0"



SECTION 2
3/8" = 1'-0"



SECTION 4
3/8" = 1'-0"

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED
PROFESSIONAL ENGINEER

R. Brock Langley
9-8-2014

NO.	DATE	REVISION	APPRVD BY

Pedernales Electric Cooperative, Inc.
Proposed Purgatory Road Substation

CONSTRUCTION DETAILS

Comal County, Texas

By: RJR-K2 | Date: 9-8-2014 | Project No.

amec

Sheet 0600 F-9

Plot Date: 09/09/14 - 10:50am. Plotted by: roodj
Drawing Path: K:\ACAD\Clients\AMEC\Purgatory Rd Geo Assessment\ Drawing Name: S-SPLITTER-BOX.dwg

Permanent Stormwater Section 0600
ATTACHMENT G: BMP Inspection, Maintenance, Repair and Retrofit Plan
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

The following procedures have been developed and shall be followed by PEC to address maintenance issues related to the proposed permanent stormwater BMPs, as prescribed in TCEQ document RG-348, Section 3.5.5 (2005).

Inspections:

The following inspection practices apply to the sand filtration/sedimentation pond and the vegetated filter strips.

All of the storm water BMPs must be inspected at least twice per year (once during or immediately following wet weather) to evaluate facility operation. The sand filter filtration pond must be inspected on a quarterly basis and after large storms for the first year of operation, and at least twice per year thereafter. This intensive monitoring of the filtration pond is intended to ensure proper operation and provide maintenance personnel with a feel for the operational characteristics of the filter. If PEC deems necessary, more frequent inspections will be scheduled.

During each inspection, erosion areas inside and the downstream of the BMP must be indentified and repaired or re-vegetated as soon as practicable. With each inspection, any damage to the structural elements of the system (pipes, concrete drainage structures, retaining walls, etc.) must be identified and repaired as soon as practicable. Significant accumulations of debris or litter identified during the inspections should be removed as soon as practicable. Particular attention should be paid to debris that may clog the openings in the flow splitter box or that cause water to flow unevenly from the sedimentation basin into the sand filtration basin. Cracks, voids, and undermining should be patched/filled to prevent additional structural damage. Trees and root systems should be removed to prevent growth in cracks and joints that can cause structural damage.

Maintenance:

Sediment Removal: Sediment will be removed from the sand filtration/sedimentation pond when sediment depth approaches 20 percent of the Water Quality Volume ("WQV"), as described in RG-348 or when proper functioning of inlet or outlet structures is impaired. Sediment shall be cleared from all inlet and outlet structures. The depth of sediment relative to the 20 percent WQV will be determined using fixed vertical sediment depth markers installed on the bottom of the pond.

Sediment will be removed from the upstream face of rock berms when the depth of sediment reaches 6 inches.

Sediment will be removed from vegetated filter strips when accumulations have the potential to cause channeling rather than maintaining sheet flow across the filter strips.

Media Replacement (Filtration Pond):

Once the draw-down time of the filtration pond begins to exceed 48 hours, the pond shall be monitored quarterly after rain events to evaluate draw-down. When the draw-downtime exceeds 72 hours, non-routine or corrective maintenance shall be performed. The corrective maintenance shall include removal of the upper layer of filtration media (sand) and replacement with new materials. Any discolored sand shall also be removed and replaced. In filters that have been regularly maintained, this is generally limited to the top 2 to 3 inches of the filter media. Removed materials shall be disposed properly in accordance with TCEQ requirement for solid waste disposal.

Special Note Regarding Protection of the Sand Filter: Certain construction and maintenance practices are essential to efficient operation of the filter. Exposure to heavy sediment loads that clog the filter media should be avoided. All exposed areas should be stabilized to minimize sediment loads. Runoff from any un-stabilized construction areas upstream of the ponds should be treated via a separate sediment system that bypasses the filter media. If construction occurs on-site, PEC shall notify the engineer for that project that this site is under a BMP maintenance plan so that adequate design measures can be taken to avoid potential contamination of the filtration pond. After the sand filter has been cleaned or replaced, the top of the sand bed shall be level, to ensure proper distribution of flow through the filter media.

Filter Underdrain Piping in Sand Filter:

PEC shall clean all underdrain piping networks to remove any sediment buildup once every 2 years, or more frequently as needed to maintain the design drawdown time of 24 hours. More frequent cleaning may be required if longer draw-down times are observed.

Mowing: Grass areas in and around all BMP ponds must be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas, especially in the detention pond due its close proximity to Cypress Creek Road. When mowing of grass is performed, a mulching mower should be used, or grass clippings shall be collected and removed.

Erosion Control: Earthen berms, channels, access roads, and other site areas with the potential for soil erosion and sediment transport will be inspected frequently and after significant rain events to identify erosion problems. Eroded areas will be repaired in a timely manner by soil stabilization practices such as seeding and mulching, placing rock riprap, installing erosion control fabric, or a combination of these practices as appropriate for specific areas.

Debris and Litter Removal: Debris and litter will be removed regularly by on-site personnel.

Nuisance Control: Regular inspection and maintenance of the retention pond forebays will generally mitigate nuisance issues. Debris and litter will be removed as described earlier.

PEC will be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without new limitation, a new property owner) or the ownership of the property is transferred to the other entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.

Access to the Site by TCEQ or Other Authorized Inspectors

The site will be accessible to TCEQ inspectors or other authorized inspectors during normal business hours. Access to the substation for inspection of BMPs will be granted to TCEQ or other authorized inspectors via arrangement with the Site Manager.

Responsible Party Information

The names, titles/qualifications, and contact information for the party(ies) responsible for maintaining the BMPs are provided in Appendix A to this Plan.

Engineer's Certification

This plan was prepared by Brock Langley, P.E. of AMEC Environment & Infrastructure, Inc., the designer of the BMPs, in accordance with the provisions of 30 TAC §213.5(b)(4)(C)(vii) and the *Edwards Aquifer Technical Manual*, on behalf of Pedernales Electric Cooperative, Inc (PEC) - Purgatory Road Substation.

R. Brock Langley
Signature of Engineer

9/9/14
Date

Owner/Responsible Party Certification

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

Carl Barnes
Name of PEC Representative

Signature of PEC Representative

9/9/14
Date

APPENDIX A

RESPONSIBLE PARTY INFORMATION

Name	Title/Qualifications	Phone Number
Carl Barnes	PEC Substation Project Administrator	830-385-1440

Permanent Stormwater Section 0600
ATTACHMENT H: Pilot-Scale Field Testing Plan
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

Not applicable. The TCEQ Technical Guidance Manual was used to design permanent BMPs and measures for this site.

Permanent Stormwater Section 0600
ATTACHMENT I: Measures for Minimizing Surface Stream Contamination
Pedernales Electric Cooperative, Inc. – Purgatory Road Substation

As described in Attachment C (BMPs for Onsite Stormwater), the development the Purgatory Road Substation will result in a net increase of 2.05 acres of impervious. However, due to the proposed filtration/sedimentation pond and vegetative filter strips previously described in Attachments C and D, surface streams will not be contaminated with TSS loading. In addition to these permanent stormwater treatment structures, development will not result in a significant increase in storm runoff discharge rates from the site, and flow velocities will remain approximately the same as for existing, undeveloped condition.

The development of the site for the electric substation will not result in a significant change in the natural drainage patterns at the site, and therefore the impact to receiving streams is expected to be minimal.

Administrative Forms

Agent Authorization (Form 0599)
Application Fee Form (Form 0574)
Check
Core Data Form (Form 10400)

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I Carl Barnes
,
Print Name

Substation Project Administrator,
Title - Owner/President/Other

of Pedernales Electric Cooperative, Inc,
Corporation/Partnership/Entity Name

have authorized Brock Langley, P.E.
Print Name of Agent/Engineer

of AMEC Environment & Infrastructure, Inc.
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Applicant's Signature

Date 9/8/14.

THE STATE OF Texas §

County of Blanco §

BEFORE ME, the undersigned authority, on this day personally appeared Carl Barnes known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 8th day of September 2014

NOTARY PUBLIC

Tommie J. Engler

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 07-25-16

TOMMIE J. ENGLER
Notary Public, State of Texas
My Commission Expires
JULY 25, 2016

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Application Fee Form

NAME OF PROPOSED REGULATED ENTITY: Purgatory Road Substation
REGULATED ENTITY LOCATION: New Braunfels, Comal County, Texas
NAME OF CUSTOMER: Pedernales Electric Cooperative, Inc.
CONTACT PERSON: Carl Barnes PHONE: (830) 385-1440
(Please Print)

Customer Reference Number (if issued): CN CN6013279 (nine digits)

Regulated Entity Reference Number (if issued): RN _____ (nine digits)

Austin Regional Office (3373) ☐ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362) ☐ Bexar **X** Comal ☐ Medina ☐ Kinney ☐ Uvalde

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment.** This payment is being submitted to (Check One):

☐ **Austin Regional Office**

☐ **Mailed to TCEQ:**
TCEQ – Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

X San Antonio Regional Office

☐ **Overnight Delivery to TCEQ:**
TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
512/239-1278

Site Location (Check All That Apply): **X** Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	5.06 Acres	$ 5000.00
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature

9/8/14
Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Application Fee Schedule
30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications
Contributing Zone Plans and Modifications

PROJECT	PROJECT AREA IN ACRES	FEE
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

PROJECT	COST PER LINEAR FOOT	MINIMUM FEE MAXIMUM FEE
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

PROJECT	COST PER TANK OR PIPING SYSTEM	MINIMUM FEE MAXIMUM FEE
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

PROJECT	FEE
Exception Request	$500

Extension of Time Requests

PROJECT	FEE
Extension of Time Request	$150

Pedernales Electric Cooperative, Inc.
P.O. Box 1
Johnson City, Texas 78636-0001
(830) 868-7155

OPERATING ACCOUNT

VENDOR NUMBER	VENDOR NAME		CHECK NUMBER
105999	TCEQ		531804
INVOICE NUMBER	**INVOICE DATE**	**DESCRIPTION**	**NET AMOUNT**
090814	09/08/2014	Application Fee	5,000.00
Total Net Amount			5,000.00

THIS CHECK IS VOID WITHOUT A WATERMARK - HOLD TO LIGHT TO VIEW - RUB HEAT SENSITIVE CHECKMARK TO SEE COLOR DISAPPEAR AND REAPPEAR

Pedernales Electric Cooperative, Inc.
P.O. Box 1
Johnson City, Texas 78636-0001
(830) 868-7155

CHECK DATE	CHECK NO.	CHECK AMOUNT
09/08/2014	531804	$5,000.00

JP Morgan Chase Bank, N.A.
Dallas, TX
88-88/1113

FIVE THOUSAND AND 00/100**

VOID AFTER 90 DAYS

PAY TO THE ORDER OF:

TCEQ
12100 Park 35 Circle
Austin TX 78753

Authorized signature - Two signatures required.

SIGNATURE HAS A COLORED BACKGROUND - BORDER CONTAINS MICROPRINTING

⑈531804⑈ ⑆111300880⑆ 630000269 1⑈

TCEQ

TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided)*

☒ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Attachments ☒Yes ☐No — **Describe Any Attachments:** *(ex. Title V Application, Waste Transporter Application, etc.)* Water Pollution Abatement Plan (WPAP)

3. Customer Reference Number *(if issued)*: CN 601327927 - C.R.

Follow this link to search for CN or RN numbers in Central Registry**

4. Regulated Entity Reference Number *(if issued)*: RN

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy):

6. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check only one of the following:*

☐Owner ☐Operator ☒Owner & Operator
☐Occupational Licensee ☐Responsible Party ☐Voluntary Cleanup Applicant ☐Other: _____

7. General Customer Information

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐Change in Legal Name (Verifiable with the Texas Secretary of State) ☒ No Change**

If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.

8. Type of Customer:	☒ Corporation	☐ Individual	☐ Sole Proprietorship- D.B.A
☐ City Government	☐ County Government	☐ Federal Government	☐ State Government
☐ Other Government	☐ General Partnership	☐ Limited Partnership	☒ Other: Cooperative

9. Customer Legal Name *(If an individual, print last name first: ex: Doe, John)*: Pedernales Electric Cooperative, Inc.

If new Customer, enter previous Customer below

End Date:

10. Mailing Address: 201 South Avenue F - P.O. Box 1 - C.R.

City	State	ZIP	ZIP + 4
Johnson City	TX	78636	78636-0001 - C.R.

11. Country Mailing Information *(if outside USA)*:

12. E-Mail Address *(if applicable)*: carl.barnes@peci.com

13. Telephone Number: (830) 868-7155

14. Extension or Code:

15. Fax Number *(if applicable)*: (830) 868-4744

16. Federal Tax ID *(9 digits)*: 740828412

17. TX State Franchise Tax ID *(11 digits)*:

18. DUNS Number *(if applicable)*:

19. TX SOS Filing Number *(if applicable)*:

20. Number of Employees

☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher

21. Independently Owned and Operated?

☒ Yes ☐ No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information ☐ No Change** *(See below)*

**If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.

23. Regulated Entity Name *(name of the site where the regulated action is taking place)*: Purgatory Road Substation

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*	791 Purgatory Rd							
	Purgatory Rd and Intersection of Wegner Rd - Comal County							
	City	New Braunfels	**State**	TX	**ZIP**	78132	**ZIP + 4**	UNO - [illegible]
25. Mailing Address:	P.O. Box 1							
	201 South Ave. F							
	City	Johnson City	**State**	TX	**ZIP**	78636	**ZIP + 4**	78636-0001 - CB

26. E-Mail Address:	carl.barnes@peci.com

27. Telephone Number	**28. Extension or Code**	**29. Fax Number** *(if applicable)*
(830) 385-1440		(830) 868-4994

30. Primary SIC Code (4 digits)	**31. Secondary SIC Code** (4 digits)	**32. Primary NAICS Code** (5 or 6 digits)	**33. Secondary NAICS Code** (5 or 6 digits)
4911		221122	

34. What is the Primary Business of this entity? *(Please do not repeat the SIC or NAICS description.)*

Electric service provider

Questions 34 – 37 address geographic location. Please refer to the instructions for applicability.

35. Description to Physical Location:	The site entrance is located on the west side of Purgatory Road, at the intersection of Purgatory Road and Wegner Road, approximately 0.70 miles northeast of the Purgatory Road/FM 306 split.

36. Nearest City	**County**	**State**	**Nearest ZIP Code**
New Braunfels	Comal	TX	78132

37. Latitude (N) In Decimal:	29.855377	**38. Longitude (W) In Decimal:**	-98.114006

Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	51	19.63	98	06	50.41

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
☐ New Source Review – Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS	☐ Sludge
☒ Stormwater	☐ Title V – Air	☐ Tires	☐ Used Oil	☐ Utilities
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Brock Langley	**41. Title:**	Senior Engineer

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 344-3145		(512) 795-8423	brock.langley@amec.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 9 and/or as required for the updates to the ID numbers identified in field 39.

(See the Core Data Form instructions for more information on who should sign this form.)

Company:	Pedernales Electric Cooperative	**Job Title:**	Substation Project Administrator
Name *(In Print)*:	Carl Barnes	**Phone:**	(830) 385-1440
Signature:	[signature]	**Date:**	9/8/14

amec

RECEIVED

NOV 20 2014

COUNTY ENGINEER

RECEIVED TCEQ
2014 NOV -7 PM 3:18
SAN ANTONIO REGION

November 6, 2014
Project No. AU1412

Mr. Alex Grant
Texas Commission on Environmental Quality
14250 Judson Rd.
San Antonio, Texas 78233-4480

Re: Pedernales Electric Cooperative, Inc., Purgatory Road Substation, Comal County, Texas Water Pollution Abatement Plan, Response to the Texas Commission on Environmental Quality (TCEQ) Comments Received November 3, 2014, 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer, Edwards Aquifer Protection Program ID No. 13-14090901

Dear Mr. Grant:

AMEC Environment & Infrastructure, Inc. (AMEC) prepared this letter and attachments on behalf of Pedernales Electric Cooperative, Inc. (PEC). This letter provides responses to each comment by the Texas Commission on Environmental Quality (TCEQ) received on November 3, 2014 regarding the Water Pollution Abatement Plan (WPAP) application submitted to your office on September 9, 2014. Each TCEQ comment is repeated in this letter, followed by PEC's response to the comment. Attachments to this letter are listed on a separate sheet in front of the attachments.

TCEQ Comment #1
According to Comal County records, the site listed in the application has an address within the City of New Braunfels. Line 2 of the General Information form submitted with the project states the project is not located within any city's limits or ETJ. Please verify and submit a corrected General Information Form if necessary.

PEC Response: According to the Comal County tax records, the site listed in the application does have an address listed in New Braunfels, but according to the most recent Extraterritorial Jurisdiction (ETJ) map of the City of New Braunfels the site is located outside the ETJ, to the north. AMEC contacted the Planning and Zoning Department of New Braunfels, and they confirmed that the site at 791 Purgatory Road, Comal County, Texas 78132 is not within the city limits nor ETJ of New Braunfels or any other city. An annotated copy of the New Braunfels ETJ map is attached to this letter.

TCEQ Comment #2
The temporary construction entrance details listed on sheet 0600 F-7 do not include the use of geotextile fabric. Please review the temporary construction entrance section of RG-348, Complying with the Edwards Aquifer Rules: *Technical Guidance on Best Management Practices,* located on pages 1-63 through 1-65, and submit a corrected detail sheet that includes the geotextile fabric.

PEC Response: The construction detail for the stabilized construction entrance has been revised to show geotextile fabric between the rock and the underlying soil. A copy of revised plan sheet 0600 F-7 is attached to this letter.

Environment & Infrastructure
3520 Executive Center Drive, Suite 200, Austin, TX 78731 USA
Tel: 512.795.0360 - Fax: 512.795.8423

TCEQ Comment #3
The 6 inch PVC French drain system that is displayed on schematic sheet 0600 F-3 does not have a detail sheet associated with it. Please provide a detail sheet that displays the dimensions of the drain system, liners, fill materials, etc.

PEC Response: A detail showing the French drain system dimensions, liners and fill material has been added to Sheet 0600 F-8, and references to the detail have been added to Sheets 0600 F-3 and 0600 F-5. Copies of revised plan sheets 0600 F-3, 0600 F-5, and 0600 F-8 are attached to this letter.

TCEQ Comment #4
Section C-C as listed on sheet 0600 F-6 shows a slight drop in elevation from the top of the sedimentation chamber floor to the top of the sand within the sand filtration chamber. As water flows into the sand filter area this elevation change could cause erosion of the sand at the point of impact potentially causing a gouging effect. Please revise the current design to prevent erosion at this location.

PEC Response: Section C-C' on Sheet 0600 F-6 has been revised to change the 0.5-foot elevation change at this location from a vertical drop to a slope, and to include rock riprap on the ground surface of the area to prevent gouging and erosion of the sand by water flowing through the gabion wall. A copy of the revised plan sheet 0600 F-6 is attached to this letter.

TCEQ Comment #5
Section C-C shows the underdrain discharge pipe has a 1% slope after exiting the filtration basin but the underdrain piping within the filtration chamber does not appear to be designed with the required 1% slope. Please verify and revise the design drawings as needed.

PEC Response: Section C-C' on Sheet 0600 F-6 has been revised to indicate a 1% slope in the lateral underdrain pipes and the central collector pipe within the sand filtration underdrain, and 1% slopes on the finished surface of the compacted clay liner. A copy of the revised plan sheet 0600 F-6 is attached to this letter.

TCEQ Comment #6
The clay liner specifications were not included on the design sheets. Please provide the specifications for the clay liner that will be used.

PEC Response: Specifications for the clay liner have been added adjacent to Section C-C' on plan sheet 0600 F-6. A copy of the revised plan sheet 0600 F-6 is attached to this letter.

TCEQ Comment #7
The schematic drawings did not include a sediment depth marker within the sedimentation chamber. Please revise the schematic drawings to include the location of the sediment depth marker.

PEC Response: The design drawings have been revised to include a sediment depth marker within the sedimentation chamber. A construction detail for the depth marker has been added to plan sheet 0600 F-8, and the depth marker location is shown on revised plan sheet 0600 F-5. Copies of revised plan sheets 0600 F-5 and 0600 F-8 are attached to this letter.

Please contact me at 512-344-3145 or Mr. Carl Barnes of PEC at 830-385-1440, if you have any questions or require additional information. Thank you.

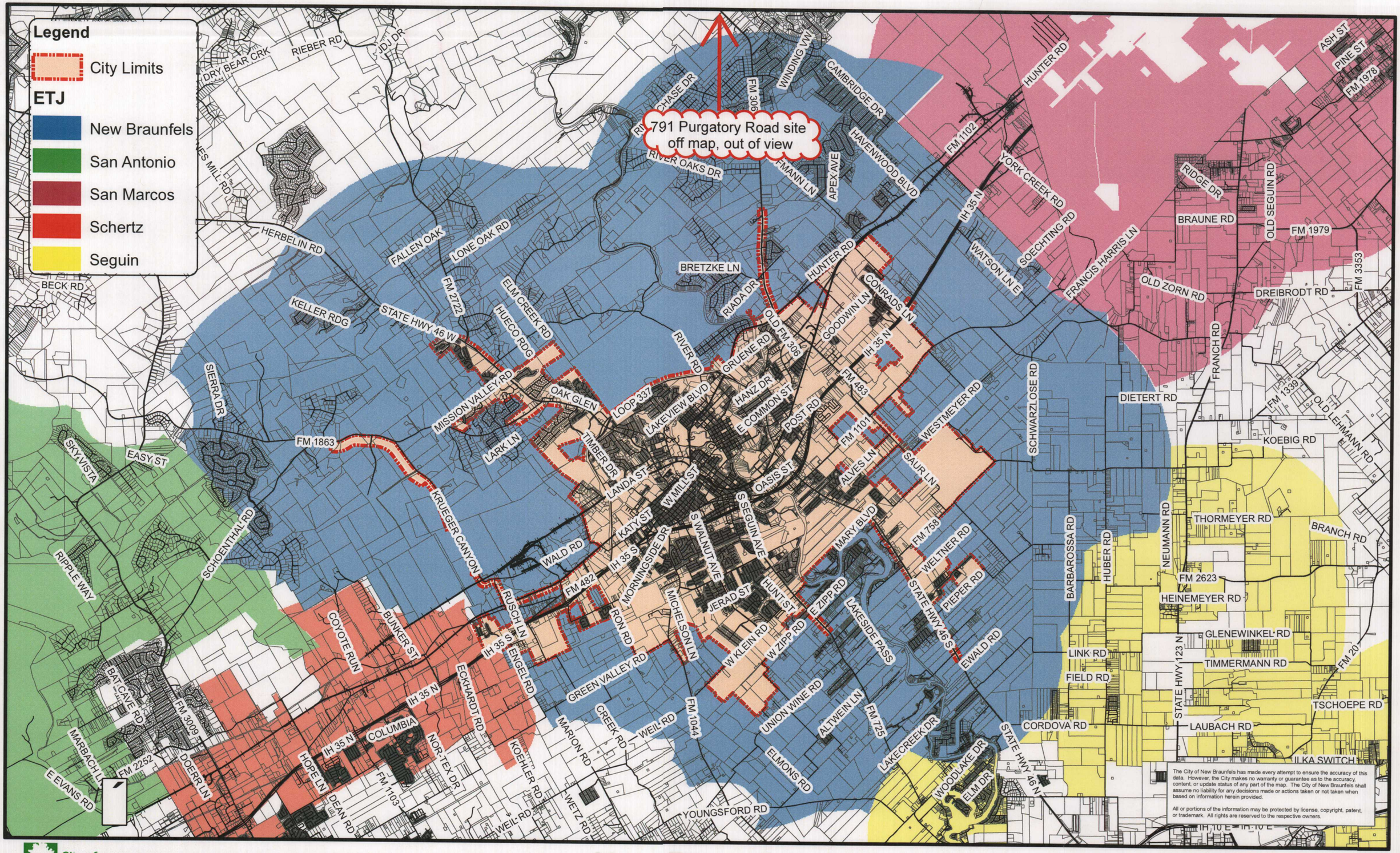
Sincerely,
AMEC Environment & Infrastructure, Inc.

R. Brock Langley, P.E. (TX# 77001)
Senior Engineer

cc: Carl Barnes, Pedernales Electric Cooperative, Inc.
Mike Almendarez, Lower Colorado River Authority

ATTACHMENTS

1. City of New Braunfels ETJ map (2009), annotated
2. Revised Plan Sheet 0600 F-3
3. Revised Plan Sheet 0600 F-5
4. Revised Plan Sheet 0600 F-6
5. Revised Plan Sheet 0600 F-7
6. Revised Plan Sheet 0600 F-8



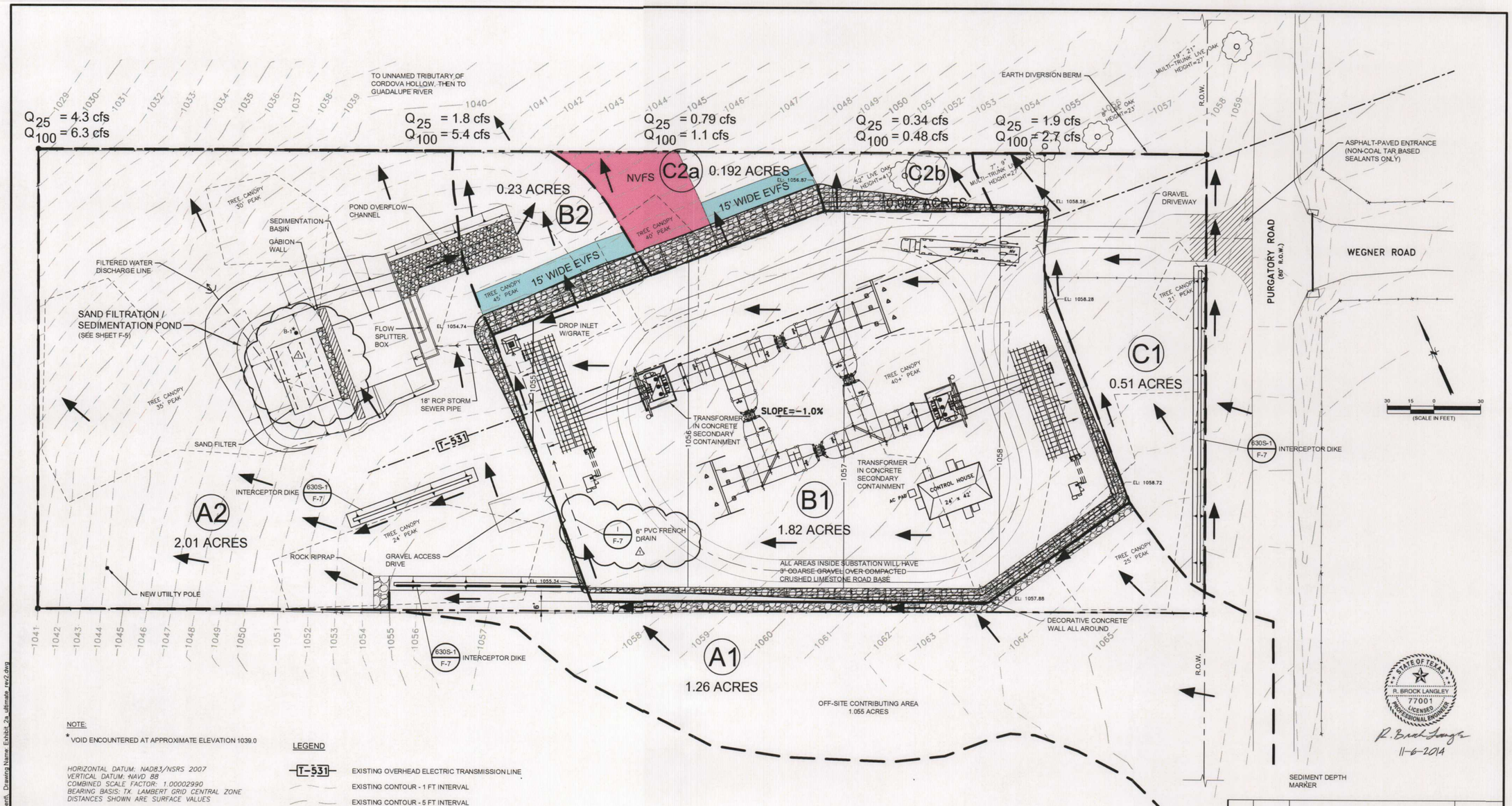
City of New Braunfels

PLANNING

New Braunfels
3.5 Mile Extraterritorial Jurisdiction

Map created on December 7, 2009

0 5,500 11,000 22,000 Feet



NOTE:

* VOID ENCOUNTERED AT APPROXIMATE ELEVATION 1039.0

HORIZONTAL DATUM: NAD83/NSRS 2007
VERTICAL DATUM: NAVD 88
COMBINED SCALE FACTOR: 1.00002990
BEARING BASIS: TX. LAMBERT GRID CENTRAL ZONE
DISTANCES SHOWN ARE SURFACE VALUES

LEGEND

- PK NAIL FOUND
- 1/2" IRON ROD FOUND W/ ALUMINUM CAP (UNLESS OTHERWISE NOTED)
- 5/8" IRON ROD W/ ALUMINUM CAP STAMPED "LCRA" SET
- OLD POWER POLE
- REA POLE
- H-FRAME
- GUY ANCHOR
- FENCE

LEGEND

- T-531 — EXISTING OVERHEAD ELECTRIC TRANSMISSION LINE
- EXISTING CONTOUR - 1 FT INTERVAL
- EXISTING CONTOUR - 5 FT INTERVAL
- PROPOSED CONTOUR - 1 FT INTERVAL
- PROPOSED CONTOUR - 5 FT INTERVAL
- DRAINAGE CATCHMENT BOUNDARY - PROPOSED
- PROPERTY LINE
- RB — ROCK RIPRAP
- STORM WATER FLOW DIRECTION
- NVFS — NATURAL VEGETATED FILTER STRIP
- EVFS — ENGINEERED VEGETATED FILTER STRIP
- Q_{25} — 25-YEAR PEAK DISCHARGE IN CUBIC FEET PER SECOND (cfs)
- Q_{100} — 100-YEAR PEAK DISCHARGE IN CUBIC FEET PER SECOND (cfs)

DRAINAGE AREAS AND IMPERVIOUS COVER

Catchment Area	Total Area (Ac)	On-Site	Off-Site	Impervious Cover (Ac) On-Site	Off-Site
A1	1.26	0.205	1.055	0.049	0.059
A2	2.01			0.018	
B1	1.821			1.821	
B2	0.23			0.04	
C1	0.51			0.048	
C2a	0.192			0.048	
C2b	0.092			0.025	
Total Catchment Area	6.115 Acres		TOTAL ON-SITE IC =	2.049 Acres	

NOTES:

1. BASE MAP AND TOPOGRAPHIC DATA PROVIDED BY L.C.R.A.
2. NO PORTION OF THIS SITE LIES WITHIN A 100-YEAR FLOODPLAIN (SOURCE: FEMA FIRM FOR COMAL COUNTY, TEXAS, MAP No. 48091C0280F, 2009).

STATE OF TEXAS — R. BROCK LANGLEY — 77001 — LICENSED PROFESSIONAL ENGINEER
11-6-2014

NO.	DATE	REVISION	APPRVD BY
1	11-6-2014	ADDED DTLS. I & J; UPDATED LATERALS IN FILTRATION BASIN	RBL

Pedernales Electric Cooperative, Inc.
Purgatory Road Substation

SITE PLAN, DRAINAGE AND PERMANENT BMPs

Comal County, Texas

By: RJR-K2 | Date: 10-8-2014 | Project No. -

amec

Sheet 0600 F-3

Ltr.	Date	Revision	By	Chkd.	Appd.

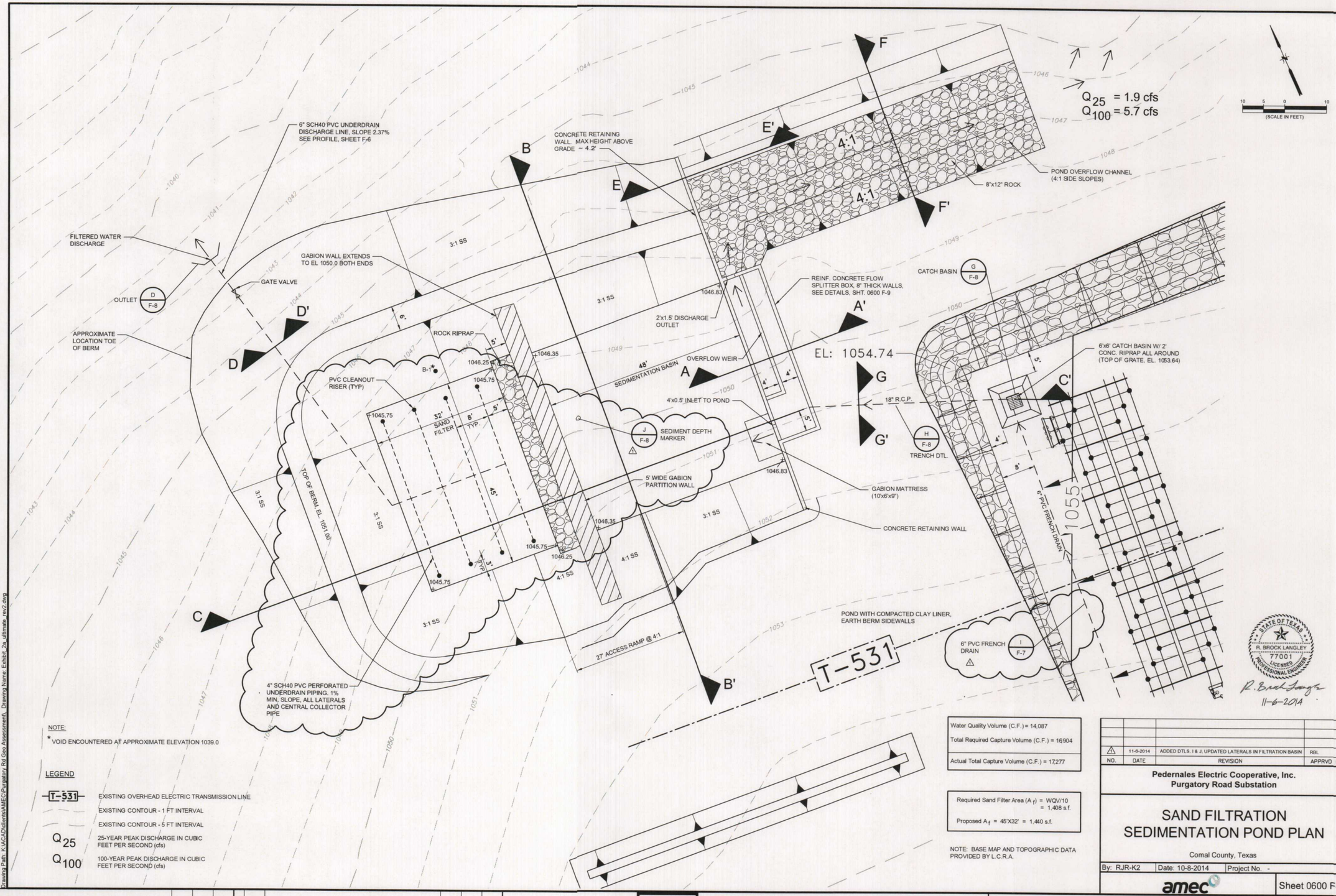
DRAWN K2-RR
CHECKED RBL
APPROVED RBL

PEDERNALES ELECTRIC COOPERATIVE, INC.
JOHNSON CITY, TEXAS
PURGATORY ROAD SUBSTATION

SITE PLAN, DRAINAGE AND PERMANENT BMPs

DATE 10-8-2014
SCALE AS-NOTED
DWG. NO. 2-S-189-C-6

Plot Date: 11/06/14 - 3:36pm, Plotted by: rsodi
Drawing Path: K:\CAD\Scientific\AMEC\Purgatory Rd Geo Assessment\ Drawing Name: Exhibit 2a ultimate rev2.dwg



NOTE:
* VOID ENCOUNTERED AT APPROXIMATE ELEVATION 1039.0

LEGEND

T-531	EXISTING OVERHEAD ELECTRIC TRANSMISSION LINE
	EXISTING CONTOUR - 1 FT INTERVAL
	EXISTING CONTOUR - 5 FT INTERVAL
Q_{25}	25-YEAR PEAK DISCHARGE IN CUBIC FEET PER SECOND (cfs)
Q_{100}	100-YEAR PEAK DISCHARGE IN CUBIC FEET PER SECOND (cfs)

Water Quality Volume (C.F.) =	14,087
Total Required Capture Volume (C.F.) =	16904
Actual Total Capture Volume (C.F.) =	17,277

Required Sand Filter Area (A_f) = WQV/10 = 1,408 s.f.

Proposed A_f = 45'X32' = 1,440 s.f.

NOTE: BASE MAP AND TOPOGRAPHIC DATA PROVIDED BY L.C.R.A.

NO.	DATE	REVISION	APPRVD BY
1	11-6-2014	ADDED DTLS. I & J, UPDATED LATERALS IN FILTRATION BASIN	RBL

Pedernales Electric Cooperative, Inc.
Purgatory Road Substation

SAND FILTRATION SEDIMENTATION POND PLAN

Comal County, Texas

By: RJR-K2 | Date: 10-8-2014 | Project No. -

amec

Sheet 0600 F-5

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED PROFESSIONAL ENGINEER
11-6-2014

Ltr.	Date	Revision	By	Chkd.	Appd.

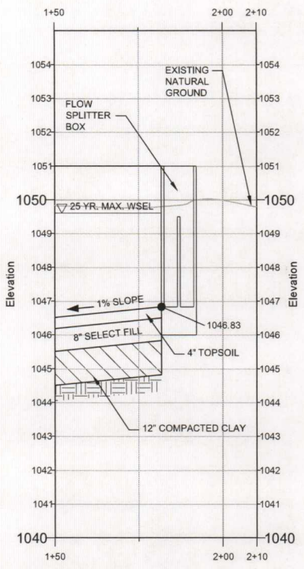
DRAWN K2-RR
CHECKED RBL
APPROVED RBL

PEDERNALES ELECTRIC COOPERATIVE, INC.
JOHNSON CITY, TEXAS
PURGATORY ROAD SUBSTATION

SAND FILTRATION SEDIMENTATION POND PLAN

DATE 10-8-2014
SCALE AS-NOTED
DWG. NO. 2-S-189-C-8

Plot Date: 11/06/14 - 3:36pm Plotted by: rsody
Drawing Path: K:\ACAD\clients\AMEC\Purgatory Rd Geo Assessment\ Drawing Name: Exhibit 2a_ultimate_rev2.dwg



SECTION A-A'
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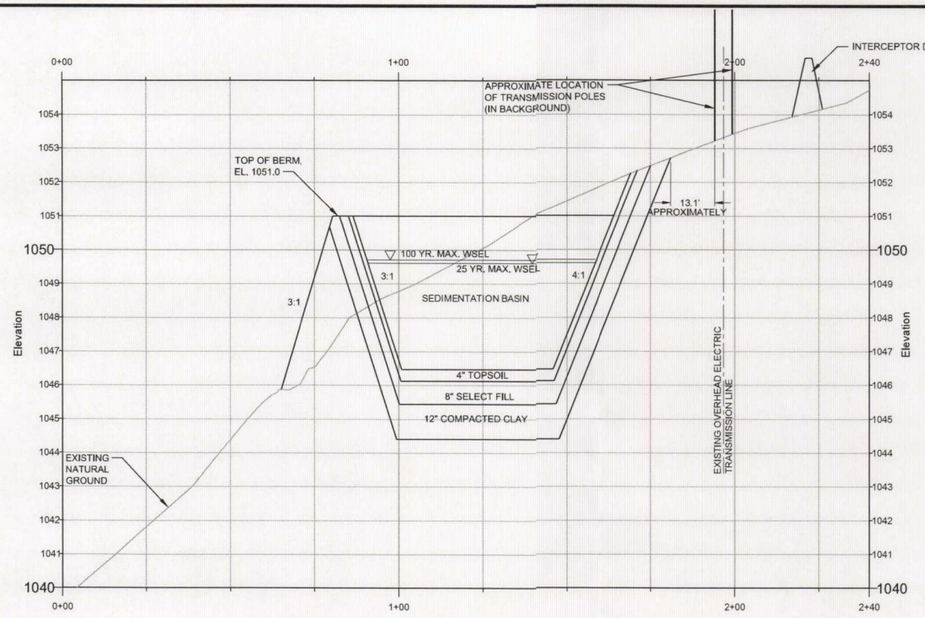
1"=2'(V)



SECTION B-B'
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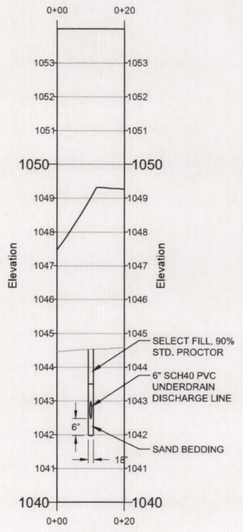
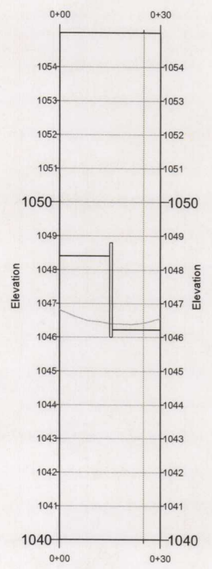
1"=2'(V)



SECTION D-D'
SCALE: 1"=20' (H)
1"=2'(V)



SECTION E-E'
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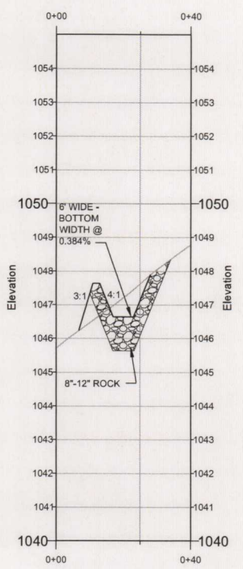
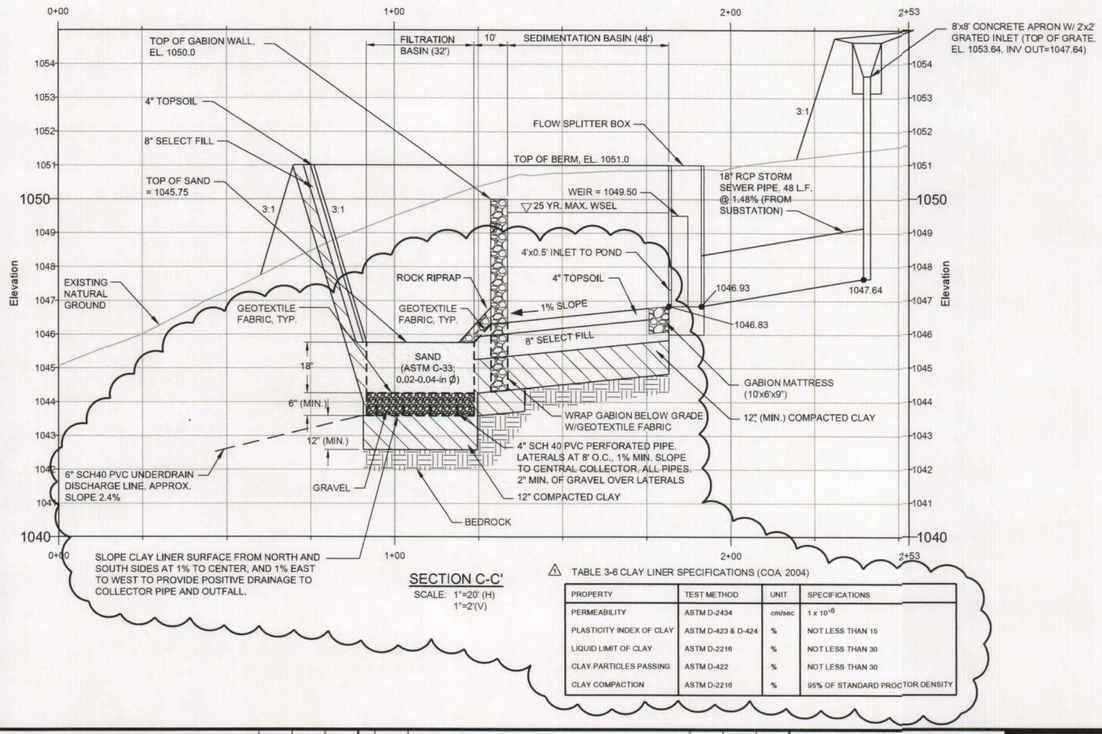
1"=2'(V)



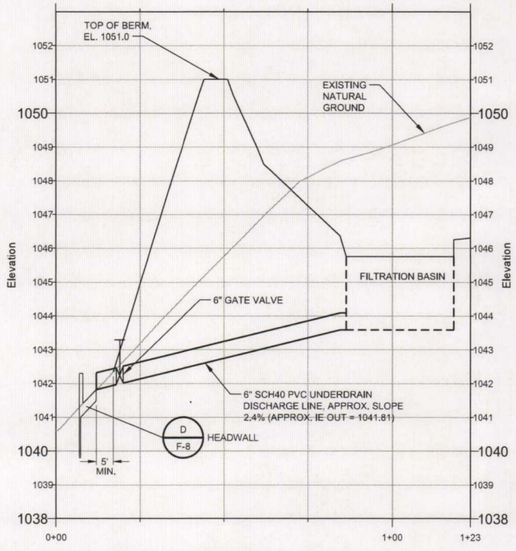
SECTION F-F'
SCALE: 1"=20' (H)
1"=2'(V)



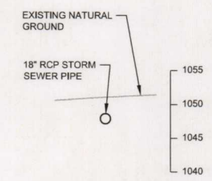
SECTION C-C'
SCALE: 1"=20' (H)
1"=2'(V)

⚠ TABLE 3-6 CLAY LINER SPECIFICATIONS (COA 2004)

PROPERTY	TEST METHOD	UNIT	SPECIFICATIONS
PERMEABILITY	ASTM D-2434	cm/sec	1×10^{-6}
PLASTICITY INDEX OF CLAY	ASTM D-423 & D-424	%	NOT LESS THAN 15
LIQUID LIMIT OF CLAY	ASTM D-2216	%	NOT LESS THAN 30
CLAY PARTICLES PASSING	ASTM D-422	%	NOT LESS THAN 30
CLAY COMPACTION	ASTM D-2216	%	95% OF STANDARD PROCTOR DENSITY



PROFILE - SAND FILTRATION POND UNDERDRAIN DISCHARGE LINE
SCALE: 1"=20' (H)
1"=2'(V)



SECTION G-G'
SCALE: 1"=10'

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED PROFESSIONAL ENGINEER
11-6-2014

NO.	DATE	REVISION	APPRVD BY
⚠	11-6-2014	ADDED CLAY LINER SPECIFICATIONS, UPDATED SECTION C-C'	RBL

Pedernales Electric Cooperative, Inc.
Purgatory Road Substation

FILTRATION AND SEDIMENTATION POND SECTIONS

Comal County, Texas

By: RJR-K2 | Date: 10-8-2014 | Project No. -

amec

Sheet 0600 F-6

Ltr.	Date	Revision	By	Chkd.	Appd.

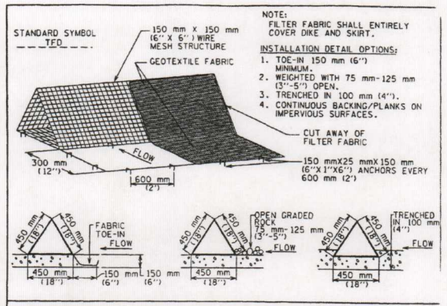
DRAWN K2-RR
CHECKED RBL
APPROVED RBL

PEDERNALES ELECTRIC COOPERATIVE, INC.
JOHNSON CITY, TEXAS
PURGATORY ROAD SUBSTATION

FILTRATION AND SEDIMENTATION POND SECTIONS

DATE 10-8-2014
SCALE AS-NOTED
DWG. NO. 2-S-189-C-9

Plot Date: 11/06/14 - 4:48pm. Plotted by: rood
Drawing Path: K:\ACAD\Clients\AMEC\Purgatory Rd Geo Assessment\ Drawing Name: Exhibit -2a_ultimate -rev2.dwg

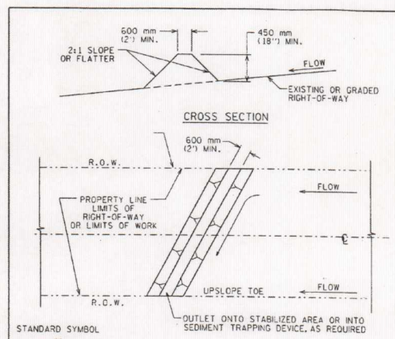


NOTE:
FILTER FABRIC SHALL ENTIRELY COVER DIKE AND SKIRT.

INSTALLATION DETAIL OPTIONS:
1. TOE-IN 150 mm (6") MINIMUM.
2. WEIGHTED WITH 75 mm-125 mm (3"-5") OPEN.
3. TRENCHED IN 100 mm (4").
4. CONTINUOUS BACKING/PLANKS ON IMPERVIOUS SURFACES.

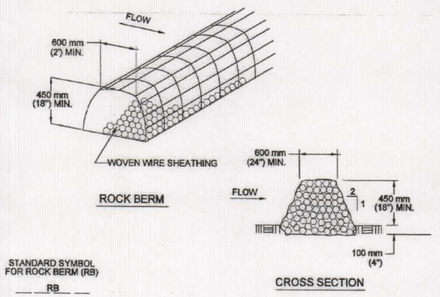
GENERAL NOTES
1. DIKES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT DIKE.
2. THE FABRIC COVER AND SKIRT SHALL BE A CONTINUOUS WRAPPING OF GEOTEXTILE. THE SKIRT SHALL BE A CONTINUOUS EXTENSION OF THE FABRIC ON THE UPSTREAM FACE.
3. THE SKIRT SHALL BE WEIGHTED WITH A CONTINUOUS LAYER OF 75-125 mm (3-5") OPEN GRADED ROCK OR TOED-IN 150 mm (6") WITH MECHANICALLY COMPACTED MATERIAL. OTHERWISE, THE ENTIRE STRUCTURE SHALL BE TRENCHED IN 100 mm (4").
4. DIKES AND SKIRT SHALL BE SECURELY ANCHORED IN PLACE USING 150 mm (6") WIRE STAPLES ON 600 mm (2') CENTERS ON BOTH EDGES AND SKIRT, OR STAKE USING 10W (¾") DIAMETER RE-BAR WITH TEE ENDS.
5. FILTER MATERIAL SHALL BE LAPPED OVER ENDS 150 mm (6") TO COVER DIKE TO DIKE JOINTS. JOINTS SHALL BE FASTENED WITH GALVANIZED SHOAT RINGS.
6. THE DIKE STRUCTURE SHALL BE MM40-150 mmX150 mm (6 GA. 6"X6") WIRE MESH, 450 mm (18") ON A SIDE.
7. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
8. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150 mm (6") AND DISPOSED OF IN A MANNER WHICH WILL NOT CAUSE ADDITIONAL SILTATION.
9. AFTER THE DEVELOPMENT SITE IS COMPLETLY STABILIZED, THE DIKES AND ANY REMAINING SILT SHALL BE REMOVED. SILT SHALL BE DISPOSED OF AS INDICATED IN GENERAL NOTE 8 ABOVE.

CITY OF AUSTIN, WATERSHED PROTECTION DEPARTMENT	TRIANGULAR SEDIMENT FILTER DIKE	
ADOPTED 3-27-00	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 628S



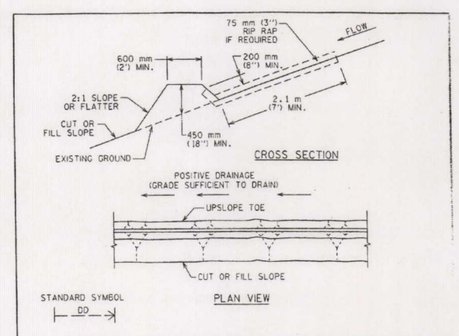
GENERAL NOTES :
1. ALL DIKES SHALL BE MACHINE COMPACTED.
2. ALL DIVERSION DIKES SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
3. a. DIVERTED RUNOFF FROM A PROTECTED OR STABILIZED AREA SHALL HAVE ITS OUTLET FLOW DIRECTED TO AN UNDISTURBED STABILIZED AREA OR INTO A LEVEL SPREADER OR GRADE STABILIZATION STRUCTURE.
b. DIVERTED RUNOFF FROM A DISTURBED OR EXPOSED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE, SUCH AS A ROCK BERM, BRUSH BERM, STONE OUTLET STRUCTURE, SEDIMENT TRAP OR SEDIMENT BASIN OR TO AN AREA PROTECTED BY ANY OF THESE PRACTICES.
4. UNLESS OTHERWISE SPECIFIED, EROSION STABILIZATION SHALL BE OPEN GRADED ROCK 75-125 mm (3-5") IN DIAMETER PLACED IN A 75 mm (3") THICK LAYER AND EMBEDDED INTO THE SOIL.
5. INSPECTION SHALL BE CONDUCTED WEEKLY OR AFTER EACH RAINFALL EVENT.

CITY OF AUSTIN, WATERSHED PROTECTION DEPARTMENT	INTERCEPTOR DIKE	
ADOPTED 3-27-00	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 630S-1



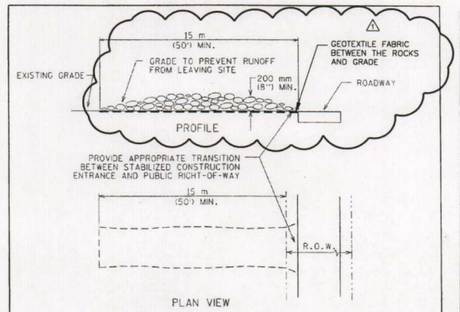
NOTES:
1. USE ONLY OPEN GRADED ROCK 75 to 125 mm (3 to 5") DIAMETER FOR ALL CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 25 mm (1") OPENING AND MINIMUM WIRE DIAMETER OF 12.9 mm (20 GAUGE).
3. THE ROCK BERM SHALL BE INSPECTED DAILY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SEDIMENT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. IF SEDIMENT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR 150 mm (6"), WHICHEVER IS LESS, THE SEDIMENT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SEDIMENTION PROBLEM.
5. WHEN THE SITE IS COMPLETELY STABILIZED,THE BERM AND ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

CITY OF AUSTIN, WATERSHED PROTECTION DEPARTMENT	ROCK BERM	
8/24/2010 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 639S-1



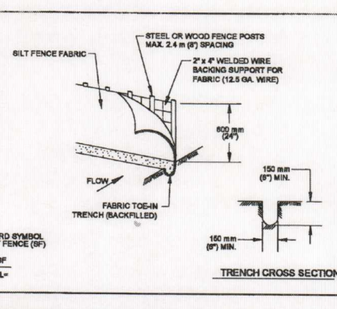
GENERAL NOTES :
1. ALL DIKES SHALL BE MACHINE COMPACTED.
2. ALL DIVERSION DIKES SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
3. a. DIVERTED RUNOFF FROM A PROTECTED OR STABILIZED AREA SHALL HAVE ITS OUTLET FLOW DIRECTED TO AN UNDISTURBED STABILIZED AREA OR INTO A LEVEL SPREADER OR GRADE STABILIZATION STRUCTURE.
b. DIVERTED RUNOFF FROM A DISTURBED OR EXPOSED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE, SUCH AS A ROCK BERM, BRUSH BERM, STONE OUTLET STRUCTURE, SEDIMENT TRAP OR SEDIMENT BASIN OR TO AN AREA PROTECTED BY ANY OF THESE PRACTICES.
4. UNLESS OTHERWISE SPECIFIED, EROSION STABILIZATION SHALL BE OPEN GRADED ROCK 75 TO 125 mm (3 TO 5 inches) IN DIAMETER EMBEDDED IN SOIL SURFACE.
5. INSPECTION SHALL BE CONDUCTED WEEKLY OR AFTER EACH RAINFALL EVENT.

CITY OF AUSTIN, WATERSHED PROTECTION DEPARTMENT	DIVERSION DIKE	
ADOPTED 3-27-00	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 622S-1



NOTES:
1. STONE SIZE: 75-125 mm (3-5") OPEN GRADED ROCK.
2. LENGTH: AS EFFECTIVE BUT NOT LESS THAN 15 m (50').
3. THICKNESS: NOT LESS THAN 200 mm (8").
4. WIDTH: NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS/EGRESS.
5. WASHING: WHEN NECESSARY, VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE AND DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
6. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AS WELL AS REPAIR AND CLEAN OUT OF ANY MEASURE DEVICES USED TO TRAP SEDIMENT. ALL SEDIMENTS THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
7. DRAINAGE: ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

CITY OF AUSTIN, WATERSHED PROTECTION DEPARTMENT	STABILIZED CONSTRUCTION ENTRANCE	
5/23/06 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 641S-1



1. STEEL OR WOOD POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 300 mm (12 INCHES). IF WOOD POSTS CANNOT ACHIEVE 300 mm (12 inches) DEPTH, USE STEEL POSTS.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH MUST BE A MINIMUM OF 150 mm (6 inches) DEEP AND 150 mm (6 inches) WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE FABRIC SHOULD BE SECURELY FASTENED TO EACH STEEL OR WOOD SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL OR WOOD FENCE POST.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150 mm (6 inches). THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.

CITY OF AUSTIN, WATERSHED PROTECTION DEPARTMENT	SILT FENCE	
9/1/2011 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S-1

⚠ REVISED BY AMEC, 11-6-2014.

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED PROFESSIONAL ENGINEER
11-6-2014

NO.	DATE	REVISION	APPRVD BY
⚠	11-6-2014	ADDED GEOTEXTILE FABRIC TO DETAIL 641S-1	RBL

Pedernales Electric Cooperative, Inc.
Purgatory Road Substation

CONSTRUCTION DETAILS - TEMPORARY STORM WATER BMPs

Comal County, Texas

By: RJR-K2 | Date: 10-8-2014 | Project No. -

amec

Sheet 0600 F-7

Ltr.	Date	Revision	By	Chkd.	Appd.

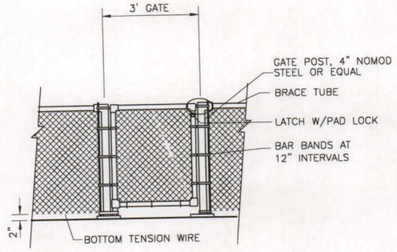
DRAWN K2-RR
CHECKED RBL
APPROVED RBL

PEDERNALES ELECTRIC COOPERATIVE, INC.
JOHNSON CITY, TEXAS
PURGATORY ROAD SUBSTATION

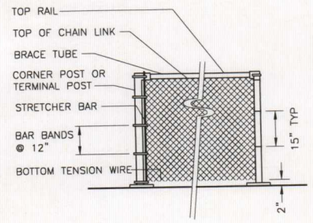
CONSTRUCTION DETAILS - TEMPORARY STORM WATER BMPs

DATE 10-8-2014
SCALE AS-NOTED
DWG. NO. 2-S-189-C-10

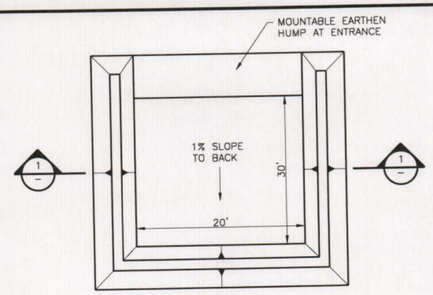
Plot Date: 11/06/14 - 5:22pm, Plotted by: roodj
Drawing Path: K:\ACAD\Clients\AMEC\Purgatory Rd Geo Assessment\, Drawing Name: C-ZD-DT101.dwg



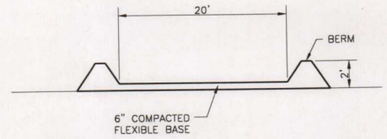
CHAIN LINK FENCE GATE
DETAIL A
NTS



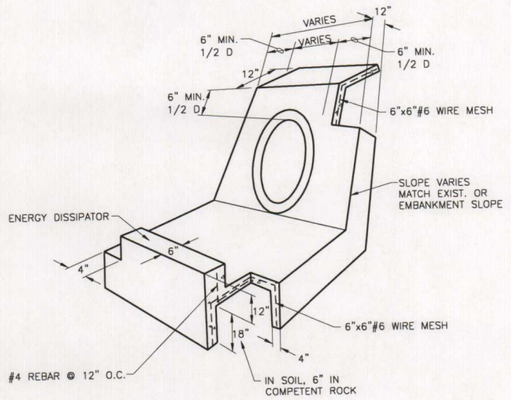
CHAIN LINK FENCE
DETAIL B
NTS



TEMPORARY FUELING PAD WITH BERM
DETAIL C
NTS

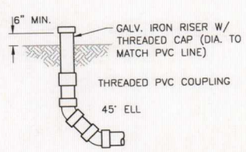


TEMPORARY FUELING PAD WITH BERM
SECTION 1
NTS



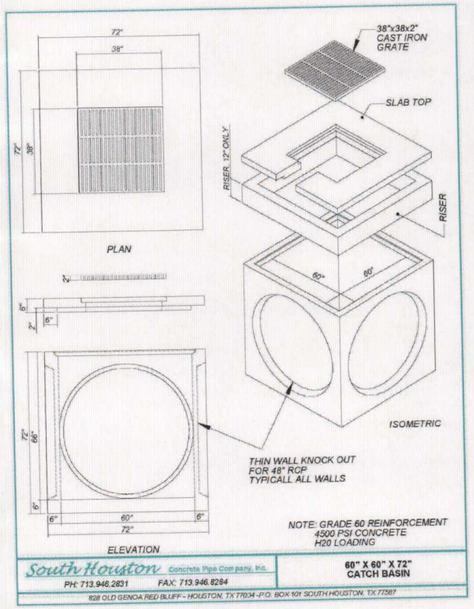
NOTE: TRIM PIPE FLUSH WITH CONCRETE.

OUTLET DETAIL
DETAIL D
NTS

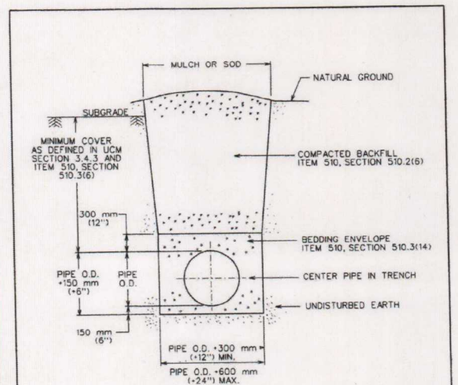


CLEANOUT
DETAIL E
NTS

FILTER POND UNDERDRAIN
DETAIL F
NTS



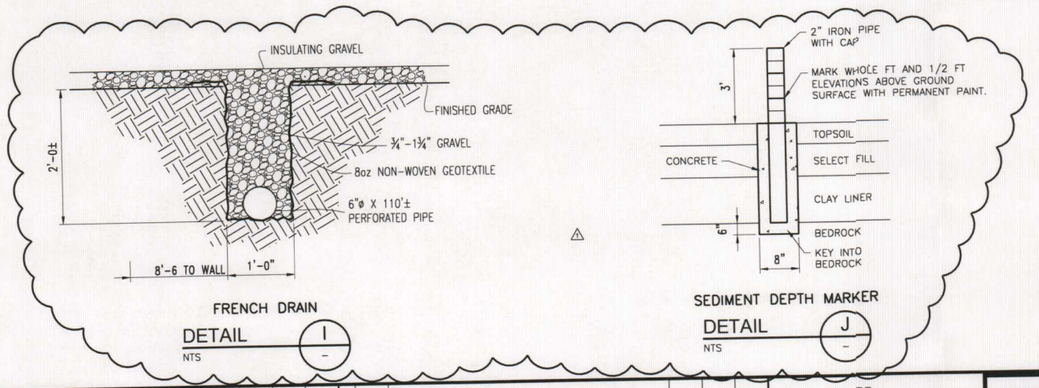
CATCH BASIN
DETAIL G
NTS



REFERENCES:
1. UTILITY CRITERIA MANUAL SECTION 3.4.3, "FINAL DESIGN"
2. STANDARD SPECIFICATION MANUAL ITEM 510,
SECTION 510.2(6), "SELECT BACKFILL OR BORROW";
SECTION 510.3(6), "TRENCH DEPTH AND DEPTH OF COVER";
SECTION 510.3(14), "PIPE BEDDING ENVELOPE"

CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS	TYPICAL TRENCH DETAIL WITH UNFINISHED SURFACE
Bee Armstrong 3/13/06 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. STANDARD NO. 510S-5

TYPICAL TRENCH DETAIL
DETAIL H
NTS



FRENCH DRAIN
DETAIL I
NTS

SEDIMENT DEPTH MARKER
DETAIL J
NTS

STATE OF TEXAS
R. BROCK LANGLEY
77001
LICENSED PROFESSIONAL ENGINEER
R. Brock Langley
11-6-2014

NO.	DATE	REVISION	APPRVD BY
1	11-6-2014	ADDED DETAILS I & J	RBL

Pedernales Electric Cooperative, Inc.
Purgatory Road Substation

CONSTRUCTION DETAILS

Comal County, Texas

By: RJR-K2 | Date: 10-8-2014 | Project No. -

amec

Sheet 0600 F-8

Ltr.	Date	Revision	By	Chkd.	Appd.

DRAWN K2–RR
CHECKED RBL
APPROVED RBL

PEDERNALES ELECTRIC COOPERATIVE, INC.
JOHNSON CITY, TEXAS
PURGATORY ROAD SUBSTATION

CONSTRUCTION DETAILS

DATE 10–8–2014
SCALE AS–NOTED
DWG. NO. 2-S-189-C-11

Plot Date - 11/06/14 - 3:41pm, Plotted by: rondfj
Drawing Path: K:\ACAD\Clients\AMEC\Purgatory Rd Geo Assessment_Drawing Name - C-ZD-DT101.dwg

LEGAL DESCRIPTION

BEING LOT 2A1, BLOCK 1, OUT OF THE SUBDIVISION PLAT ESTABLISHING OAKRUN COMMERCIAL RESERVE 2 OF RECORD IN VOLUME 14, PAGE 207 OF THE PLAT RECORDS OF COMAL COUNTY, TEXAS.

BENCHMARKS

BM1: SQUARE 'X' ON CONCRETE CURB OF INLET ±103 L.F. SOUTH EAST FROM THE SOUTH WEST CORNER OF LOT 2A1 AT ELEVATION = 830.36' SET BY KFW SURVEYING.

BM2: SQUARE 'X' ON CONCRETE CURB ±36 L.F. SOUTH FROM THE SOUTH EAST CORNER OF LOT 2A1 AT ELEVATION = 842.12' SET BY KFW SURVEYING.

COORDINATION NOTE:

1. CONTACT TWC (TIME WARNER CABLE) TO COORDINATE CABLE TV SERVICE. (210)-244-0500 OR QWEST COMMUNICATIONS AT 1-877-744-4416.

2. CONDUIT FOR ELECTRICAL SERVICE. CONFIRM REQUIREMENTS AND COORDINATE WITH NBU FOR INSPECTION.

3. CONTACT AT&T TO COORDINATE TELEPHONE SERVICE. 1-800-449-7928.

4. CONTRACTOR TO COORDINATE WITH NBU PRIOR TO CONSTRUCTION TO PLAN ELECTRIC SERVICE.

5. CONTRACTOR TO COORDINATE WITH NBU TO PLAN WATER AND SANITARY SEWER SERVICES.

6. CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.

CAUTION!!: THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION.THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

NOTE:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.

2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING.

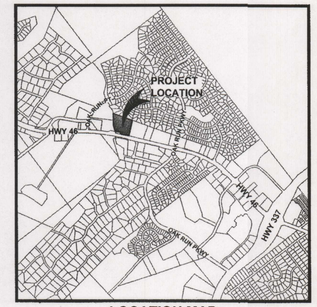
3. ALL EARTHEN CHANNELS MUST NOT EXCEED 3:1 SIDE SLOPES (MAX).

4.BATCH DETENTION SIDE SLOPES TO BE VEGATED BY SEEDING OR SODDING.

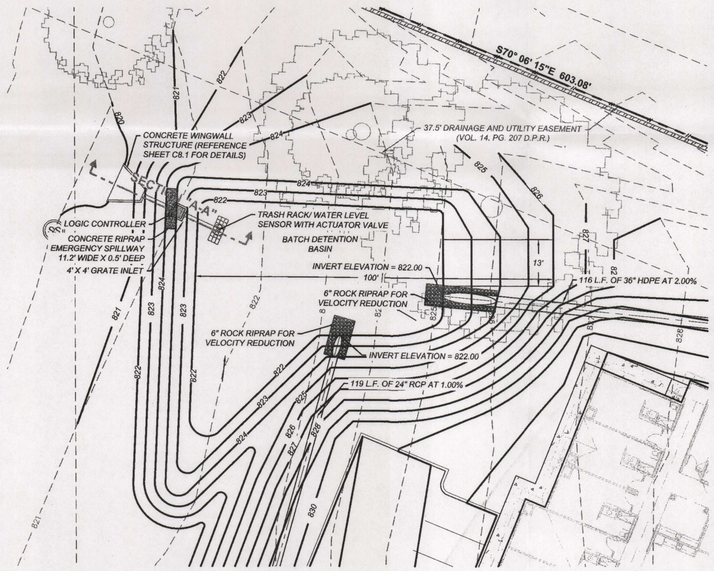
5. VALVE TO BE EQUIPPED WITH MANUAL OPENING CAPABILITY.

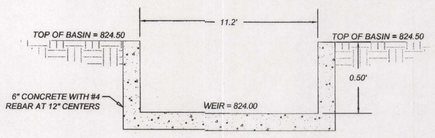
6. VALVE TO BE IN CLOSED POSITION AT ALL TIMES BETWEEN STORM EVENTS.

7. LOGIC CONTROLLER TO OPEN VALVE 12 HOURS (BY SIGNALING ACTUATOR TO TURN VALVE INTO FULLY OPEN POSITION) AFTER FIRST RAINFALL READING BY WATER LEVEL SENSOR.



LOCATION MAP
NOT TO SCALE





EMERGENCY OVERFLOW WEIR
NOT-TO-SCALE

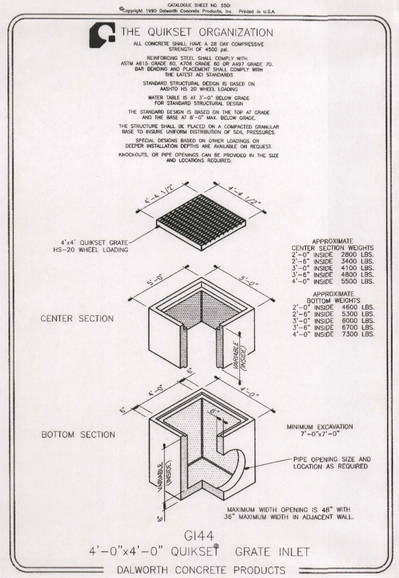
SCALE: 1" = 20'

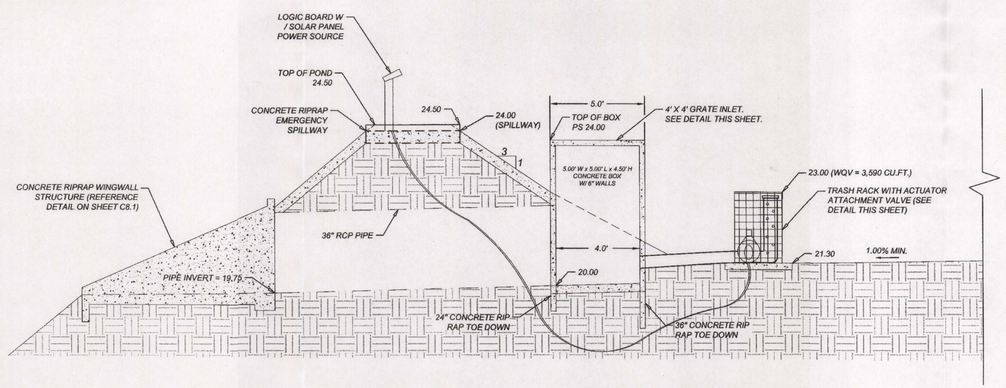
0' 20' 60'

40'

LEGEND

PROPERTY LINE	
ADJACENT PROPERTY LINE	
EXISTING CONCRETE	
EXISTING CURB	
PROPOSED SIDEWALK	
PROPOSED CURB	
PROPOSED RIBBON CURB	
EXISTING SANITARY SEWER MANHOLE	(S)
EXISTING FENCE	
EXISTING SPOT ELEVATION	+830.00
FLOW ARROW	
PROPOSED CONTOURS	830
PROPOSED DRAINAGE SWALE	
PROPOSED HIGH POINT	HIGH POINT
EXISTING CONTOURS	830
EXISTING TREE, REFERENCE LANDSCAPE PLANS FOR TREE PRESERVATION AND TREE REMOVAL	





CROSS SECTION "A-A"
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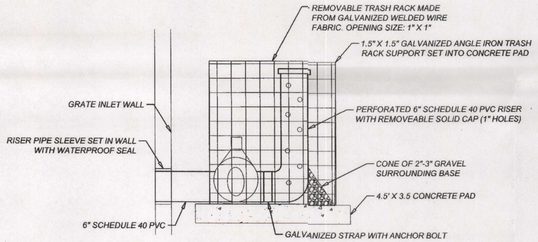
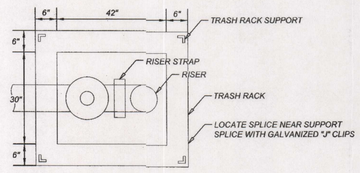


SIDE VIEW OF RISER



TOP VIEW OF RISER (SQUARE DESIGN)

RISER PIPE DETAIL
NOT-TO-SCALE

"RECEIVED TCEQ" SAN ANTONIO REGION
2014 OCT 29 PM 3:58

RECEIVED
NOV 20 2014
COUNTY ENGINEER

Comal County

KFW ENGINEERS & SURVEYING
FIRM# 9513
14603 HUEBNER ROAD, BUILDING 40
SAN ANTONIO, TEXAS 78230
PHONE (210) 979-8444
FAX (210) 979-8441

NO.	REVISION / ISSUE	DATE

STATE OF TEXAS
BENJAMIN O. BUNKER
108512
LICENSED
PROFESSIONAL ENGINEER
10/29/2014

MEMORY CARE AMERICA
2022 STATE HWY 46 W., NEW BRAUNFELS, TEXAS
BATCH DETENTION POND PLAN/DETAILS

JOB NO. 358-01-01
DATE: OCTOBER 2014
DRAWN: AB CHECKED: BB

SHEET NUMBER:

C6.2

Date: Oct 29, 2014, 8:15am User ID: dbustillos
File: P:\358\01\01\Design\Civil\C6.2 (BATCH DETENTION POND 358O101).dwg

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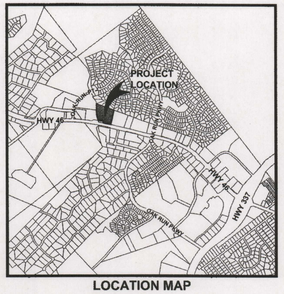

LOCATION MAP
NOT TO SCALE

Proposed/Ultimate Peak Runoff			
DRAINAGE AREA	DURATION	ACRES	Q (CFS)
1	2 YEAR	7.734	31.4
	10 YEAR		59.5
	25 YEAR		75.8
	100 YEAR		106.1
2	2 YEAR	2.262	3.9
	10 YEAR		9.5
	25 YEAR		12.8
	100 YEAR		19.0

LEGEND

PROPERTY LINE

DRAINAGE AREA

EXISTING CONTOUR

Tc FLOW PATH

PROPOSED CONTOUR

SCALE: 1" = 50'

0 50' 150'

100'

RECEIVED
NOV 20 2014
COUNTY ENGINEER

Comal County

KFW ENGINEERS & SURVEYING
PHONE (210) 979-8444
FAX (210) 979-8441
FIRM# 9513
14603 HUEBNER RD, BLDG. 40
SAN ANTONIO, TEXAS 78230

ISSUE DATE

REVISIONS

STATE OF TEXAS
BENJAMIN D. BUNKER
128512
LICENSED
PROFESSIONAL ENGINEER
10/29/2014

OAKRUN COMMERCIAL RESERVE 2

DRAINAGE AREA MAP
PROPOSED/ULTIMATE CONDITIONS

JOB NO. 358-01-01
DATE: OCTOBER 2014
DRAWN: JS CHECKED: BB

SHEET NUMBER:

EX-3B

Date: Oct 29, 2014, 9:59am User ID: jspencer
File: P:\358\01\03\Design\Exhibits\WPAP\ Proposed_Ultimate Drainage Map.dwg

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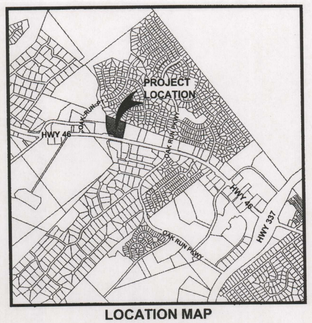

LOCATION MAP
NOT TO SCALE

Existing Peak Runoff			
DRAINAGE AREA	DURATION	ACRES	Q (CFS)
1	2 YEAR	7.734	12.0
	10 YEAR		29.1
	25 YEAR		39.2
	100 YEAR		57.9
2	2 YEAR	2.262	3.9
	10 YEAR		9.5
	25 YEAR		12.8
	100 YEAR		19.0

LEGEND

PROPERTY LINE

DRAINAGE AREA

EXISTING CONTOUR

Tc FLOW PATH

SCALE: 1" = 50'

0 50' 150'

100'

KFW ENGINEERS & SURVEYING
FIRM# 9513
14803 HUEBNER RD, BLDG. 40
SAN ANTONIO, TEXAS 78230
PHONE (210) 979-8444
FAX (210) 979-8441

ISSUE DATE

REVISIONS

STATE OF TEXAS
BENJAMIN D. BUNKER
108512
LICENSED
PROFESSIONAL ENGINEER
10/29/2014

RECEIVED
NOV 20 2014
COUNTY ENGINEER

"RESEARCH TOE SAN ANTONIO"
2014 OCT 29 PM 1:56

Comal County

OAKRUN COMMERCIAL RESERVE 2

DRAINAGE AREA MAP
EXISTING CONDITIONS

JOB NO. 358-01-01
DATE: OCTOBER 2014
DRAWN: JS CHECKED: BB

SHEET NUMBER:

EX-3A

Date: Oct 29, 2014, 9:56am User ID: Jspencer
File: P:\358\01\01\Design\Exhibits\WPAP\WPAP Existing Drainage Map.dwg

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LEGAL DESCRIPTION

BEING LOT 2A1, BLOCK 1, OUT OF THE SUBDIVISION PLAT ESTABLISHING OAKRUN COMMERCIAL RESERVE 2 OF RECORD IN VOLUME 14, PAGE 207 OF THE PLAT RECORDS OF COMAL COUNTY, TEXAS.

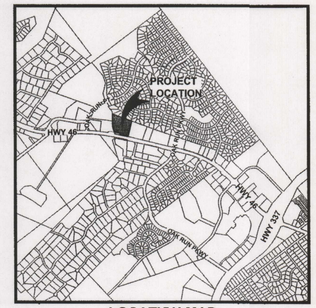
BENCHMARKS

BM1: SQUARE 'X' ON CONCRETE CURB OF INLET ±103 L.F. SOUTH EAST FROM THE SOUTH WEST CORNER OF LOT 2A1 AT ELEVATION = 830.36' SET BY KFW SURVEYING.

BM2: SQUARE 'X' ON CONCRETE CURB ±36 L.F. SOUTH FROM THE SOUTH EAST CORNER OF LOT 2A1 AT ELEVATION = 842.12' SET BY KFW SURVEYING.

CURVE TABLE					
CURVE #	LENGTH	RADIUS	CHORD	CHORD BEARING	TANGENT
C1	148.79	5828.27	148.79	N79° 01' 25"W	74.40
C2	54.67	200.00	54.50	S10° 19' 13"E	27.51

BEST MANAGEMENT PRACTICES DURING DROUGHT CONDITIONS:
IN ARID AREAS (AREAS WITH AN AVERAGE RAINFALL OF 0-10 INCHES), SEMIARID AREAS (AREAS WITH AN AVERAGE ANNUAL RAINFALL OF 10 TO 20 INCHES), AND AREAS EXPERIENCING DROUGHTS WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED IS PRECLUDED BY SEASONABLY ARID CONDITIONS, STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICAL. FOR INTERIM STABILIZATION DURING DROUGHT CONDITIONS BEST MANAGEMENT PRACTICES WILL BE IMPLEMENTED. THESE MAY INCLUDE BUT ARE NOT LIMITED TO GEOTEXTILE BLANKETS AND MATTING, HYDROMULCH, DIVERSION STRUCTURES AND/OR STRUCTURAL CONTROLS SUCH AS SILT FENCE AND ROCK BERMS. THESE BMPS ARE TO BE MAINTAINED IN ACCORDANCE WITH THE INSPECTION/MAINTENANCE SCHEDULE PROVIDED IN ATTACHMENT OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP)).



LOCATION MAP
NOT TO SCALE

COORDINATION NOTE:

1. CONTACT TWC (TIME WARNER CABLE) TO COORDINATE CABLE TV SERVICE. (210)-244-0500 OR QWEST COMMUNICATIONS AT 1-877-744-4416.

2. CONDUIT FOR ELECTRICAL SERVICE. CONFIRM REQUIREMENTS AND COORDINATE WITH NBU FOR INSPECTION.

3. CONTACT AT&T TO COORDINATE TELEPHONE SERVICE. 1-800-449-7928.

4. CONTRACTOR TO COORDINATE WITH NBU PRIOR TO CONSTRUCTION TO PLAN ELECTRIC SERVICE.

5. CONTRACTOR TO COORDINATE WITH NBU TO PLAN WATER AND SANITARY SEWER SERVICES.

6. CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.

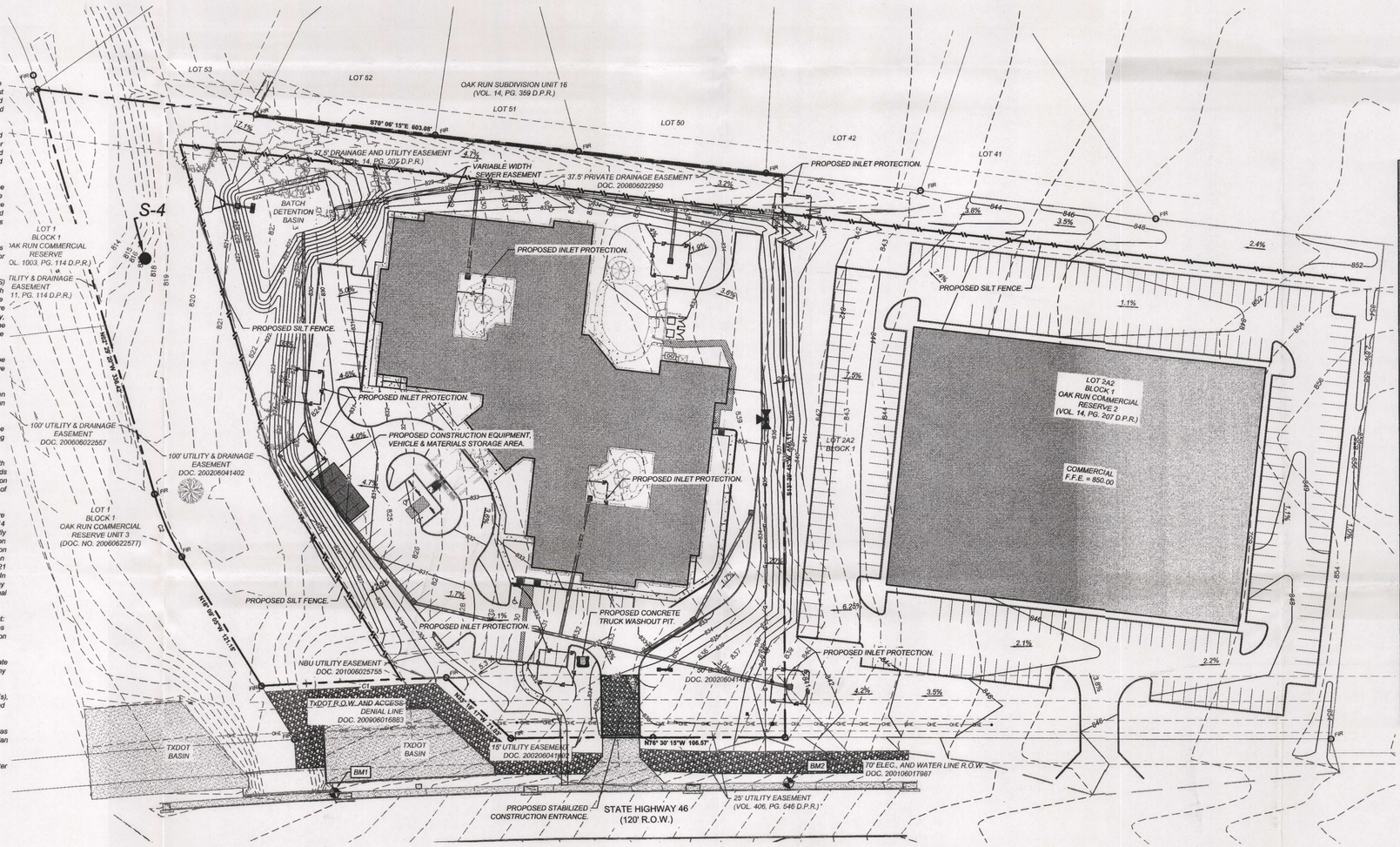
TCEQ-0592 (Rev. 3/15/07)
Texas Commission on Environmental Quality
Water Pollution Abatement Plan
General Construction Notes

1. *Written construction notification must be given to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. Information must include the date on which the regulated activity will commence, the name of the approved plan for the regulated activity, and the name of the prime contractor and the name and telephone number of the contact person.*
2. *All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.*
3. *If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive feature may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.*
4. *No temporary aboveground hydrocarbon and hazardous substance storage tank system is installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.*
5. *Prior to commencement of construction, all temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.*
6. *If sediment escapes the construction site, off site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).*
7. *Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.*
8. *Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).*
9. *All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.*
10. *Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.*
11. *The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.*
12. *The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:*
    - A. *any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;*
    - B. *any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;*
    - C. *any development of land previously identified as undeveloped in the original water pollution abatement plan.*

Austin Regional Office
2800 S. IH 35, Suite 100
Austin, Texas 78704-5712
Phone(512) 339-2929
Fax (512) 339-3795

San Antonio Regional Office
14250 Judson Road
San Antonio, Texas 78233-4480
Phone(210) 490-3096
Fax (210) 545-4329

FLOOD PLAIN NOTE:
NONE OF THIS SITE IS WITHIN THE FEMA 100-YEAR FLOODPLAIN ACCORDING TO MAP PANEL 435 OF 505, DATED SEPTEMBER 2, 2009



LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- EXISTING CONCRETE
- EXISTING CURB
- PROPOSED SIDEWALK
- PROPOSED CURB
- PROPOSED RIBBON CURB
- EDGE OF SOIL DISTURBANCE
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVES
- EXISTING SANITARY SEWER MANHOLE
- EXISTING SIGN
- EXISTING OVERHEAD UTILITY AND POWER POLE
- SITE BENCHMARK SEE DESCRIPTION THIS SHEET
- EXISTING FENCE
- FLOW ARROW
- PROPOSED CONTOURS (850)
- PROPOSED INLET PROTECTION
- PROPOSED SILT FENCE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.
- PROPOSED CONCRETE TRUCK WASHOUT PIT

NOTE:
LOT 2A2 TO BE DEVELOPED WITH UP TO 85% IMPERVIOUS COVER.

NOTE:
S-4 IS A SENSITIVE STREAMBED FEATURE.

SCALE : 1"=50'

0' 50' 150'

100'

RECEIVED
NOV 20 2014
COUNTY ENGINEER
Comal County

RECEIVED TCEQ SAN ANTONIO REGION 2014 OCT 29 PM 3:56

KFW ENGINEERS & SURVEYING
14603 HUEBNER ROAD, BUILDING 40
SAN ANTONIO, TEXAS 78230
PHONE (210) 979-8444
FAX (210) 979-8441
FIRM# 9513

NO.	REVISION / ISSUE	DATE

STATE OF TEXAS
BENJAMIN J. BUNKER
105512
LICENSED
PROFESSIONAL ENGINEER
10/24/2014

OAKRUN COMMERCIAL RESERVE 2

OVERALL SITE PLAN

JOB NO. 358-01-01
DATE: AUGUST 2014
DRAWN: JS CHECKED: BB

SHEET NUMBER:

EX-1

Date: Oct 29, 2014, 9:30am User ID: jbeamer
File: P:\358 (01 (01 \Design\Exhibits\WPAP SITE PLAN.dwg

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